DATA GAP REPORT AND REMEDIAL INVESTIGATION WORK PLAN

Sundberg Gravel Pit

Prepared for: Green Cove Park LLC

Project No. 210577 • June 1, 2023 PUBLIC-REVIEW DRAFT

earth + water

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Acronyms

AEG	Associated Environmental Group, LLC
AMEC	AMEC Earth & Environmental
Aspect	Aspect Consulting, LLC
AST	aboveground storage tank
bgs	below ground surface
BETX	benzene, ethylbenzene, toluene, and xylenes
CARA	Critical Aquifer Recharge Area
CLARC	Cleanup Levels and Risk Calculation
COPC	constituent of potential concern
cPAH	carcinogenic PAH
CSM	conceptual site model
DWPA	Drinking Water Protection Area
Ecology	Washington Department of Ecology
ENPRO	ENPRO Environmental
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
LEL	lower explosive limit
LiDAR	light detection and ranging
mg/kg	milligrams/kilograms
mg/L	milligrams per liter
µg/L	micrograms per liter
msl	mean sea level
MTCA	Model Toxics Control Act
mV	millivolts
NAVD88	North American Vertical Datum 1988
ORP	oxidation-reduction potential
Pacific Rim	Pacific Rim Soil & Water
PAH	polycyclic aromatic hydrocarbon

PCB	polychlorinated biphenyl
PCP	pentachlorophenol
PID	photoionization detector
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RLI	Residential Low Impact
RI	Remedial Investigation
RNS	Robinson, Noble & Saltbush, Inc.
SAP	Sampling and Analysis Plan
SVOC	semivolatile organic compound
SMS	Sediment Management Standards
Soundview	Soundview Consultants LLC
Stemen	Stemen Environmental, Inc.
TAL	Target Analyte List
TEE	terrestrial ecological evaluation
TEQ	toxic equivalent concentration
TPH	total petroleum hydrocarbons
TPH-D+O	total diesel-range extended petroleum hydrocarbons
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound
WAC	Washington Administrative Code
WRIA	Water Resource Inventory Area

1 Introduction

This Data Gap Report and Remedial Investigation Work Plan (RI Work Plan) presents existing information and data for the Sundberg Gravel Pit, generally located at 2200 Cooper Point Road NW in Olympia, Washington (Subject Property; Figure 1), to identify data gaps and outline the objectives and scope of work to complete the Remedial Investigation (RI) for the Site. The “Site” is defined by any area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located (Revised Code of Washington [RCW] 70A.305.020(8)). The RI will define the extent of the Site that is associated with historical operations at the Subject Property.

The Data Gap Report and RI Work Plan has been prepared as an attachment to Agreed Order No. DEXXXX (Agreed Order) between the Washington State Department of Ecology (Ecology) and Green Cove Park LLC. The purpose of the RI is to meet the requirements of Washington Administrative Code (WAC) 173-340-350(7) and WAC 173-204-550 to determine the nature and extent of contamination exceeding Model Toxics Control Act (MTCA) cleanup levels, Sediment Management Standards (SMS), and other applicable regulatory requirements.

1.1 Report Organization

This report is organized as follows.

- Section 2 presents a description of the Subject Property, including the location, history, and current and likely future land use.
- Section 3 describes the environmental setting of the Subject Property, including topography, geology, and hydrogeology, and a discussion of sensitive receptors on or near the Subject Property.
- Section 4 provides a comprehensive description of the previous investigations conducted to date at the Subject Property, and a summary of existing data.
- Section 5 describes the preliminary conceptual site model (CSM), including sources and constituents of potential concern (COPCs), and the potential exposure pathways and receptors.
- Section 6 presents the existing data gaps in the site characterization.
- Section 7 presents the RI work plan to address the data gaps identified in Section 6.
- Section 8 presents an estimate schedule for implementation of this Work Plan.
- Section 9 presents the references used in the preparation of this document.

Several appendices provide additional information:

- Appendix A Sampling and Analysis Plan

- Appendix B Previous Boring Logs
- Appendix C Initial Draft RI Report – V.1 (ENPRO, 2021)
- Appendix D Report Limitations and Guidelines for Use

2 Project Location and History

This section describes the project location, Subject Property history, and current and potential future land use.

2.1 Project Location and Description

The Subject Property is currently vacant, undeveloped land, covered by shrub vegetation and trees (Figure 2). The Subject Property consists of 12 Thurston County tax parcels that together comprise approximately 53 acres of land located within the city of Olympia in Thurston County (Table 1, below). The majority of the Subject Property is zoned Residential Low Impact[1] (RLI) by the City of Olympia; the northeastern-most parcels are zoned Residential 4–8 Units per Acre[2] (R-4-8) (Olympia, 2020).

Table 1. Subject Property Parcel Information

Tax Parcel No	Size (Acres)
81700000000 (Parcel A)	27.4
74202900000 (Parcel B)	6.79
74202500200 (Parcel C)	4.66
74202500100	7.27
50400100100	1.62
50400200100	1.5
50400300100	1.63
50400400100	1.1
50400402000	0.06
50400402100	0.11
50400402300	0.11
50400402500	0.24
Total Subject Property Area	52.49

[1] Residential development within sensitive drainage basins at densities averaging from two (2) to four (4) units per acre.
[2] Residential development at densities ranging from a minimum of four (4) units per acre to a maximum of eight (8) units per acre.

The Subject Property is bound to the west by Cooper Point Road, beyond which is undeveloped, vacant forest land, and to the north, east, and south by rural residential properties, some of which are developed with single-family residences, but many are undeveloped.

Not including wetlands on the Subject Property (which are discussed in Section 3.3), the nearest surface water bodies are a small tributary to Green Cove Creek, located approximately 1,200 feet northwest of the Subject Property, and Kaufman Pond, located approximately 1,300 feet north-northeast of the Subject Property. Budd Inlet of the Puget Sound is located approximately 3,300 feet east of the Subject Property (Figure 3).

2.2 Subject Property History

The largest tax parcel, herein referred to as Parcel A (Figure 2), along with adjoining portions of Parcels B and C, were used for intermittent sand and gravel mining beginning in approximately 1960 through the 1990s (AMEC, 2004; ENPRO, 2020). Although there are no available records, based on the observed fill conditions on the Subject Property, reclamation (filling of mined areas) appears to have also been intermittent, which is consistent with the requirements for segmental reclamation of surface mines (RCW 78.44.111).

Historical land disturbance – which herein refers to grading and filling activities and does not include vegetation clearing or logging – has been evaluated for the Subject Property using a variety of data and information sources, including light detection and ranging (LiDAR) and historical aerial photograph review. LiDAR is a remote sensing method that uses a pulsed laser to measure distances to the Earth's surface and, combined with other recorded data, generates precise, three-dimensional information about surface characteristics. LiDAR can collect elevation data in an area of dense vegetation where traditional photogrammetry fails to reveal the actual terrain surface due to dense cover. The estimated limits of historical land disturbance on the Subject Property are depicted on Figure 4. Portions of the subject Property outside of these limits of land disturbance are treed, forested areas that appear undisturbed in available historical documentation.

A series of historical aerial photographs are provided on Figures 5a and 5b to depict Subject Property conditions over time. A 1942 aerial photograph shows the Subject Property primarily vacant and covered in vegetation except for a small structure located in the south-central portion of the Subject Property. Some clearing is evident in the 1960 aerial photograph along with a small area of land disturbance to the west of the 1942 structure, which is still visible. This is consistent with historical documentation of gravel mining commencing on the Subject Property around 1960. The 1965 aerial photograph shows expansion of land disturbance to the west and north. The 1973 aerial photograph shows further expanded grading and land disturbance to the north along the western Subject Property boundary and log piles in the central portion of the Subject Property. The 1978 aerial photograph shows similar conditions with grading along the western Subject Property boundary and log-pile storage in the central portion.

The aerial photographs available for the Subject Property show that Parcel A was used between approximately 1976 and 1990 for log storage (AMEC, 2004). An oblique aerial photograph taken in 1976, as part of Ecology's coastal atlas program, shows rafted log storage in the foreground, presumably for use in sawmill operations located along the shoreline of Budd Inlet just outside of the photograph frame. The background of the aerial photograph shows log-pile storage on a portion of the Subject Property (Figure 6).

The 1990 aerial photograph shows reclamation along the western portion of the Subject Property, where previous aerial photographs showed evidence of grading. The small structure first observed in the 1942 aerial photograph is still present, and a new structure is shown in the southwest portion of the Subject Property. Log piles remain in the central portion of the Subject Property in the 1990 aerial photograph, but are fewer than previously depicted. Clearing is evident along the eastern Subject Property boundary in the 1990 aerial photograph. The 1990 aerial photograph also shows clearing and grading that appears to extend off the western portion of the Subject Property to the north. The 2003 aerial photograph shows the largest area of grading in the west-central portion of the Subject Property of any of the aerial photographs and is used to help determine the extent of land disturbance on the Subject Property (Figure 4). The small structure first seen in the 1942 aerial photograph is no longer present on the Subject Property in the 2003 aerial photograph. The aerial photographs dated between 2005 and 2018 show no evidence of additional land disturbance and depict similar conditions with vegetation growing over mined and reclaimed areas and a number of access roads and trails.

The 4.66-acre parcel, herein referred to as Parcel C with a past address of 2721 Park Street NW, was developed between 1983 and 1990 with a mobile home and garage. The potable water supply to the home was a private water supply well located on the same parcel. A septic system was also present on the parcel. During a site reconnaissance for a Phase I Environmental Site Assessment (ESA) in 2004, AMEC Earth & Environmental (AMEC) observed a 500-gallon aboveground storage tank (AST) used for storage of diesel fuel, and documented its condition as being ‘new and in good condition’ (AMEC, 2004). The Phase I ESA also identified the presence of approximately ten, 55-gallon drums of oil and drive train fluid located in and around the garage, and surface staining in the garage and north of the garage, where equipment and vehicles were parked. Each stained area measured approximately 6 feet by 6 feet (AMEC, 2004).

An underground storage tank (UST) is reported to have been historically located to the northeast of the mobile home (AMEC, 2004) on Parcel C. The UST was reported to have a 12,000-gallon capacity and be used for storage of diesel fuel for truck fueling. The UST was permanently decommissioned by removal by Stemen Environmental in 1993 (see Section 4.1 for more information).

2.3 Current and Future Land Use

The current land use for the Subject Property is mine reclamation. At the time of preparation of this document, there is no active gravel mining or other uses of the Subject Property for private or commercial purposes. The portions of the Subject Property that have been used historically for surface sand and gravel mining are being reclaimed in accordance with the Washington State Surface Mining Act, regulated under Chapter 332-18 WAC and RCW 78.44.

Future land use may include redevelopment for residential use.

3 Environmental Setting

The Subject Property's physical characteristics and its immediate vicinity are described in this section. After overviews of topography and surface drainage, the text provides a description of geologic and hydrogeologic conditions, groundwater use, and critical areas in the vicinity of the Subject Property.

3.1 Topography and Surface Drainage

The topography of the area is detailed on the U.S. Geological Survey (USGS) 7.5-minute topographic map Tumwater Quadrangle, Washington – Thurston County (USGS, 2022). The Subject Property is located on the Cooper Point Peninsula, which extends north into the saline waters of the Puget Sound. The peninsula is generally characterized as a low-lying glacial plain with a central topographic high of approximately 300 feet above mean sea level (msl) that terminates in steep bluffs at the shores of Puget Sound (USGS, 2022; Drost et al., 1998).

The Subject Property is located within the Deschutes Watershed (Water Resource Inventory Area [WRIA] 13; Soundview, 2020) and straddles the boundary between the Green Cove Creek Watershed on the south and the Butler Cove Watershed on the north (Figure 3). Green Cove Creek discharges to Eld Inlet on the northwest side of the Cooper Point Peninsula. Butler Creek discharges to Budd Inlet on the east side of the peninsula.

The topography of the Subject Property has been modified over time by sand and gravel mining, and the related filling associated with reclamation (Figure 7). As documented in an Ecology 2016 inspection report, the Subject Property has been graded to form a stormwater detention basin and there is no discharge of stormwater to a surface water of Washington State (Ecology, 2016).

3.2 Geology and Hydrogeology

The geology of the Greater Puget Sound region is characterized by glacially derived sediments, which were deposited during several episodes, concluding with the Vashon Stade of the Fraser Glaciation, which ended approximately 12,500 years ago. The advance of the Vashon glacier deepened and widened north-south trending valleys. Thick bodies of sand, gravel, and till were deposited over the area. With the retreat of the glacier, ice-contact stratified drift was deposited over much of the area, followed by a period of alluvial valley filling, peat deposition, minor erosion, and soil development (AMEC, 2004).

Glacial drift deposits in the Subject Property vicinity consist of two general types, recessional outwash (Qvr; moderately to well-sorted sands and gravels) and till (Qvt; unsorted sand, gravel, and boulders in a silt and clay matrix (Drost et al., 1999). The surficial geology of the Cooper Point Peninsula consists primarily of these two units. Shallow, unconfined groundwater is present in the recessional outwash (Qvr) in the Subject Property vicinity, and perched groundwater conditions (local zones of saturation above the regional water table) may exist because of the low permeability of the underlying glacial till (Drost et Al., 1998). However, few wells withdraw water from the Qvr because the unit is thin, or it lies above the water table and is unsaturated.

In the Subject Property vicinity, the Qvr is less than 25 feet thick (Drost et al., 1999). The thickness of Qvt, which is considered a confining unit between the overlying Qvr, where present, and the underlying advance outwash deposits (Qva), is mapped at more than 100 feet thick beneath the Subject Property (Drost et al., 1999).

Beneath these glacial drift deposits are advance outwash deposits (Qva; sand and subordinate gravel grading upward to well-rounded gravel in a sandy matrix interbedded with lenses of sand; Drost et al., 1999) overlying a fine-grained assemblage of clays and silt with minor amounts of sand, gravel, peat, and wood of the Kitsap Formation (Drost et al., 1998).

The Qva serve as a significant potable aquifer for the Subject Property region (Drost et al., 1999). The aquifer is confined between the underlying Kitsap Formation and the overlying glacial till and mapped to be more than 50 feet thick in the vicinity of the Subject Property. Groundwater within the Qva aquifer flows radially, from the central portion of the Cooper Point peninsula towards surface water of the Puget Sound on the west, north and east (Drost et al., 1999).

Native subsurface conditions at the Subject Property have been altered by historical sand and gravel mining and ongoing reclamation. Section 4 describes subsurface conditions observed at the Subject Property during previous investigations. In historically mined areas, which comprise the majority of the western portion of the Subject Property (Figure 4), much of the recessional outwash that overlies glacial till has been removed. On the eastern portion of the Subject Property, only a thin layer of recessional outwash overlies glacial till, and there is little to no disturbance of the native soils. Table 2 describes subsurface conditions documented in explorations completed previously by others. The thickness of fill, where present, ranges from a few inches to more than 15 feet and consists of reworked native soil, imported fill soil, woody debris, and construction debris that includes concrete, asphalt, rebar/metal debris, and milled timber. The subsurface observations, including thickness of fill and presence/absence of woody debris and construction debris, are provided on Figure 8.

3.3 Sensitive Receptor Evaluation

Soundview Consultants LLC (Soundview) investigated the Subject Property for potentially regulated wetlands, waterbodies, fish, and wildlife habitat and/or priority species in the fall of 2015. Five wetland areas were identified on the Subject Property (Soundview, 2020). The wetland areas are depicted on Figure 7. Wetlands A, B, and C are Category III wetlands with 140-foot standard buffers and wetlands D and E are Category IV wetlands with 50-foot standard buffers (Soundview, 2020). The primary source of wetland hydrology to wetlands A through D is likely a seasonally high groundwater table, direct precipitation, and surface runoff from adjacent uplands. Wetlands A, B and C discharge to stormwater ditches. Wetland D, which is more of an upland drainage swale than a wetland, is likely hydraulically connected to an adjacent sediment pond and discharges to the ground surface where water infiltrates into the underlying soils. Wetland E is located within a depression created by historical grading activities and drains via sheet flow across the surface to the south where water infiltrates into the underlying soils. The primary sources of wetland hydrology to Wetland E are a seasonally high groundwater table provided through hillside seeps and surface runoff from adjacent uplands.

No streams or other potentially regulated fish or wildlife habitat were identified on or near the Subject Property (Soundview, 2020). A study completed by EnviroVector evaluated the potential occurrence of steelhead trout, a federally listed species, within 1,000 feet of the Subject Property (EnviroVector, 2020b). The study concluded that no steelhead trout were identified or are expected to occur within 1,000 feet of the Subject Property.

Associated Environmental Group, LLC (AEG) evaluated potential impacts to sensitive receptors, including four wetland areas and two nearby drinking water supply wells, using the existing Subject Property soil and groundwater data (AEG, 2021a). AEG concluded that groundwater is not likely hydraulically connected to surface water in the wetlands—based on the depth to water measured in the wells—so that contaminants in groundwater are unlikely to impact sensitive receptors in the wetland areas (AEG, 2021a). This conclusion is inconsistent with the wetland hydrology interpreted by Soundview to include a seasonally high groundwater table for all five of the wetland areas (Soundview, 2020). In addition, groundwater elevations calculated based on water levels in the monitoring wells indicate that there is potential discharge of shallow groundwater to the wetlands. Groundwater elevations were calculated for water levels measured at the Subject Property in 2020 and 2021 to range from 232 feet North American Vertical Datum 1988 (NAVD88) to 242 feet NAVD88 (Table 7). Except for Wetland E, which is slightly higher in elevation, the ground surface of the wetland areas on the Subject Property is below 230 feet NAVD88 (Figure 7).

AEG also concluded that well logs for surrounding drinking water supply wells indicate static water levels at 149 feet below ground surface (bgs) and that there are not likely to be impacts to drinking water, based on the vertical separation distance between contaminants in shallow groundwater at the Subject Property and the potable groundwater zone.

3.4 Groundwater Use

The potable supply in the Subject Property vicinity is predominantly groundwater (Thurston County, 2022). The entire Cooper Point Peninsula is identified by Thurston County as a Critical Aquifer Recharge Area (CARA), which is an area overlying significant groundwater resources and susceptible to groundwater contamination (Thurston County, 2022). Most of the Subject Property is a Category II CARA, characterized by high aquifer sensitivity (Thurston County, 2022).

Earth Solutions NW, LLC (2016) indicates that the surface mining of the recessional outwash sands and gravels at the Subject Property has resulted in the removal of soil that would exhibit a high susceptibility to shallow interflow aquifer recharge and the underlying, low permeability glacial till prevents direct recharge to the Qva aquifer. They conclude that the historical mining and grading activities at the Subject Property have lowered the susceptibility to adversely impact CARA resources (Earth Solutions NW, 2016).

The City of Olympia further identifies Drinking Water Protection Areas (DWPAs) surrounding each of their water supply wells. The nearest city DWPA is the Kaiser Well DWPA, located approximately 5,200 feet from the Subject Property (Olympia, 2022). The nearest wellhead protection area is located 2,800 feet north of the Subject Property (Figure 3).

One private water supply well is located on the Subject Property, near the location of the former mobile home. The well is not currently in use and the water well log has not been located to determine the well construction detail. The current condition of the water supply well on the Subject Property will be evaluated and it may be decommissioned if concerns about its integrity or its location relative to contaminants in groundwater are identified during the RI.

4 Previous Investigations and Existing Data

The investigation work conducted to date at the Subject Property to evaluate subsurface conditions and assess potential threats to human health and the environment is summarized in the following sections. In addition to this work, there have been several geotechnical investigations and sensitive area surveys and assessments to support planning and permitting for future redevelopment of the Subject Property. Those investigations are not summarized herein, but relevant and applicable data and information is referenced in this document.

4.1 Stemen Interim Action – 1993

In 1993, Stemen Environmental, Inc. (Stemen) decommissioned a 12,000-gallon UST that had been used for the storage of diesel fuel. The UST had reportedly been out of use for 10 years and was decommissioned by permanent removal from the Subject Property. Three soil samples were collected from the limits of the excavation following UST removal at depths of 9 to 13 feet. The samples did not contain diesel-range total petroleum hydrocarbons (TPH) at concentrations exceeding the applicable cleanup levels and Ecology indicated that the excavation could be backfilled (Stemen, 1993).

The report documents that oil-stained soil observed around the fill pipe was segregated and stored in a separate stockpile (Stemen, 1993). One soil sample was collected from the stockpile, which contained an estimated total of 25 cubic yards of soil that contained visible staining and petroleum-like odors. The results identified diesel-range TPH at a concentration of 390 milligrams per kilogram (mg/kg), which exceeded the Ecology cleanup level at the time, but is below the current Ecology MTCA Method A soil cleanup level of 500 mg/kg for unrestricted land uses.

The stockpile is no longer evident on the Subject Property, and there is no available documentation regarding the final disposition of the stockpile. However, the concentrations of TPH detected in the stockpile soil in 1993 are below current Ecology cleanup levels.

Key Findings and Data Gaps: Although oil-stained soil was observed around the fill pipe above the former UST, soil samples collected around the UST at the time of its removal did not contain TPH above the MTCA Method A cleanup level of 500 mg/kg. Ecology's *Site Assessment Guidance for Underground Storage Tank Systems* (Ecology, 2022b) requires collection and analysis of groundwater samples when field screening indicates that a release may have occurred, and the UST system is within 2 feet of the seasonal high-water table. **Groundwater quality in the former UST location is an outstanding data gap for the Subject Property.** Although ENPRO (2021) identified the former UST as a data gap, and completed investigation work to address the data gap, the location of that work is inconsistent with the historical reported location of the UST, and this data gap has not been sufficiently addressed.

4.2 Pacific Rim Test Pit Investigation – 2007

Pacific Rim Soil & Water (Pacific Rim) completed a test pit exploration program, in 2007, in support of a potential stormwater facility design project on the Subject Property. The work provided a narrative description of observed soil conditions in each of the 21 test pits (P1 through P21; Figure 7) and indicated that 'fill in at least two test pits smelled of diesel or oil' (Pacific Rim, 2007). Table 2 presents the Pacific Rim observations, including total exploration depths and observed subsurface conditions.

Soil conditions observed in 19 of 21 test pits consisted of disturbed surface soil or fill, with many test pits containing 10 or more feet of fill and woody debris. Wood, described as coarse, fine and/or loose woody debris, tree boles, large logs, lumber, and bark, was observed in test pits P6, P10, P11, P13, P14, P15, P17, P18, P19, and P20 (Table 2). Fill soil was observed to the total depth of test pit explorations P13, P17, P19, and P20, which range from 10 to 11 feet bgs (Table 2). No soil samples were collected for laboratory analysis during this investigation.

Key Findings and Data Gaps: Petroleum-like odors were noted in fill soil observed in pits P10 and P17 between the ground surface and depths of 10 and 6 feet bgs, respectively. The subsurface conditions at test pits P10 and P17 were further evaluated during the ENPRO 2020/2021 investigation at borings B2/MW2 and B3/MW3, respectively. The ENPRO 2020/2021 investigation also included further evaluation of debris fill areas observed in test pits P11, P12, P13, P15, P18, and P19. The key findings and data gaps from the ENPRO investigation are summarized in Section 4.5.

4.3 RNS Subsurface Investigation – 2008

Robinson, Noble & Saltbush, Inc. (RNS) completed a subsurface investigation, in 2008, to characterize the area of suspected contamination,[3] and the extent and general composition of fill materials present on the Subject Property. The work consisted of the excavation of 32 exploratory test pits (TP1 through TP32; Figure 7) to depths ranging from 8 to 15 feet bgs, and collection and laboratory analysis of 32 soil samples for diesel-range TPH. RNS does not identify the sample collection depths for the 32 soil samples,

[3] Based on the observed subsurface conditions during the Pacific Rim investigation and "eyewitness testimony from an anonymous source that had been employed at the gravel pit when it was active" (RNS, 2008).

but states that they "typically included the fill-native material interface and the capillary fringe above the groundwater surface" (RNS, 2008). The data for soil samples collected by RNS is provided on Table 3.

There are no exploration logs or details in the report pertaining to the observed subsurface conditions except for a map depicting the interpreted surface geology and depth to native soil and the excerpted text below.

> *Fill material was found in all test pits except for Test Pits 13 and 33. These two test pits contained recessional outwash sand only. The majority of the fill on the subject site consists of reworked material from the surrounding region and counts for approximately 70% of the fill found in the test pits. The fill materials range from compact fine silt, fine sand with clay, silty sand and gravel, sand and gravel, and gravel. The remaining portion of the fill consists of wood debris in various forms, construction debris (i.e. asphalt, concrete, brick), and solid waste. While wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31. Test pit 11 has a thick layer of wood chips from five to eight feet bgs, and Test Pit 31 has a layer consisting of approximately 20% wood chips from five to twelve feet bgs. The other types of fill were distributed randomly throughout the site. However, Test Pits 11, 17, and 32 had a higher occurrence of construction debris and/or solid waste than the other pits. Field screening of these pits did not indicate the presence of contaminants.*

Key Findings and Data Gaps: Concentrations of TPH were detected above the laboratory detection limits in only 1 of the 32 soil samples collected as part of the RNS investigation (Table 3). Oil-range TPH were reported in the soil sample collected from test pit TP6 at a concentration of 370 mg/kg, which is below the MTCA Method A cleanup level of 2,000 mg/kg (Table 3). The TPH product was interpreted as "…heavy oil, most likely motor oil for diesel engines…" (RNS, 2008). Test pit TP6 is in the same area as Pacific Rim test pit P17, where petroleum hydrocarbons were also detected in soil; this area was further investigated by ENPRO during their 2020/2021 investigation. The findings of that investigation and any outstanding data gaps pertaining to the observations at RNS test pit TP6 are discussed in Section 4.5.

4.4 Ages Site Investigations – 2015

Ages Engineering, LLC (Ages) conducted site investigation work in 2015 that included a geotechnical subsurface investigation and sampling and testing of "several piles of soil and tree debris" (Ages, 2015a and 2015b).

Eight samples were collected from the piles and submitted for laboratory analysis of petroleum hydrocarbons and/or metals; however, there is poor documentation regarding the sample locations, sampled materials, sampling rationale, approach, and results.[4] Observations made at the time of the sample collection did not identify visual or olfactory evidence of contaminated soil or hazardous waste (Ages, 2015b). Four of the samples were analyzed for diesel-range petroleum hydrocarbons. The laboratory analytical results did not detect concentrations of petroleum hydrocarbons in the samples above the MTCA cleanup levels. The other four samples were analyzed for metals, including all 23 metals

[4] For this reason, these data are not included on figures or maps that accompany this report.

in the U.S. Environmental Protection Agency (EPA) Target Analyte List (TAL) plus boron, lithium, molybdenum, phosphorus, sulfur, silicon, tin, strontium, titanium, and yttrium. Ages concludes that all the heavy metals and petroleum levels detected in the sampled material were well below state and federal cleanup levels (Ages, 2015b).

The geotechnical investigation consisted of the excavation of 13 exploratory test pits to depths ranging from 5 to 13 feet bgs (ATP-1 through ATP-13; Figure 7; Ages, 2015a). Soil conditions observed in the test pits are consistent with subsurface conditions observed by others during previous investigations on the Subject Property and include variable depths of fill soil that contains tree roots and other woody debris overlying native soil that Ages described as outwash (Ages, 2015a).

Key Findings and Data Gaps: Laboratory analytical data for soil and tree debris from the Ages investigation has limited usefulness because there is poor documentation regarding the sample locations and sampled materials. However, the results did not identify TPH or metals in the sampled materials at concentrations that warrant further evaluation.

4.5 ENPRO Investigation – 2020/2021

ENPRO Environmental (ENPRO) conducted investigation activities on the Subject Property, in 2020 and 2021, to address data gaps with respect to contaminant sources, migration, and exposure pathways. The investigation work was described in a Remedial Investigation Work Plan (ENPRO, 2020), which was finalized after incorporating comments from Ecology provided during an informal review of the document.

The work consisted of the drilling of 21 soil borings (B1/MW-1 through B11/MW-11 and B12 through B21), construction of a permanent groundwater monitoring well in 11 of the borings (MW-1 through MW-11), and collection and laboratory analysis of soil and groundwater samples. The exploration locations are shown on Figure 7. A draft Remedial Investigation Report (ENPRO, 2021) was prepared to present the results of most of this work and is included in Appendix C for informational purposes only. The ENPRO draft Report was prepared independently and has not been reviewed or approved by Ecology. Borings B12 through B21 were completed by Associated Environmental Group, LLC (AEG; AEG, 2021) after preparation of the ENPRO report, as discussed further below.

ENPRO identified contaminants of concern for their investigation based on the contaminant source and data gap that the work was investigating. Select soil and groundwater samples collected by ENPRO were analyzed for the following contaminants (collectively, the COPCs):

- Gasoline-, diesel-, and oil-range TPH
- Volatile organic compounds (VOCs), including benzene, toluene, ethylbenzene, and xylenes (BTEX)
- Metals, consisting of the Resource Conservation and Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), copper, and hexavalent chromium in soil

- Total and dissolved metals, consisting of the RCRA 8 metals, copper, iron, and manganese in groundwater
- Polycyclic aromatic hydrocarbons (PAHs)
- Polychlorinated biphenyls (PCBs)
- Pentachlorophenol (PCP)

The specific data gaps identified by ENPRO, the work completed to address the data gaps, and the results of the investigation are as follows:

- **The quality of soil and groundwater in the vicinity of the former UST.** Boring B1 was advanced in the area where ENPRO interpreted the former UST to have been located; a monitoring well (MW-1) was constructed in the boring; two surface soil samples (SS1 and SS2) were collected in the estimated location of a former TPH-impacted soil stockpile; and soil and groundwater samples were submitted for laboratory analysis. However, further evaluation of historical documentation indicates that the former UST was located approximately 700 feet from where the ENPRO explorations were completed. **Groundwater quality in the former UST location is an outstanding data gap for the Subject Property.**
- **The quality of surface soil in the former garage.** Two surface soil samples (SS5 and SS6) were collected from the former interior of the dirt-floored garage where stained gravel/soil was previously observed, and drums were reportedly stored. Concentrations of TPH, metals, and PAHs were detected in both soil samples below the MTCA cleanup levels (Table 4). The surface soil data indicate that operations in the former garage did not result in releases of hazardous substances at concentrations that pose a risk to human health or the environment.
- **The quality of surface soil in the former garage area.** Two surface soil samples (SS3 and SS4) were collected from the north side of the former garage, where a small area (36 square foot) of stained gravel/soil was previously observed. In addition, two surface soil samples (SS7 and SS8) were collected from the former garage area where historical operations included an AST, drum storage, and vehicle maintenance. Concentrations of TPH, metals, and PAHs were detected in both soil samples, below the MTCA cleanup levels with one exception. Concentrations of total carcinogenic PAH (cPAH) toxic equivalent concentration (TEQ) were reported in the sample collected from SS3 at 0.12 mg/kg, which slightly exceeds the MTCA Method A cleanup level of 0.1 mg/kg (Table 4). The presence of cPAHs in soil at these low concentrations can be associated with *de minimus* releases of petroleum products from vehicle access and/or parking near the former garage or fill material. Nearby boring B8/well MW8 was advanced to evaluate the quality of fill soil in this vicinity, as described further below. Concentrations of cPAHs were not detected above the laboratory reporting limits in soil or groundwater samples collected from boring B8/well MW8, suggesting that the cPAHs are attributable to vehicle access and/or parking in the former garage area.
- **Nature and extent of contamination associated with debris fill areas.** Nine soil borings (B2 through B10) were advanced to evaluate fill, wood, construction

debris, and/or petroleum-like odors noted in previous explorations completed on the Site. The borings were completed as monitoring wells (MW2 through MW10) and soil and groundwater samples were collected for laboratory analysis. The explorations and the subject of their completion is as follows:

- Boring B2/well MW2 evaluated soil and groundwater in the vicinity of Pacific Rim's test pit P10, where petroleum-like odors were noted in fill material located between the ground surface and 10 feet bgs. Soil samples collected from boring B2 at depths of 7 and 15 feet bgs did not contain any of the COPCs at concentrations above the MTCA cleanup levels (Table 5). Groundwater samples collected from well MW2 contained TPH D+O, arsenic, iron, and manganese at concentrations exceeding the MTCA cleanup levels (Table 7). The soil data indicate that hazardous substances are not present in soil at the test pit P-10/boring B2 location at concentrations that pose a risk to human health or the environment. Groundwater quality at the Subject Property is discussed in Section 4.6.3.
- Although boring B2/MW2 was completed to evaluate the nature and extent of contamination associated with fill observed in test pit P10, the soil observed in boring B2 consisted of native soil and no debris fill was observed (Table 2). Although the locations of historical explorations are difficult to identify with certainty, it appears that buried debris fill exists on the Subject Property between boring B2/MW2 and the north Subject Property boundary. In addition, groundwater at well MW2 contains concentrations of COPCs above the cleanup levels. **The nature and extent of contamination associated with debris fill in the P10/TP32 area is an outstanding data gap.**
- Boring B3/well MW3 evaluated soil and groundwater in the vicinity of Pacific Rim's test pit P17 and RNS's test pit TP6, where petroleum-like odors were noted in fill material located between the ground surface and 6 feet bgs and concentrations of oil-range TPH were detected below the MTCA cleanup level. Soil samples collected from boring B3 at depths of 7, 10, and 15 feet did not contain concentrations of any of the COPCs with the following exception: TPH D+O was detected in the soil sample collected from a depth of 10 feet bgs at 5,200 mg/kg, which exceeds the MTCA cleanup level of 2,000 mg/kg (Table 5). A deeper soil sample, collected from 15 feet bgs, did not contain TPH D+O above the MTCA cleanup level. Boring B21 was advanced to the south of boring B3, and soil samples collected at depths of 5 and 10 feet bgs did not contain TPH D+O above the MTCA cleanup level, bounding the extent of TPH D+O in soil to the south (Table 5; Figure 9). Groundwater samples collected from well MW3 contain TPH-D+O, iron, and manganese at concentrations exceeding the MTCA cleanup levels (Table 7). **The nature and extent of TPH D+O in soil to the west, north, and east of boring B3 is an outstanding data gap.**
- Boring B4/MW4 was completed near Pacific Rim's test pit P11, where the upper 3 feet of fill, which extends to 12 feet bgs, contains 12- to 18-inch-diameter tree boles. Native gravelly sand was documented at 12 feet bgs (Table 2). Soil samples collected at depths of 7 and 15 feet bgs from boring

B4, in fill and native soil, respectively, did not contain concentrations of the COPCs above the MTCA cleanup levels (Table 5). Groundwater samples collected from well MW4 contain TPH-D+O, iron, and manganese at concentrations exceeding the MTCA cleanup levels (Table 7). The soil data indicate that hazardous substances are not present in soil at the test pit P-11/boring B4 location at concentrations that pose a risk to human health or the environment.

- Boring B5/MW5 was completed near Pacific Rim's test pit P12 where 8 feet of 'massive random fill' was observed overlying a disturbed historical surface of native sand (Table 2). Soil samples collected at depths of 7 and 15 feet bgs at boring B5 did not contain concentrations of the COPCs above the MTCA cleanup levels (Table 5). Groundwater samples collected from well MW5 contain TPH-D+O, iron, and manganese at concentrations exceeding the MTCA cleanup levels (Table 7). The soil data indicate that hazardous substances are not present in soil at the test pit P-12/boring B5 location at concentrations that pose a risk to human health or the environment.
- Boring B6/MW6 was completed near Pacific Rim's test pit P13 where fill material observed between 4 and 10 feet bgs contained asphalt and concrete, and the test pit was terminated in loose 100 percent woody debris at 11 feet bgs (Table 2). Soil samples collected at depths of 7 and 15 feet bgs at boring B6 did not contain concentrations of the COPCs above the MTCA cleanup levels (Table 5). Groundwater samples collected from well MW6 contain TPH-D+O, iron, and manganese at concentrations exceeding the MTCA cleanup levels (Table 7). The soil data indicate that hazardous substances are not present in soil at the test pit P-13/boring B6 location at concentrations that pose a risk to human health or the environment.
- Boring B7/MW7 was completed near Pacific Rim's test pit P14 where mixed fill that includes wood and construction debris were observed between 2 and 12 feet bgs (Table 2). Soil samples collected at depths of 7 and 15 feet bgs at boring B7 did not contain concentrations of the COPCs above the MTCA cleanup levels (Table 5). Groundwater samples collected from well MW7 contain TPH-D+O, iron, and manganese at concentrations exceeding the MTCA cleanup levels (Table 7). The soil data indicate that hazardous substances are not present in soil at the test pit P14/boring B7 location at concentrations that pose a risk to human health or the environment.
- Boring B8/MW8 was completed near Pacific Rim's test pit P15 where 7 feet of fill material containing concrete chunks and woody debris was observed overlying native sand (Table 2). Soil samples collected at depths of 7 and 15 feet bgs at boring B8 did not contain concentrations of the COPCs above the MTCA cleanup levels (Table 5). Concentrations of COPCs were not detected in groundwater samples collected from well MW8 above the MTCA cleanup level except for manganese, which was detected exceeding the cleanup level in the sample collected in November 2020, but was below the cleanup level in the sample collected in May 2021 (Table 7). The soil data indicate that hazardous substances are not present in soil at the test pit P15/boring B8 location at concentrations that pose a risk to human health or the environment.

  - Boring B9/MW9 was completed near Pacific Rim's test pit P18 where 9 feet of fill soil contained solid waste (tire fragments and wire) and mixed coarse and fine woody debris (Table 2). Soil samples collected at depths of 7 and 15 feet bgs at boring B9 did not contain concentrations of the COPCs above the MTCA cleanup levels (Table 5). The soil data indicate that hazardous substances are not present in soil at the test pit P18/boring B9 location at concentrations that pose a risk to human health or the environment. Groundwater from well MW9 was collected and analyzed in May 2021 and contained TPH D+O, iron, and manganese at concentrations exceeding the MTCA cleanup levels (Table 7). However, there was insufficient water in well MW9 for collection of a sample in November 2020 and there was very little water in the well in May 2021 (Table 8) so the groundwater data may not be representative of groundwater conditions in the vicinity of the well.
  - Boring B10/MW10 was completed near Pacific Rim's test pit P19 where fill material was observed to the total depth of the exploration at 11 feet bgs and contained an estimated 25 percent bark between approximately 3.5 feet and 11 feet bgs (Table 2). Wood debris was observed in the upper 7 feet of boring B10/MW10 with native sand interpreted to be present at approximately 7 feet bgs (Table 2). Soil samples collected at depths of 7 and 15 feet bgs at boring B10 did not contain concentrations of the COPCs above the MTCA cleanup levels (Table 5). The soil data indicate that hazardous substances are not present in soil at the test pit P19/boring B10 location at concentrations that pose a risk to human health or the environment. Groundwater was not observed at the time of drilling at boring B10; however, monitoring well MW10 was installed with a screened interval constructed between 5 and 15 feet bgs. Well MW10 did not contain sufficient water in November 2020 or May 2021 to allow for groundwater sample collection and analysis (Table 8).

- **Nature and extent of contamination associated with fill piles and log/materials storage areas.** Soil samples were collected from one boring (B11) and 14 surface locations (SS9 through SS12 and SS16 through SS25), where fill piles (including imported soil, construction debris, and wood debris) and log/materials storage areas were reported by others or observed in historical aerial photographs. The boring was completed as a monitoring well (MW11) and soil and groundwater samples were submitted for laboratory analysis. The results did not detect any of the COPCs in soil or groundwater at concentrations exceeding the MTCA cleanup levels, including oil-range petroleum hydrocarbons, PAHs, metals, and PCP, which can be associated with treated wood (Tables 4 and 7). The soil data indicate that the fill piles and log/materials storage areas do not represent a source of hazardous substances to the Subject Property.

- **Potential impacts to wetland sediment.** Three surface soil samples (SS13 through SS15) were collected between the buffer area of Wetland B, between areas of historical fill placement and/or ground disturbance, and Wetland B (Figure 9). The results did not detect concentrations of COPCs above the MTCA soil cleanup levels, which indicates that the erosion and transport of fill via overland flow to Wetland B is not a complete contaminant migration pathway at the Subject Property (Table 4). **The erosion and transport of fill via overland flow to Wetlands A, C, D, and E has not been evaluated as a contaminant migration pathway and is an outstanding data gap. In addition, the discharge of groundwater to all Subject Property wetlands is a potential contaminant migration pathway that has not been evaluated.**

- **Groundwater characteristics of the perched water bearing zone.** A total of eleven groundwater monitoring wells (MW1 through MW11) were installed to address the data gaps regarding groundwater quality and to evaluate groundwater flow direction and gradient across the Subject Property. As discussed in Section 4.6.3, the presence, nature, and extent of contaminants in shallow groundwater has not been fully evaluated and is a data gap for the Subject Property.

Borings B12 through B21 were completed by AEG in June 2021, after the drilling and sampling work that was conducted in November 2020, and two rounds of groundwater monitoring and sampling at the monitoring wells in November 2020 and May 2021. The objectives of the June 2021 work are not clear; however, soil and groundwater sample analyses were limited to diesel-range TPH, arsenic, iron, and manganese (Table 6). Based on this, we presume that the June 2021 work was conducted to further evaluate the nature and extent of TPH in groundwater; however, there are no details pertaining to the groundwater sampling depths from borings B12 through B21. Therefore, the groundwater data from these explorations have limited usefulness in addressing data gaps on the Subject Property.

The surface soil and subsurface soil data collected during the investigation completed by ENPRO and AEG in 2020 and 2021 is summarized in Tables 4 and 5, respectively. Reconnaissance groundwater data, for samples collected from temporary borings, is provided in Table 6. Groundwater data collected from the monitoring wells is summarized in Table 7. Groundwater samples were not collected from well MW-10 because the well did not contain sufficient water during either of the sampling events (Table 8). Well MW-9 was sampled in May 2021; however, the water level was quickly lowering during purging, so a sample was collected before stabilization occurred and may not be representative of groundwater quality. A comprehensive summary of the existing data is provided in the following section.

4.6 Summary of Existing Data

This summary of existing data includes visual observations of subsurface conditions made during previous geotechnical and environmental investigations at the Subject Property, and results for soil and groundwater samples collected between 2008 and 2021.

4.6.1 Soil and Groundwater Conditions

Historically, Parcel A of the Subject Property was used as a gravel pit and a log and lumber storage yard from at least 1960 through the 1990s (ENPRO, 2020). The sands and gravels of the surficial recessional outwash (Qvr) were mined from across portions of the Subject Property beginning in the 1960s (AMEC, 2004). Based on the amount of subsurface fill observed in explorations completed to date on the Subject Property, the premined thickness of the recessional outwash was between approximately 10 and 20 feet. On the eastern portion of the Subject Property, which remains relatively undisturbed, glacial till is generally observed at depths of less than 5 feet bgs, but was noted as deep as 7.5 feet bgs (RNS, 2008). Mining reclamation included infilling excavations, mostly on Parcels A and B, with fill soils and solid waste (construction debris, wood waste, etc.).

The existing data and information have been compiled to evaluate subsurface conditions at the Subject Property. The subsurface soil conditions documented at each subsurface exploration completed to date are summarized on Table 2; however, the source documents should be referenced for additional detail and information. The data collected during previous investigations has been compiled to evaluate sufficiency of those investigations to characterize the depth and quality of fill at the Subject Property. Where there is conflicting information about subsurface conditions, location accuracy and available backup information were considered in the interpretation of subsurface conditions. For example, there is poor location accuracy for the Pacific Rim test pits so subsurface conditions for nearby explorations with location information (such as the ENPRO and AEG 2020 and 2021 explorations) are considered to provide a better representation of Subject Property conditions. Similarly, many of the fill observations documented by RNS are depicted as depths on a single map and there are no exploration logs, soil descriptions, or details in the report pertaining to the observed subsurface conditions. Therefore, subsurface conditions for nearby explorations that include detailed descriptions of subsurface conditions provide a better representation of Subject Property conditions. **The potential for leaching of contaminants from fill to groundwater in those portions of the Subject Property where the depth and quality of fill has not been fully characterized is a data gap and is discussed in Section 4.6.3.**

Buried wood debris has been sporadically observed in fill across the Subject Property, ranging from bark and wood chips to large logs, roots, and tree boles (trunks). Figure 10 depicts the locations where buried wood debris has been observed in subsurface explorations. The descriptions of observed buried wood debris are provided on Figure 10 for six areas of the Subject Property for spatial reference. For RI purposes, these areas are representative of any location where buried wood debris may be located on the Subject Property because they contain all types, thicknesses, and locations of wood debris that have been observed. The presence and nature of buried wood debris in other locations are described in Table 2. **The potential generation of methane from the degradation of buried wood debris is an outstanding data gap for the Subject Property.**

The depth to groundwater measured in Subject Property monitoring wells during sampling events in November 2020 and May 2021 ranged from 3.2 feet to 14 feet below the top of the monitoring well casings (Table 8). Groundwater elevations calculated using these water level measurements indicate that a groundwater high bisects the Subject Property from southwest to northeast (Figures 11 and 12). Groundwater at the Subject Property appears to flow predominantly towards the northwest (west of the groundwater high) or towards the east-southeast (east of the groundwater high). This may be a localized condition associated with surface drainage and localized groundwater flow towards Wetlands B and C. According to Earth Solutions' Hydrogeologic Report (Earth Solutions, 2016), shallow groundwater at the Subject Property is presumably connected to a perched aquifer, which is hydrologically separated from the larger, deeper regional aquifer by glacial till, which acts as a confining layer between the two aquifer systems.

4.6.2 Soil Quality

The existing soil quality data for the Subject Property consists of the following:

- A total of 33 soil samples collected from 33 RNS test pit locations (Table 3).
- A total of 25 surface soil samples collected from 25 locations by ENPRO in 2020 (Table 4).
- A total of 37 subsurface soil samples collected from 21 soil borings by ENPRO and AEG in 2020 and 2021 at depths ranging from 5 to 18 feet bgs (Table 5).

Concentrations of gasoline-, diesel-, and oil-range TPH were not detected above the laboratory reporting limits in any of the soil samples collected during the 2008 RNS investigation (Table 3). However, these data have limited usefulness because the sample depths are not documented.

The surface soil data did not identify any of the COPCs at concentrations exceeding the MTCA Method A/B soil cleanup levels except for two locations (SS-3 and SS11), where the concentration of total cPAHs is above the MTCA Method A cleanup level (Table 4).

The subsurface soil data includes a total of 37 samples (not including 4 field duplicates), with 6 representing fill soil and 31 representing native soil (Table 5). Of these data, one sample of fill soil collected from 10 feet bgs at boring B3 contained total diesel-range extended petroleum hydrocarbons (TPH-D+O)[5] above the MTCA Method A cleanup level (Table 5). Boring B3 was advanced near the location of Pacific Rim test pit P17, where petroleum-like odors were noted (Figure 9).

4.6.3 Groundwater Quality

The groundwater data for the Subject Property includes eight reconnaissance samples collected from temporary soil borings, and two rounds of groundwater monitoring and sampling at the 11 monitoring wells. The groundwater analytical data is provided in Tables 6 and 7 for the reconnaissance and well samples, respectively. The following analytes have been detected in groundwater at concentrations that exceed the MTCA Method groundwater cleanup levels for unrestricted land uses, as shown on Figure 13:

- TPH-D+O
- Arsenic, iron, and manganese

The reconnaissance groundwater samples collected from borings B12 through B21, and groundwater samples collected from monitoring wells B1/MW1, B8/MW8, AND B11/MW11 did not contain concentrations of TPH-D+O above the laboratory reporting limits (Tables 6 and 7; Figure 13). Concentrations of TPH-D+O were detected above the MTCA Method A groundwater cleanup level of 500 micrograms per liter (µg/L), during one or both sampling events, at wells B2/MW2 through B7/MW7 and B9/MW9 (Table 7; Figure 13).

[5] Ecology requires summing reported concentrations of diesel- and oil-range petroleum hydrocarbons for comparison to the MTCA Method A cleanup level unless it can be determined that two separate petroleum products are present.

The presence of nonpetroleum organic matter (such as leaf litter, bark, and peat) may result in elevated or false positive reported concentrations of TPH-D+O in groundwater. All of the monitoring wells that contain TPH-D+O at concentrations above the MTCA Method A groundwater cleanup level are located within areas of the Subject Property where both peat and buried wood debris have been observed in subsurface explorations.

Arsenic is reported above the MTCA cleanup level of 8 μg/L in wells B2/MW2, B4/MW4, B5/MW5, B6/MW6, and B7/MW7, which are located in the northwest corner of Parcel A and the southeast corner of Parcel B (Figure 13). Iron and manganese were detected in groundwater at concentrations exceeding the MTCA cleanup levels at all Subject Property monitoring wells, except B1/MW1 and B11/MW11 (Table 7). In all well locations where arsenic, iron, and manganese were detected in groundwater above their respectively cleanup levels, there is either organic matter (peat and organic-rich soil) documented in the borehole itself or woody debris observed in nearby subsurface explorations. In addition, concentrations of TPH-D+O are above the MTCA cleanup level in groundwater in most wells (all except well B8/MW8) where iron and manganese are detected above the MTCA cleanup levels. The presence of organic carbon in groundwater, associated with either organic matter and/or petroleum hydrocarbons, may be a source mechanism for mobilization of metals to groundwater as further discussed in Section 5.1.4.

The presence, nature, and extent of contaminants in shallow groundwater has not been fully evaluated and is a data gap for the Subject Property, specifically:

- Petroleum in groundwater. The potential interference of organic matter on reported concentrations of diesel- and oil-range petroleum hydrocarbons in groundwater. Additional groundwater characterization is necessary to evaluate the presence, nature, and extent of petroleum hydrocarbons in groundwater at the Subject Property.

- Nature and extent of contaminants in groundwater. The groundwater flow direction at the Subject Property is predominantly towards the northwest, although existing data suggest that a groundwater high exists on the southeast portion, beyond which, groundwater flows to the east-southeast. Additional data is warranted to evaluate the nature and extent of contaminants in groundwater. Specific groundwater data gaps and the proposed work to address them are identified in Section 7.4.6.

- Fill leaching to groundwater. Presence, nature, and extent of contaminants in groundwater from areas of the Subject Property, where the total depth and quality of fill has not been fully evaluated, including:

    - The northwest corner of the Subject Property at P10, TP32, and TP12.

    - The west-central portion of the Subject Property at ATP-10, P13, and TP11.

    - The east-central portion of the Subject Property at P20, TP27, TP28, P19, and TP31.

- Background groundwater quality. Seven of the existing eleven monitoring wells are partially screened within fill material. Additional groundwater characterization may be necessary to evaluate background groundwater quality to evaluate the source, nature, and extent of contaminants in groundwater attributable to the historical uses of the Subject Property.

5 Preliminary Conceptual Site Model

A preliminary CSM for the Subject Property has been developed to evaluate potential pathways by which receptors can be exposed to hazardous substances and to identify data gaps in the existing site characterization data. The results of the RI will be used to refine this CSM as a basis for defining the extent of the Site, identification of the Site COPCs, and developing the cleanup levels. The preliminary CSM is provided below and includes a discussion of known and suspected source areas on the Subject Property, the preliminary COPCs based on existing data and information, and potential contaminant migration and exposure pathways.

5.1 Known and Suspected Sources

Based on the historical information, the potential known and suspected sources of hazardous substances on the Subject Property consist of the following:

- The former UST and historical structures located in the south-central portion of the Subject Property, which Ecology has suggested may have been used as garage or maintenance areas prior to building the home and garage in the southwest portion of the Subject Property, although there is no historical information to indicate this.
- The former garage area that included an AST, the storage of drums of oil and drive train fluid in and around the garage, and surface staining in the garage and north of the garage, where equipment and vehicles were parked.
- Fill material used in reclamation of the mined areas of the Subject Property, including any hazardous substances generated or mobilized by the decomposition of fill material.

Although there is documentation of the storage of logs on the Subject Property, the historical presence of log piles alone is not an environmental condition that would warrant identification as a known or suspected source of hazardous substances on the Subject Property.

The data from soil and groundwater collected on the Subject Property during previous investigations has not identified the presence of contaminants that would indicate the storage of treated wood, disposal of toxic waste, ‘waste from Weyerhaeuser,’ Agent Orange (reported to Ecology by individuals using the state Environmental Incident Reporting system), or potential dumping into the septic system (identified by Robinson Noble as a potential environmental concern [Robinson Noble, 2019]). The subsurface conditions observed at the Subject Property have indicated significant volumes of fill soil, in places mixed with construction debris and woody debris. Woody debris consists primarily of tree trunks and bark with some localized areas where milled timber was observed. Treated wood was not observed to be present anywhere on the Subject Property and the laboratory analytical results for soil samples collected during previous investigations, including those from fill horizons containing woody debris, have not detected concentrations of wood-treating chemicals that would suggest the storage or disposal of treated wood. Specifically, surface and subsurface soil samples were collected from 15 locations in 2020, where fill piles and/or log/materials storage areas were reported by others; the results of soil and groundwater samples collected from these locations did not detect any of the COPCs in groundwater above the MTCA cleanup levels. In addition, the soil and groundwater data collected in 2020 and 2021 do not identify the presence of hazardous substances in soil or groundwater that would indicate disposal of other types of waste.

A discussion of the potential known and suspected sources of hazardous substances on the Subject Property is provided in the following subsections.

5.1.1 Former UST

The former diesel fuel UST was decommissioned by permanent removal in 1993 (Stemen, 1993). Soil samples collected at the limits of the excavation did not contain concentrations of petroleum hydrocarbons above cleanup levels, and the excavation was backfilled. Soil removed from the excavation that contained petroleum-like odors was segregated and stockpiled from soil containing no visual or olfactory evidence of petroleum hydrocarbons, and a characterization sample was collected for laboratory analysis. The concentrations of TPH detected in the stockpile soil in 1993 are below current Ecology cleanup levels. However, groundwater quality in the vicinity of the former UST has not been evaluated.

5.1.2 Former Garage Area

The former garage area includes the former, dirt-floored garage where small patches of stained soil were observed, historical locations of approximately 10 55-gallon drums of oil and drive-train fluid stored in and around the garage, areas of surface staining outside of the garage to the north, where equipment and vehicles were reportedly parked, and an AST (AMEC, 2004).

Four subsurface explorations have been advanced in the former garage area, including three exploratory test pits in 2008 (TP1 through TP3) and boring/monitoring well B8/MW8 in 2020 (Figure 7). In addition, six surface soil samples were collected from the former garage area in 2020 (SS3 through SS8; Figure 7). A total of six surface soil and six subsurface soil samples have been collected from the former garage area and submitted for laboratory analysis. The analytical results for these 12 soil samples did not detect petroleum hydrocarbons, BTEX, metals, PAHs, PCBs, or VOCs above the MTCA soil cleanup levels, with one exception. Concentrations of total cPAH TEQ were detected at 0.12 mg/kg in surface soil sample SS3, which is less than two times the MTCA Method A soil cleanup level of 0.1 mg/kg (Table 4).

Groundwater samples were collected from monitoring well B8/MW8 in November 2020 and May 2021. The laboratory analytical results did not detect concentrations of petroleum hydrocarbons, BTEX, metals, PAHs, PCBs, or VOCs above the MTCA cleanup levels for groundwater, with one exception. Concentrations of manganese (both total and dissolved) were reported at 2,500 μg/L in November 2020, which is above the MTCA cleanup level of 750 μg/L (Table 7). As discussed in Section 5.1.4, manganese can be elevated in the presence of organic-rich sediments and/or organic materials (such as buried wood waste), due to geochemically reducing conditions that result from the depletion of dissolved oxygen during the decomposition of organic carbon.

The data collected from the former garage area do not indicate the presence of petroleum or petroleum-related contaminants in soil or groundwater at concentrations exceeding the MTCA cleanup levels for unrestricted land uses, except for a single, low concentration of total cPAH TEQ that can be attributed to *de minimus* surface soil staining in a former vehicle parking area. Sufficient data has been collected to conclude that the former garage area is not a source of contaminants to soil or groundwater at the Subject Property.

5.1.3 Fill Material

The results of investigations completed to date on the Subject Property show that there is the widespread presence of fill material of variable content. RNS estimates that reworked native soil accounts for approximately 70 percent of the fill observed in their test pit explorations (RNS, 2008). Pacific Rim indicated that much of the fill observed in their test pits was gravel and soil but identified buried debris at the Subject Property that frequently included large chunks of concrete, asphalt, large (12- to 18-inch-diameter) tree boles (trunks), and nondescript construction debris with lesser observations of logs and timber, rebar, wire, metal strips/debris, cedar planks, and bark (Pacific Rim, 2007). ENPRO completed investigation work to evaluate the nature and extent of contamination associated with fill material, including those fill materials identified by Pacific Rim and RNS.

The potential concerns associated with fill material consist of the following:

- The quality of fill soil that may have been imported from unknown sources off the Subject Property, and the potential leaching of contaminants present in imported soil to groundwater.
- The potential leaching of contaminants from buried anthropogenic debris used for fill (concrete, metal, asphalt) to groundwater.
- The generation of methane from the degradation of buried wood waste and the resulting anaerobic, geochemically reducing subsurface conditions.

Samples of fill soil collected and analyzed to date have not contained concentrations of contaminants that pose a risk to human health or the environment, with two exceptions. Surface soil samples collected from two locations contain total cPAHs at concentrations of 0.12 and 0.54 mg/kg, which exceed the MTCA Method A cleanup level of 0.1 mg/kg. PAH compounds have low aqueous solubilities and are hydrophobic, so they do not readily leach from soil to groundwater. Data collected from the Subject Property monitoring wells over two sampling events did not detect total cPAHs in groundwater above the laboratory reporting limits, demonstrating total cPAHs are not leaching from soil at levels that result in exceedances of the MTCA groundwater cleanup level.

A soil sample collected from a depth of 10 feet bgs at boring B3/MW3 contains TPH-D+O at a concentration of 5,200 mg/kg, exceeding the MTCA Method A cleanup level of 2,000 mg/kg. Monitoring well B3/MW3, constructed in the same boring, is screened across the soil sample interval from where the oil-range TPH exceedance was reported, from
5 to 15 feet bgs. The results of two groundwater sampling events at well B3/MW3 reported TPH-D+O below and just above the MTCA Method A cleanup level of 500 µg/L, with reported concentrations of 365 µg/L and 635 µg/L (Table 7). The data indicate that the soil leaching to groundwater pathway may be resulting in exceedances of the MTCA Method A cleanup level for groundwater at this location.

5.1.4 Redox-Sensitive Inorganics

Arsenic, iron, and manganese are naturally occurring in soil, rocks, and minerals, and where water comes into contact with these materials, can be dissolved into groundwater. Biodegradation of organic contaminants, like petroleum hydrocarbons, or the decomposition of organic matter can deplete oxygen in groundwater, creating an environment where metals that are sensitive to redox conditions (like iron and manganese) are reduced to more soluble and mobile valence states. Elevated concentrations of arsenic, iron, and manganese in groundwater, relative to background groundwater quality, can be associated with anaerobic groundwater caused by the contaminant biodegradation and/or the decomposition of organic matter.

Arsenic, iron, and manganese are naturally occurring, redox-sensitive inorganics in soils, which are mobilized into groundwater via reductive dissolution. Local and/or regional background concentrations for metals in groundwater are:

- Arsenic – 8 µg/L for arsenic in the Puget Sound Basin (Ecology, 2022a). The MTCA groundwater cleanup level is based on this background threshold value (Tables 6 and 7).
- Dissolved iron – Ranges from <3 µg/L to 21,000 µg/L in north Thurston County (Drost et al., 1998).
- Dissolved manganese – Ranges from <1 µg/L to 3,400 µg/L in north Thurston County (Drost et al., 1998)

The MTCA groundwater cleanup levels for iron and manganese are 11,000 µg/L and 750 µg/L, respectively, which indicates that naturally occurring concentrations of these metals are present in groundwater in the Subject Property vicinity above the MTCA cleanup levels. However, iron and manganese have been detected in groundwater collected from borings and monitoring wells at the Subject Property at concentrations above the regional background concentration ranges.

The groundwater quality data that is available for the Subject Property (recorded during the May 2021 sampling event) indicates dissolved oxygen that is below 1 milligram per liter (mg/L) and oxidation-reduction potential (ORP) that is between -20 and
-80 millivolts (mV), suggesting anaerobic conditions in all wells, except B11/MW11 (Table 7). Well B11/MW11 is screened mostly within undisturbed glacial till, and no organic matter was documented to be observed in the boring. The groundwater sample

collected from well B11/MW11 in May 2021 had dissolved oxygen at 7 mg/L and ORP at 155 mV. These data suggest reducing conditions are prevalent across the portions of the Subject Property where organic matter has been observed in the subsurface.

5.2 Contaminant Migration and Exposure Pathways

An exposure pathway describes the mechanisms by which human or ecological exposure to a contaminant can occur under current or future conditions, assuming no remedial action or protective control is in place. To be considered complete, an exposure pathway has the following characteristics:

- An identified source of contaminants
- A mechanism for contaminant release and transport from the source
- An exposure route through which contact with the contaminant can occur
- A receptor that can be exposed to the contaminant

An exposure pathway is considered complete if a human or ecological receptor can be exposed to a contaminant via that pathway. Current and potential future exposure pathways consider reasonable anticipate future site uses. The following exposure pathways and receptors are potentially complete at the Subject Property:

- Contaminated soil/fill material leaching to groundwater. Contaminants present in soil and fill material can leach to groundwater by infiltration of precipitation through contaminated soil and fill material, or where groundwater is in contact with contaminated soil or fill material.
- Ingestion of groundwater. Human receptors have the potential to contact contaminants in groundwater via ingestion.
- Direct contact with soil and fill material. Human and terrestrial receptors have the potential to contact contaminants in soil and fill material.
- Contaminated soil/fill material erosion with transport via overland stormwater flow to the wetlands with potential exposure to ecological receptors through direct contact with and/or ingestion of wetland sediment.
- Contaminated groundwater discharge to wetland surface water with potential exposure to ecological receptors through direct contact with and/or ingestion of surface water.
- Methane accumulation in indoor air of future structures. Methane has the potential to be explosive and can migrate from the subsurface into residential structures and expose residents to hazardous conditions.

These potential exposure pathways have been considered in the identification of data gaps for the site characterization and additional data will be collected as part of the RI to determine whether a complete pathway exists at the Subject Property.

5.2.1 Terrestrial Ecological Evaluation

The Subject Property does not qualify for an exclusion from a terrestrial ecological evaluation (TEE) and either a simplified or site-specific TEE is required under MTCA.

An evaluation of the appropriate TEE will be provided in the RI along with the required TEE.

6 Data Gaps

The results of the previous investigations and preliminary CSM have been evaluated with respect to potential outstanding data gaps in the site characterization to:

- Define the extent of the Site.
- Adequately characterize the Site to identify potential risks to human health and the environment in accordance with WAC 173-340.
- If determined to be necessary, select a cleanup action under WAC 173-340-360 through -390.

The Site is defined by any area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located (RCW 70A.305.020(8)). The specific outstanding data gaps in the site characterization for the Subject Property, identified in Section 4, consist of the following:

- Groundwater quality in the former UST location.
- The nature and extent of TPH D+O in soil to the west, north, and east of boring B3.
- The nature and extent of contamination associated with debris fill in the P10/TP32 area.
- Potential contaminant migration through erosion and transport of fill via overland flow to Wetlands A, C, D, and E and the discharge of groundwater to all Subject Property wetlands.
- The presence, nature, and extent of contaminants in shallow groundwater, including the potential interference of nonpetroleum organic matter on reported concentrations of diesel- and oil-range hydrocarbons in groundwater, the nature and extent of contaminants in groundwater, potential leaching of contaminants from fill to groundwater, and background groundwater quality.
- Methane generation. Sufficient data has not been collected to determine whether methane is being generated by the degradation of buried wood waste, so methane is a COPC until additional data can be collected to confirm its presence or absence at the Subject Property.

In addition, Ecology has identified the following data gaps:

- The presence, nature, and extent of contaminants in fill and potential migration of contaminants from fill soil to groundwater on the Subject Property.

The RI Work Plan in Section 7 presents a phased approach to address these data gaps.

7 Remedial Investigation Work Plan

7.1 Remedial Investigation Objectives

The RI is intended to collect, develop, and provide sufficient data and information regarding a site to confirm that a release of a hazardous substance has occurred, and, if so, to adequately characterize the nature and extent of the release to enable Ecology to select a cleanup action in accordance with MTCA. The specific objectives of the RI for the Subject Property are to:

- Provide a summary of previous investigations conducted at the Subject Property, including information regarding the nature and extent of fill material and existing chemical data that are relevant to evaluating the extent of contamination and identification of data gaps that require investigation to enable evaluation and selection of a cleanup action.
- Determine the nature and extent of contamination in all relevant media and characterize the fate and transport of identified contaminants, including how contaminants migrate between media.
- Use the information collected to evaluate potential risk to human health and the environment through complete exposure pathways under current and likely future land use scenarios. Identify likely cleanup components, cleanup standards, and applicable state and federal laws that pertain to the cleanup action.
- Report the methods and findings of the RI to Ecology, stakeholders, and the local community.

The RI Work Plan describes the project objectives, functional activities, and quality assurance/quality control (QA/QC) protocols that will be used to complete the RI.

7.2 Preliminary Constituents of Potential Concern

The COPCs for the RI are those chemicals that are potentially present, based on reported and/or documented historical land use at the Subject Property. The sediment COPCs for the RI are those chemicals identified for freshwater sediment in the Sediment Management Standards, WAC 173-204-563 (SMS). The general COPC analytes for the RI are:

- TPH in soil, groundwater, and sediment
- VOCs, including BTEX in soil and groundwater
- Metals in soil, groundwater (total and dissolved), and sediment
- Semivolatile organic compounds (SVOCs) in soil, groundwater, and sediment
- PCBs in soil, groundwater, and sediment
- Pesticides and conventionals (ammonia and total sulfides) in sediment

Tables 9 through 12 present the COPCs by media. In addition, sufficient data has not been collected to determine whether methane is being generated by the degradation of buried wood waste, so methane is a COPC for the RI.

7.3 Proposed Site Screening Levels

This section presents the site screening levels, values that will be used to evaluate data collected during the RI to assess the presence, nature, and extent of contamination at the Subject Property. The site screening levels have been developed based on the current and potential future exposure pathways and receptors discussed in Section 5.2, and applicable regulatory criteria and are presented on Tables 9 through 12. The proposed site screening levels are the same as those used to evaluate existing data and consist of the following.

For soil, the site screening levels include consideration of the following:

- The standard MTCA Method A and B cleanup levels from the Ecology Cleanup Levels and Risk Calculation (CLARC) database. Method B cleanup levels are used for those constituents where Method A cleanup levels have not been established.
- Natural Background Soil Metals Concentrations in Washington State (Ecology, 1994).

For groundwater, the site screening levels are based on the protection of drinking water and consist of the following:

- Standard MTCA Method A and B groundwater cleanup levels from the Ecology CLARC database.
- Natural background groundwater arsenic concentrations in Washington State (Ecology, 2022a)

For sediment, the site screening levels are based on the protection of the benthic community in freshwater sediment and consist of the following:

- Standard Freshwater Sediment Cleanup Objectives and Cleanup Screening Levels Chemical Criteria from the SMS, WAC 173-204-563.
- Sediment screening criteria developed for protection of human health using the beach play equations in Ecology's Sediment Cleanup User's Manual (SCUM; Ecology, 2021c) and toxicity values from Ecology's Cleanup Levels and Risk Calculation (CLARC; Ecology, 2023).

For surface water, the site screening levels and include consideration of the following[6]:

- Standard MTCA Method B surface water cleanup levels from the Ecology CLARC database.
- Water Quality Standards for Surface Waters for the State of Washington, WAC 173-201A.
- National Recommended Water Quality Criteria – Human Health, Section 304(a) of the Clean Water Act (CWA).

[6] In accordance with Ecology's Interim Policy 730: Taking into Account Federal Human Health Surface Water Quality Criteria under MTCA (Ecology, 2021a).

- Federal Water Quality Criteria applicable to Washington, 40 Code of Federal Regulations (CFR) 131.45.
- Concentrations of gasoline and diesel range organics predicted to be protective of aquatic receptors in surface waters (Ecology, 2021b).
- Natural background groundwater arsenic concentrations in Washington State (Ecology, 2022a).

Methane can be produced during decomposition of organic matter. MTCA does not provide cleanup levels for methane but does establish standard Method B air cleanup levels that do not exceed 10 percent of the lower explosive limit (LEL) of any hazardous substance (WAC 173-340-750). The LEL for methane is 5 percent by volume.

7.4 RI Approach

This section presents the approach for addressing the data gaps discussed in Section 6 to meet the RI objectives described in Section 7.1. Some data gaps will be addressed in a phased approach, collecting data and information from each phase that informs the scope of work for the next phase. The CSM will be updated as data is collected and evaluated to modify sampling locations and approaches to meet the objectives of each phase of the investigation. The work to be performed and the process and timeline for decision making based on results of each phase of work is presented, where applicable. The scope of work for the RI field program is presented below and will be implemented in consultation with Ecology, which may include modification or elimination to work phases based on the collection, evaluation, and interpretation of data throughout the RI process.

The preliminary RI sampling locations are depicted on Figure 14. The specific sampling and analysis details, including exploration locations, field sampling, laboratory analytical approach, and quality assurance/quality control (QA/QC) procedures, are presented in Appendix A, the Sampling and Analysis Plan (SAP), which includes the Field Sampling Plan and QA/QC Plan.

7.4.1 Groundwater Quality in Former UST Location

One groundwater monitoring well (MW12) will be installed in the approximate location of the former UST and shack for collection and laboratory analysis of groundwater samples (Figure 14). The nearest subsurface exploration to this location is test pit P16, where less than 3 feet of fill soil, consisting of gravelly loam sand, was observed overlying native gravelly sand and sand to the total exploration depth of 12 feet (Figure 8). The monitoring well will be installed in native soil, with a screened interval constructed to span the water table, as observed at the time of drilling. Based on groundwater observed in surrounding explorations, groundwater is expected to be encountered at depths ranging from 6 to 10 feet bgs.

7.4.2 Boring B3 Area

The nature and extent of TPH D+O in soil to the west, north, and east of boring B3 is an outstanding data gap for the Subject Property (Figure 8). To address this data gap, soil borings will be advanced to the west, north, and southeast of boring B3, at distances of approximately 50 feet, to evaluate the nature and extent of TPH D+O in soil (Figure 14).

The borings will be advanced to a depth corresponding to 2 feet below the fill-native soil contact, as observed at the time of drilling, unless the results of field screening suggest the presence of contamination in native soil. If odors, staining, photoionization detector (PID) readings elevated above background, or sheen is observed in native soil, the boring will be advanced to a depth of 10 feet below the fill-native soil contact. Based on the depth to native soil observed in boring B3 at 11 feet bgs, the additional borings will be advanced to an estimated total depth of 13 feet bgs and a maximum depth of 21 feet bgs. Soil samples will be collected from each boring for laboratory analysis of TPH-D+O. A monitoring well will be constructed in the eastern boring to address a groundwater data gap, as described further in Section 7.4.6.

7.4.3 P10/TP 32 Area

To evaluate the nature and extent of contamination associated with debris fill in the P10/TP32 area (Figure 8), a phased approach will be implemented. The first phase of work will consist of shallow subsurface excavation to confirm the presence/absence of fill, characterize subsurface conditions, and collect samples for laboratory analysis. Subsequent phases of investigation will be conducted following the procedures generally outlined below. The specific scope of work for subsequent work, if necessary, will be determined in consultation with Ecology. The phased approach to address this data gaps is as follows:

1. Excavate four test pit explorations (Figure 14) in accordance with the procedures described in Section A.2.1.1. of the SAP (Appendix A). Soil samples that are representative of the conditions observed in each test pit, including fill soil, debris or soil underlying debris, native soil, and soil where field screening results suggest the presence of contaminants, will be collected for laboratory analysis.

2. One boring will be completed for construction of a monitoring well (MW13) to evaluate groundwater quality to the northwest of well B2/MW2, as discussed in Section 7.4.6. The preliminary location of the monitoring well is shown on Figure 14, and the final location will be determined based on the observations and results of the test pit exploration.

3. If the thickness of fill cannot be fully evaluated using test pit exploration, advance up to three additional soil borings along the north property line to determine the depth to native soil and evaluate the quality of fill and potential presence of debris. The borings will be advanced to total depths corresponding to 2 feet below the fill-native soil contact, as observed at the time of drilling, unless the results of field screening suggest the presence of contamination in native soil, in which case the boring will be advanced to a depth of 10 feet below the fill-native soil contact.

If contaminants are detected in soil, debris fill, or groundwater near the north boundary of the Subject Property, in the P10/TP32 Area, at concentrations above the Site Screening Levels, additional exploration may be necessary on the north-adjoining property. Any off-property work will be described in an Addendum to this Draft RI Work Plan that is prepared in consultation with Ecology.

7.4.4 Eastern Subject Property Area

The results of previous investigations have characterized soil conditions in this part of the Subject Property as consisting of shallow glacial till (Qvt), encountered at depths of 1.5 to 5 feet bgs, underlying fill and/or native soil at explorations (from north to south) TP24, P5, P4, TP30, P3, P2, B20, and P1 (Figure 8). The documented subsurface observations at test pit explorations TP23 and TP22 indicate 8 and 15+ feet of fill, respectively; however, these observations are anomalous with other observations in this area and there is no available documentation of subsurface conditions observed in these explorations, as described in Section 4.3. Based on previous reports, no wood debris, construction debris, or solid waste was observed in any of these explorations (Figure 8). However, there is anecdotal evidence that this area may have historically been used for storage and debarking of logs. Additional work will be completed to evaluate the presence, nature, and extent of contaminants in fill (including buried wood debris) and potential migration of contaminants from fill to groundwater on the eastern portion of the Subject Property.

Glacial till is typically very dense and will limit the vertical migration of contaminants if they are present in overlying fill. Because of the relatively thin layer of permeable soil that is documented to be present over glacial till, which is generally impermeable, shallow groundwater may not exist in the eastern Subject Property area. As discussed in Section 3.2, the thickness of the glacial till, which acts as a confining layer, is mapped at more than 100 feet thick beneath the Subject Property (Drost et al., 1999).

The work to address this data gap will be completed in a phased approach, as described in the following subsections.

7.4.4.1 Shallow Test Pit Exploration

The first phase of work will be conducted to evaluate the presence, nature, and extent of fill. Shallow test pit explorations will be excavated to confirm the presence/absence of fill, characterize subsurface conditions, and collect samples for laboratory analysis (Figure 14). The minimum test pit exploration depth of 6 feet is anticipated to be sufficient to identify the top of native soil and observe overlying soil conditions in the eastern Subject Property Area.

Where fill is observed, one sample of fill soil and one sample of underlying native soil will be collected for laboratory analysis of the COPCs. Where fill soil is not observed, one shallow soil sample will be collected from each test pit for laboratory analysis. The native soil samples will be collected from a depth of 1.5 feet bgs, to evaluate shallow soil quality where logs may have been historically stored.

The total depth will be determined in the field at the time of the excavation based on the observed subsurface conditions. If it is not practicable to determine the thickness of fill through test pit exploration, further investigation using drilling exploration methods will be conducted, as described in Section 7.4.4.2.

If the results of the shallow test pit exploration can fully characterize the presence/absence and thickness of fill (including wood debris, if present), and COPCs are not detected at concentrations that exceed the Site Screening Levels, there is not a complete migration pathway for contaminants to reach groundwater and this data gap will be considered to have been sufficiently addressed. If the extent of fill cannot be fully characterized and/or if COPCs are detected above Site Screening Levels, additional work will be completed as described in Section 7.4.4.2.

7.4.4.2 Deeper Soil Investigation

The second phase of work will be conducted based on the results of the first phase and consist of deeper soil investigation using drilling methods. The second phase of work will be completed if the results of the shallow test pit exploration indicates either of the following:

- If fill observed in the shallow test pit explorations extends to depths that cannot be practicably or safely determined using excavation methods:
  - Further investigation will consist of soil borings advanced through the fill to native soil to evaluate the vertical extent and quality of fill.
  - Soil borings will be advanced to total depths corresponding to 10 feet below the fill-native soil contact, as identified at the time of drilling.
  - Soil samples will be collected from the fill and underlying native soil for laboratory analysis of the COPCs, as follows:
    - Fill soil samples will be collected from any vertical interval where field screening results suggest the presence of contaminants (such as PID measurements that are elevated above background, staining, and/or sheen) and/or 1 foot below any observed debris.
    - If field screening results do not identify the presence of contaminants and no debris is observed, soil samples will be collected from the mid-point of the fill horizon and 1 foot below the fill-native soil contact.
    - Deeper soil samples will also be collected from the boring and retained for potential laboratory analysis. If the results of the shallowest native soil sample identify COPCs at concentrations above the Site Screening Levels, deeper soil samples will be analyzed to evaluate the vertical extent of COPCs in soil at concentrations exceeding the Site Screening Levels.
- If fill is observed in a test pit and the laboratory analytical results of both the fill and native soil samples indicate the presence of COPCs at concentrations exceeding the Site Screening Levels:
  - Further investigation will consist of advancing soil borings deeper into the native soil to collect soil samples to evaluate the vertical extent of COPCs at concentrations exceeding the Site Screening Levels in soil.
  - Borings will be advanced to a total depth corresponding to 15 feet below the depth of the native soil sample that contained concentrations of COPCs exceeding the Site Screening Levels. For example, if the native soil sample collected from the base of a test pit exploration at a depth of

6 feet bgs contains COPCs at concentrations exceeding the Site Screening Levels, a boring will be subsequently completed to 21 feet bgs.

  - Soil samples will be collected in 2.5-foot vertical intervals from the deepest test pit sample to the total depth of the boring for potential laboratory analysis. The shallowest soil sample will be initially submitted for laboratory analysis of the COPCs with samples collected from deeper intervals analyzed until the extent of COPCs exceeding the Site Screening Levels is defined.

- If fill is observed in a test pit and the laboratory analytical results indicate the presence of COPCs at concentrations exceeding the Site Screening Levels in fill, but not in the underlying native soil sample, no further work will be conducted.

7.4.4.3 Groundwater Investigation

As described in Section 5.2, a complete groundwater pathway requires an identified source of contaminants and a mechanism for release and transport of contaminants from the source. Because of the geologic and hydrogeologic conditions on the eastern Subject Property area, where groundwater may not be present because of the absence of permeable (water bearing) subsurface soils types, there may not be a complete transport pathway for contaminants present in shallow fill to reach groundwater.

However, if COPCs are detected in fill or native soil at concentrations exceeding the Site Screening Levels and groundwater is observed to be present within 15 feet of the deepest soil exceedances, monitoring wells will be installed and sampled to evaluate potential migration of contaminants from fill/native soil to groundwater. Monitoring well installation and groundwater sampling are discussed in Appendix A.

7.4.5 Wetland

Sediment and surface water samples will be collected from Subject Property wetlands to evaluate the potential for contaminant migration through erosion and transport of fill via overland flow to Wetlands A, C, D, and E, and the discharge of groundwater. The preliminary locations for wetland sediment and surface water sampling are depicted on Figure 14.

Sediment samples will be collected from each of Wetlands A through E for laboratory analysis of the sediment COPCs (Table 11). Two to three sediment samples will be collected from within each of the delineated wetland boundaries based on the size of the wetland estimated by Soundview (2020). Wetlands A, D, and E are estimated to be less than 0.25 acres in size; two sediment samples will be collected from each of these wetlands. Wetlands B and C are estimated to be slightly greater than 0.25 acres in size, at 0.326 and 0.251 acres, respectively; three sediment samples will be collected from each of these wetlands. At each sampling location, a sediment sample will be collected from the upper 4 inches and from 4- to 8 inches.

Surface water samples will also be collected from each of Wetlands A through E. Surface water in wetlands A, B, and C discharges to ditches or culverts that drain surface water off the Subject Property. The sample location for surface water in wetlands A, B, and C will be near the discharge point. Wetland D is an upland drainage swale with surface water that drains to the north and infiltrates within the Subject Property. The sample location for surface water in Wetland D will be upgradient of the infiltration area. Wetland E is a small, slope wetland located within the buffer of Wetland B. It drains via sheet flow across the slope and infiltrates. The sample location for surface water in Wetland E will be upgradient of the infiltration area. Surface water samples will be submitted for laboratory analysis of the surface water COPCs (Table 12).

7.4.6 Groundwater

The presence, nature, and extent of contaminants in groundwater, including the potential interference of nonpetroleum organic matter on reported concentrations of diesel- and oil-range hydrocarbons in groundwater, and background groundwater quality.

The work to address this data gap will consist of the following:

- Installation of two additional monitoring wells, one each downgradient of existing wells MW2/MW4 (MW13) and MW6 (MW14), to evaluate the nature and extent of TPH-D+O in groundwater.

  Well MW13 will also evaluate groundwater quality downgradient of previous exploration TP12, which was terminated in fill at a depth of 15 feet bgs.

  Well MW14 will also evaluate groundwater quality downgradient of previous explorations ATP-10, P13, and TP11, which were terminated in fill containing woody debris at depths ranging from 8 to 15 feet bgs, respectively.

- Install one additional monitoring well (MW15) downgradient of existing well MW9 to evaluate the nature and extent of TPH-D+O detected above the cleanup level in groundwater there. This well will also evaluate groundwater quality downgradient of previous explorations P19 and TP31, which were terminated in fill containing woody debris at depths of 11 and 15 feet bgs, respectively.
- Install one monitoring well (MW16) in the east-central portion of the Subject Property to evaluate groundwater quality downgradient of previous explorations P20 and TP27, which were terminated in fill containing woody debris at depths of 11 and 15 feet bgs, respectively.
- Install one monitoring well (MW17) in the east-central portion of the Subject Property to evaluate groundwater quality near previous exploration TP28, which was terminated in fill containing woody debris at 15 feet bgs.
- Install one monitoring well (MW18) downgradient of existing well MW3 to evaluate the nature and extent of TPH-D+O in groundwater.
- Install one monitoring well (MW19) to evaluate groundwater quality near previous explorations P6 and TP25 where up to 6 feet of fill was observed.
- Install one monitoring well (MW20) in the southeast portion of Parcel C to evaluate groundwater quality south of previous explorations where fill was observed.

- Conduct an initial round of groundwater monitoring and sampling for the groundwater COPCs, extractable and volatile petroleum hydrocarbons (EPH/VPH), total and dissolved organic carbon, and geochemical indicator parameters (Appendix A). Groundwater samples submitted for TPH-D+O analysis will be analyzed both with and without a silica gel cleanup.
- Collect monthly groundwater level measurements from all Subject Property monitoring wells.

Following completion of the work described in Sections 7.4.1 through 7.4.5 to evaluate soil, groundwater, wetland sediment, and surface water quality, the data will be reviewed to determine an ongoing program for quarterly groundwater monitoring and sampling at the Subject Property, as discussed further in Section 7.4.9. Groundwater monitoring and sampling will be completed for a minimum of four quarters to evaluate seasonal variability in groundwater characteristics and quality.

7.4.7 Methane Investigation

The methane investigation will evaluate whether the degradation of buried wood waste is generating methane. The methane investigation will target seven areas of the Subject Property with significant amounts of buried wood debris encountered in previous investigations, as shown on Figure 10. Three monitoring locations will be at existing monitoring wells, and four locations will require installation of new gas probes (Figure 14). The existing monitoring wells consist of MW-2 (near P11 and ATP-8), MW-9 (near P18), and MW-10 (near P19). The existing wells will be monitored for methane by installing wellhead caps with a gas sample port. Four new gas probes will be installed as follows:

- GP-1 with a 3- to 8-foot screen (near ATP-10)
- GP-2 with a 3- to 11-foot screen (near P14)
- GP-3 with a 3- to 8-foot screen (near SS6)
- GP-4 with a 6- to 11-foot screen (near B21)

Methane monitoring will occur under falling barometric conditions. During the baseline monitoring, each monitoring well/gas probe will be monitored for methane, carbon dioxide, oxygen, and hydrogen sulfide. The sampling details are further described in Section A.2.4 of Appendix A.

7.4.8 Fill Soil Investigation and Characterization

Ecology has identified additional areas of the Subject Property where investigation into the presence and quality of fill soil is required to meet the requirements of MTCA. The preliminary locations are depicted on Figure 14 as Fill Investigation Locations and may be modified in the field at the time of the investigation based on access limitations (such as steep grades and/or significant large trees or vegetation) or surface conditions (such as standing water in a wetland or drainage area). A phased approach will be implemented at these locations to understand the nature and extent of fill, as follows:

- A shallow test pit will be excavated to confirm the presence/absence of fill.

    - If fill is not present in the shallow test pit, the field observations will be documented in field notes and photos, the test pit will be backfilled with excavated soil, the objectives of the work will have been met and no further work will be completed.
    - Where fill is observed, the test pit will be advanced to practicable depths to identify the thickness of the fill and the depth to native soil. If native soil is encountered in a test pit, one fill sample will be collected from just above the fill-native soil interface for laboratory analysis of the COPCs.
    - Where fill soil is observed and it is not practicable to determine the thickness of fill through test pit exploration, further investigation will be conducted using drilling exploration methods.
- Drilling exploration will be completed where fill observed in the shallow test pit explorations extends to depths that cannot be practicably or safely determined using excavation methods. Further investigation will consist of advancing soil borings through the fill to native soil.
    - Soil borings will be advanced to total depths corresponding to at least 2 feet below the fill-native soil contact, as identified at the time of drilling.
    - Soil samples will be collected from the fill soil for laboratory analysis of the COPCs, as follows:
        - Fill soil samples will be collected from any vertical interval where field screening results suggest the presence of contaminants (such as PID measurements that are elevated above background, staining, and/or sheen) and/or 1 foot below any observed debris.
        - If field screening results do not identify the presence of contaminants and no debris is observed, one soil sample will be collected from just above the fill-native soil interface for laboratory analysis of the COPCs.

The fill soil investigation results will be used to evaluate the adequacy of the monitoring well network to characterize groundwater at the Subject Property.

7.4.9 Interim Groundwater Network Evaluation

The results of the RI work described in Sections 7.4.1. through 7.4.8, including the initial groundwater monitoring and sampling event at all existing and new monitoring wells, will be summarized in an RI deliverable, the Groundwater Monitoring Well Network Evaluation. A draft report will be submitted to Ecology to describe the nature and extent of fill soil at the Subject Property and evaluate whether the existing monitoring well network is adequate to characterize potential leaching of contaminants from fill to groundwater. The draft report will include exploration logs of test pit and borings, cross sections depicting the understanding of fill and groundwater on the Subject Property, and recommendations for additional monitoring wells that may be warranted to characterize groundwater quality at the Subject Property. This evaluation will include consideration of the lateral and vertical extent of contaminants in groundwater and additional work may be necessary to evaluate deeper groundwater quality if contaminants are confirmed to be present in shallow groundwater and there is the potential for deeper water-bearing units to be affected. The draft report will also outline the approach for ongoing groundwater monitoring and sampling at the Subject Property.

8 Schedule

The overall project schedule, including due dates for project deliverables, is described in Exhibit C of the Agreed Order. The Agreed Order schedule requires that work described in this RI Work Plan commence within 90 days of the effective date of the Agreed Order. A preliminary RI schedule is provided below.

RI Deliverables/Action	Due Dates
Monthly Progress Reports	By the tenth (10th) day of each month following the effective date of the Agreed Order
Complete test pit explorations	Within 60 days of the effective date of the Agreed Order
Complete wetland surface water and sediment sampling	Within 90 days of the effective date of the Agreed Order (as seasonal conditions allow)
Drilling of soil borings for soil sampling, monitoring well and gas monitoring probe construction	Begin within 90 days of the effective date of the Agreed Order
Monitoring well development	Within 10 days of well construction
Initial groundwater monitoring and sampling	No sooner than 10 days but within 30 days of well development
Methane monitoring	Within 30 days of probe construction, as atmospheric conditions allow
Prepared a draft Groundwater Monitoring Well Network Evaluation report	Within 60 days of receipt of validated data from test pits, soil borings, and initial groundwater sampling
Prepare a final Groundwater Monitoring Well Network Evaluation report	Within 30 days of receiving final comments from Ecology on the draft document
Implement any additional tasks identified in the final Groundwater Monitoring Well Network Evaluation report	Within 60 days of Ecology’s approval of the final report
Quarterly groundwater monitoring	Every 90 days following completion of initial groundwater monitoring and sampling

RI Deliverables/Action	Due Dates
*Prepare and submit a draft RI Work Plan Addendum, if required by Ecology	Within 60 days of Ecology's determination
*Prepare and submit a final RI Work Plan Addendum, if required by Ecology	Within 30 days of receiving final comments from Ecology on the draft document
*Implement the RI Work Plan Addendum	Within 90 days of Ecology's approval

*These actions may be repeated if additional RI work is needed to complete the RI.

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Limitations

Work for this project was performed for the Green Cove Park LLC (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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Please refer to Appendix D titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

TABLES

Table 2. Subsurface Conditions Summary

Project No. 210577, 2200 Cooper Point Road NW, Olympia, WA

Exploration Identification	Exploration Date	Source	Fill Present? (Y/N)	Category 1 - reworked soil 2 - wood waste/wood debris 3 - construction debris and/or other debris	Total Depth of Exploration (feet)	Depth to Native (feet bgs)	Presence of Fill (feet, unless noted otherwise)	Fill Thickness (feet)	Subsequent Exploration	Subsurface Observation Notes
P1	10/15/2007[1]	PR-2007	N	none	4	At surface	none	0	--	All native soil, dense till at 27" and harder till at 48"
P2	10/15/2007[1]	PR-2007	Y	1 1	5	33-inches	0-23" 23-33"	2.75	--	Reworked fill and native surface (0-33") over dense till and with loamy fine sand below (33-60")
P3	10/15/2007[1]	PR-2007	Y	1	4	19-inches	0-19"	1.6	--	Fill (0-19") over gravelly over dense till (19-48").
P4	10/15/2007[1]	PR-2007	N	none	5.5	At surface	none	0	--	All native soil, very gravelly dense till at 27"
P5	10/15/2007[1]	PR-2007	Y	1	10	30-inches	0-30"	2.5	--	From 0-30" is old fill - estimated at 50-100 years old. Below that, the buried surface is full of charcoal. The fill is about 40% coarse fragments with sandy loam fine fraction texture and weakly cemented zones.
P6	10/15/2007[1]	PR-2007	Y	1, 2, 3	16	6 feet	0-6	6	--	gravel, sandy loam, woody debris, concrete chunks... Six feet of mixed fill (not structural) overlying very to extremely gravelly sandy substrates.
P7	10/15/2007[1]	PR-2007	Y	1	7	3 feet	0-3	3	--	The surface to about 3 feet depth was mixed from gravel pit activities
P8	10/15/2007[1]	PR-2007	Y	1	15	9-inches	0-9"	0.75	--	The surface was saturated and compacted fill
P9	10/15/2007[1]	PR-2007	N	none	14.5	At surface	none	0	TP-33	The substrate is medium to fine sand from surface to 14.5 feet depth. No gravels. Saturated at 14.5 feet. There was a buried, green plastic, 6" diameter perforated pipe extending to about 15 feet depth that appears to have been either an old monitoring well of some sort or a drain. There was no silica sand screen and no bentonite. Estimated to have been in place at least l 0-20 years. It was full of sand, so long since non-functional.
P10	10/15/2007[1]	PR-2007	Y	1, 2, 3	11	11 feet	0-11	11	B2/MW2; (RI)	Mixed fill (non-structural) to 10 feet depth. Possibly disturbed native at 11 feet. The fill smells of diesel or oil; it has large chunks of concrete, asphalt, large boles of wood and construction debris.
P11	10/15/2007[1]	PR-2007	Y	1, 2	13.5	12 feet	0-12	12	B4/MW4	black, non-native material pushed out of scattered mole holes. Fill to 12 feet depth. Surface 3 feet is compacted and saturated; has a lot of coarse woody debris - 12-18 inch diameter tree boles that may have been placed to create a "corduroy" road surface across the saturated fill. The lowest fill contained oyster shells.
P12	10/15/2007[1]	PR-2007	Y	1 1	10	8 feet	0-8 8-10	8	B5/MW5	0-8 feet of massive random fill; severely compacted and completely impermeable. From 8-10 feet, an old disturbed sandy native surface.
P13	10/15/2007[1]	PR-2007	Y	1 3 2	11	Not encountered	0-4 4-10 10-11+	11+	B6/MW6; (RI)	0-4 feet was relatively clean loamy sand fill. From 4-10 feet, the fill was old asphalt and concrete-structural fill. From 10-11 feet (pit base) - loose 100% woody debris. Did not reach native material.
P14	10/15/2007[1]	PR-2007	Y	1 2, 3 3	12	12	0-2 2-12 8-11	11	B7/MW7	0-2 feet is mottled sandy loam and loam sand mixed; no woody debris. From 2- 12 feet - mixed fill with large logs, chunks of concrete and asphalt (2 feet or more in diameter), rebar; metal strips, cedar planks. Most of the asphalt and concrete debris is at 8-11 feet depth. The substrate below 12 feet was coarse sand, and appears to be native material.

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P15	10/15/2007[1]	PR-2007	Y	1	7	7 feet	0-1	7	B8/MW8	Top foot is mottled sandy loam. From 1-7 feet, mixed extremely gravelly sandy loam fill with about 15% woody debris. Fill includes concrete chunks; burn debris, and the base of the fill slopes deeper to the south. So it appears we are digging at the northern edge of a deeper fill hole. Below 7 feet depth, the substrate is native material - extremely gravelly loamy sand with color suggesting that it might once have been within about 3 feet of a native surface. The substrates are seeping rapidly and saturated below 7 feet depth (fill interface).
				1, 2, 3			1-7			
P16	10/15/2007[1]	PR-2007	Y	1	12	32-inches	0-32"	2.7	--	The surface is clean fill - extremely gravelly loam sand with no wood and no garbage
P17	10/15/2007[1]	PR-2007	Y	1, 3	10	Not encountered	0-6	11	B3/MW3	This pit had fill to 10+ feet. From 0-6 feet, the upper fill was mixed sandy loam with construction debris and a strong odor of diesel or oil. Below 6 feet, the fill was mostly large logs and lumber, possibly from an old log building. The lumber was squared off logs with notched ends - most pieces about 6-8 feet long (RR ties?). The pit base at 10 feet was still in fill, but was saturated, so we stopped digging since the fill pit sidewalls were unstable.
				1, 2			6-10+			
P18	10/15/2007[1]	PR-2007	Y	1, 2, 3	15	9 feet	0-7	9	B9/MW9	0-7 feet: Relatively clean very gravelly sandy loam fill, massive and mixed with minor amounts of wire, coarse wood, etc. Seeping at 7 feet. 7-9 feet: Older fill with about 60% by volume coarse and fine woody debris and other fill material, including an old tire sidewall. 9-15 feet: The substrate was gleyed and mottled massive coarse sandy loam. Colors indicate saturation, but it is not saturated today. This material is possibly a native material base, but is disturbed and mixed.
				1, 2, 3			7-9			
				1			9-15			
P19	10/15/2007[1]	PR-2007	Y	1	11	Not encountered	0-30"	11	B10/MW10; (RI)	0-30 inches: Massive, dark-brown fine sandy loam fill. 30-40 inches: Massive, severely gleyed silt loam fill. 40 inches to 11 feet: Older fill with dark brownish black color and a great deal of bark (about 25%). The balance is very gravelly sandy loam fill. Possibly a place where logs were stripped of bark?
				1			30-40"			
				1, 2			40"-11+ ft			
P20	10/15/2007[1]	PR-2007	Y	1	11	Not encountered	0-26"	15	(RI)	0-26 inches: Massive, dark-brown fine sandy loam fill. 26-36 inches: Massive, severely gleyed silt loam fill. 36 inches to 11 feet: Older fill with dark brownish black color and a great deal of bark (about 25%). The balance is very gravelly sandy loam fill. 11 feet+: started to hit a lighter colored layer with concrete chunks.
				1			26-36"			
				1, 2			36"-11 ft			
				1, 3			11 ft +			

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P21	10/15/2007[1]	PR-2007	Y	1	12	6 feet	0-13"	6	--	0-13 in: Very gravelly sandy loam/ loamy sand fill surface; brown colored 13-30 in: Very gravelly sandy loam/ loamy sand fill; gleyed and mottled (suggesting seasonal saturation) 30 in to 6 ft: dark brown very gravelly sandy loam with about 10% metal debris 6 ft to 12 ft: Extremely gravelly coarse sand - almost blue in color
				1			13-30"			
				1, 3			30" - 6 ft			
TP1	1/7/2008	RNS-2008	Y	NA	Unknown	7 feet	0-7	7	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP2	1/7/2008	RNS-2008	Y	NA	Unknown	3 feet	0-3	3	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP3	1/7/2008	RNS-2008	Y	1, 2	Unknown	3 feet	0-3	3	--	"...while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31."
TP4	1/7/2008	RNS-2008	Y	NA	Unknown	9 feet	0-9	9	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP5	1/7/2008	RNS-2008	Y	NA	Unknown	Not encountered	0-15+	15	B3/MW3	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP6	1/7/2008	RNS-2008	Y	NA	Unknown	Not encountered	0-15+	15	B3/MW3	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP7	1/7/2008	RNS-2008	Y	NA	Unknown	Not encountered	0-15+	15	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP8	1/7/2008	RNS-2008	Y	NA	Unknown	9 feet	0-9	9	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP9	1/11/2008	RNS-2008	Y	NA	Unknown	7 feet	0-7	7	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP10	1/11/2008	RNS-2008	Y	NA	Unknown	Not encountered	0-15+?	15?	B7/MW7; B17	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP11	1/11/2008	RNS-2008	Y	1, 2	Unknown	Not encountered	0-15+	15	(RI)	"...while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31. Test Pit 11 has a thicker layer of wood chips from five to eight feet bgs...Field screening of these pits did not indicate the presence of contaminants".
TP12	1/11/2008	RNS-2008	Y	NA	Unknown	Not encountered	0-15+	15	(RI)	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP13	1/11/2008	RNS-2008	N	none	Unknown	At surface	none	0	--	Recessional outwash (native)
TP14	1/11/2008	RNS-2008	Y	NA	Unknown	9 feet	0-9	9	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP15	1/11/2008	RNS-2008	Y	NA	Unknown	7 feet	0-7	7	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP16	1/11/2008	RNS-2008	Y	NA	Unknown	3.5 feet	0-3.5	3.5	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP17	1/11/2008	RNS-2008	Y	1, 2	Unknown	7 feet	0-7	7	--	while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31...Test Pits 11, 17, and 32 had a higher occurrence of construction debris and/or solid waste than the other test pits. Field screening of these pits did not indicate the presence of contaminants."
TP18	1/11/2008	RNS-2008	Y	NA	Unknown	3 feet	0-3	3	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP19	1/11/2008	RNS-2008	Y	1, 2	Unknown	3 feet	0-3	3	--	"...while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31".
TP20	1/11/2008	RNS-2008	Y	NA	Unknown	7 feet	0-7	7	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP21	1/11/2008	RNS-2008	Y	1, 2	Unknown	9 feet	0-9	9	--	"...while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31".
TP22	1/11/2008	RNS-2008	Y	NA	Unknown	Not encountered	0-15+	15	(RI)	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP23	1/11/2008	RNS-2008	Y	NA	Unknown	8 feet	0-8	8	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP24	1/11/2008	RNS-2008	Y	NA	Unknown	3 to 5 feet	3-5	3-5	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP25	1/11/2008	RNS-2008	Y	NA	Unknown	3 to 5 feet	3-5	3-5	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP26	1/11/2008	RNS-2008	Y	NA	Unknown	7.5 feet	7.5	7.5	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP27	1/11/2008	RNS-2008	Y	1, 2	Unknown	Not encountered	0-15+	15	(RI)	"...while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31".
TP28	1/11/2008	RNS-2008	Y	1, 2	Unknown	Not encountered	0-15+	15	(RI)	"...while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31".

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TP29	1/11/2008	RNS-2008	Y	NA	Unknown	Not encountered	0-15+	15	(RI)	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP30	1/11/2008	RNS-2008	Y	NA	Unknown	3 to 5 feet	3-5	3-5	--	no soil descriptions provided, fill thickness approx. from Fig. 4 (RNS 2008)
TP31	1/11/2008	RNS-2008	Y	1, 2	Unknown	Not encountered	0-15+	15	(RI)	"...while wood debris was found in 20 of the test pits, a considerable amount was found in Test Pits 3, 11, 17, 19, 21, 27, 28, and 31...Test Pit 31 has a layer consisting of approximately 20% wood chips from five to twelve feet bgs".
TP32	1/11/2008	RNS-2008	Y	1, 3	Unknown	Not encountered	0-15+	15	(RI)	"Test Pits 11, 17, and 32 had a higher occurrence of construction debris and/or solid waste than the other test pits. Field screening of these pits did not indicate the presence of contaminants".
TP33	1/11/2008	RNS-2008	N	none	Unknown	At surface	none	0	--	Recessional outwash (native)
ATP-1	12/23/2014	Ages 2015	Y	1	10	1 foot	0-1	1	--	Fill: sand with silt and gravel, trace topsoil, loose, moist.
ATP-2	12/23/2014	Ages 2015	Y	1, 2	9	4 feet	0-4	4	--	Fill: topsoil, sand, gravel, tree roots, woody debris, loose, moist.
ATP-3	12/23/2014	Ages 2015	Y	1	9	4	0-4	4	--	Gray mottled orange SAND with silt and gravel, cobbles to 6 inches, medium dense, moist, (SP-SM) (Outwash) (Possible Old Fill).
				1			4-5			Gray SAND with silt and gravel, medium dense, moist, (SP-SM) (Outwash) (Possible Old Fill).
ATP-4	12/23/2014	Ages 2015	Y	1	9	4	0-1.5	4	--	Fill: Brown and tan silty sand with gravel, loose, moist.
				1			1.5-2.5			Fill: Brown sand with silt and gravel, some topsoil, loose, moist.
				1			2.5-4			Fill: Blueish-gray sandy silt, loose, moist.
ATP-5	12/23/2014	Ages 2015	Y	1	12	11	0-3	11	B12	Fill: Alternating layers of Brown silty sand with gravel and bluish-gray silt with sand, loose, moist.
				1, 2			3-11			Fill: Topsoil, gravel, sand, tree roots, woody debris, and occasional large pieces of wood, loose, moist. Native outwash at 11.
ATP-6	12/24/2014	Ages 2015	Y	1, 2	10	Not encountered	0-10+	10+	--	Fill: Topsoil, gravel, sand, garbage, tree roots, woody debris, loose, moist.
ATP-7	12/24/2014	Ages 2015	Y	1	10	1	0-1	1	--	Fill: Sand, silt, gravel, and topsoil, loose, moist.
ATP-8	12/24/2014	Ages 2015	Y	1, 2	13	12	0-12	12	--	Fill: Alternating layers of brown silty gravel with sand, brown silty sand with gravel, bluish-gray silt with sand and gravel, and topsoil with woody debris, loose, moist. Native outwash at 12 feet.
ATP-9	12/24/2014	Ages 2015	Y	1	8	6.5	0-3	6.5	--	Tan, SAND with silt and gravel, cobbles to 3 inches, medium dense, moist. (SP-SM) (Outwash) (Possible Old Fill)
				1			3-6.5			Gray SAND with silt and gravel, medium dense, moist. (SP-SM) (Outwash) (Possible Old Fill).
ATP-10	12/24/2014	Ages 2015	Y	1, 2	8	Not encountered	0-1	8+	(RI)	Fill: Topsoil, woody debris
				1			1-2.5			Fill: Brown to reddish-orange silty sand with gravel, loose, moist.
				1, 2			2.5-8+			Fill: Topsoil, gravel, sand, silt, cobbles to 6 inches, woody debris, loose, moist. Large logs from 7 to 8 feet. Test Hole terminated at a depth of 8.0 feet due to large logs.
ATP-11	12/24/2014	Ages 2015	N	none	8	At surface	none	0	--	Topsoil (0-0.5'). Reddish-orange silty SAND with gravel, medium dense, moist. (SM)
ATP-12	12/24/2014	Ages 2015	N	none	7	0	none	0	--	Outwash
ATP-13	12/24/2014	Ages 2015	N	none	5	0	none	0	--	Outwash
B1/MW1	11/9/2020	ENPRO 2021	N	none	15	0	none	0	--	Topsoil (organic silts with gravel) overlying silt and sand with rounded gravel and cobbles (all native).
B2/MW2	11/10/2020	ENPRO 2021	N	none	15	0	none	0	--	Sandy silt overlying clay, both with gravel and cobbles, to 9 ft bgs, overlying sand (all native).
B3/MW3	11/9/2020	ENPRO 2021	Y	1, 2	15	11	0-11	11	--	Fill: 2 feet topsoil over 9 feet of organic silt, buried wood, and cobbles. Native at 11 feet is silty, sandy gravel.
B4/MW4	11/9/2020	ENPRO 2021	N	none	15	0	none	0	--	Topsoil (native silty sand and gravel) over 13 feet of well-sorted sand (all native).
B5/MW5	11/10/2020	ENPRO 2021	Y	1,2,3	15	5.5	0-5.5	5.5	--	Fill: 2 feet silty, sandy gravel over 3.5 feet of black clay with gravel (interpreted as buried fill with wood) and small metal fragments. Native at 5.5 feet bgs is sand.
B6/MW6	11/10/2020	ENPRO 2021	Y	1	15	7	0-7	7	--	Fill: sandy silt with gravel, cobbles, and asphalt. Native at 7 feet bgs is sand.
B7/MW7	11/10/2020	ENPRO 2021	Y	1,2,3	15	10	0-10	10	--	Fill: sandy silt, clay, and gravel with concrete and woody debris. Native at 10 feet bgs is sand.
B8/MW8	11/9/2020	ENPRO 2021	Y	1,2,3	15	6	0-6	6	--	Fill: silt and sand with gravel and cobbles, woody debris/fragments, and concrete. Native at 6 feet is gravel with silt and sand.

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B9/MW9	11/9/2020	ENPRO 2021	Y	1,2,3	15	7.5	0-7.5	7.5	--	Fill: silty sand with gravel, woody debris/fragments, and concrete. Native at 7.5 feet bgs is silt and silty sand with sand and gravel.
B10/MW10	11/9/2020	ENPRO 2021	Y	1,2	15	7	0-7	7	--	Fill: organic clay with gravel over gravelly fill with woody debris. Native at 7 feet bgs is poorly-graded gravel and sand.
B11/MW11	11/9/2020	ENPRO 2021	N	none	15	0	none	0	--	Silty gravel over clean, dense clay grading to sand.
B12	6/24/2021	AEG 2021	NA	NA	15	3.5	0-3.5	3.5	--	0-3.5': sand with gravel and silt (SP/SP-SM) (fill or reworked native) 3.5-15': gravel with sand (GP) (native outwash)
B13	6/24/2021	AEG 2021	NA	NA	15	At surface	none	0	--	0-15': sand with gravel (SP) (native outwash)
B14	6/24/2021	AEG 2021	NA	NA	15	3.5	0-3.5	3.5	--	0-3.5': sand with gravel and silt (SP/SP-SM) (fill or reworked native) 3.5-10.5': gravel with sand (GP) (native outwash) 10.5-15': sand (SW) (native outwash)
B15	6/24/2021	AEG 2021	NA	NA	15	3.5	0-3.5	3.5	--	0-3.5': sand with gravel and silt (SP/SP-SM) (fill or reworked native) 3.5-10.5': gravel with sand (GP) (native outwash) 10.5-15': sand with gravel (SP) (native outwash)
B16	6/24/2021	AEG 2021	NA	NA	15	At surface	none	0	--	0-5.5': sand with gravel (SP) (reworked native) 5.5-10.5': gravel with sand (GP) (native outwash) 10.5-15': sand (SP) (native outwash)
B17	6/25/2021	AEG 2021	NA	NA	15	At surface	none	0	--	0-15': sand and gravel (SP/GP) (native outwash)
B18	6/25/2021	AEG 2021	NA	NA	20	6	0-6	6	--	0-6': sand with gravel and silt (SP/SP-SM) (fill or reworked native) 6-20': sand and gravel (SP/GP) (native outwash)
B19	6/25/2021	AEG 2021	NA	NA	20	6	0-6	6	--	0-6': sand with gravel and silt (SP/SP-SM) (fill or reworked native) 6-20': sand and gravel (SP/GP) (native outwash)
B20	6/25/2021	AEG 2021	NA	NA	15	6	0-6	6	--	0-6': sand with gravel and silt (SP/SP-SM) (fill or reworked native) 6-9': gravel with sand (GP) (native outwash) 9-15': clay (native)
B21	6/25/2021	AEG 2021	NA	NA	NA	6	0-6	6	--	0-6': sand with gravel and silt (SP/SP-SM) (fill or reworked native) 6-15': sand and gravel (SP/GP) (native outwash)

Notes

"--" - not applicable

bgs - below ground surface

NA - not available

(RI) - indicates proposed exploration

This table presents a summary of subsurface conditions observed in previous explorations completed by others. The source documents should be referenced for additional details.

[1]The Pacific Rim soils report indicates that the investigation work was conducted '…over a period of about a week in mid-October, 2007". The exact dates are not known.

Table 3. Summary of Historical Soil Data

Project No. 220577 , 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	TP1	TP2	TP2	TP3	TP4	TP5	TP6	TP7	TP8	TP9	TP11	TP12	TP13	TP14
	Sample Date	01/07/2008	01/07/2008	01/07/2008	01/07/2008	01/07/2008	01/07/2008	01/07/2008	01/07/2008	01/07/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008
	Sample Identification	SETP1-1	SETP2-1	SETP2-2	SETP3-1	SETP4-1	SETP5-1	SETP6-1	SETP7-1	SETP8-1	SETP9-1	SETP11-1	SETP12-1	SETP13-1	SETP14-1
	Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Analyte (by constituent group)	**MTCA Soil Cleanup Levels for Unrestricted Land Use[1]**														
Total Petroleum Hydrocarbons															
Gasoline-Range Organics	100	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Diesel-Range Organics	2000	50 U	50 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Motor Oil-Range Organics	2000	100 U	100 U	100 U	100 U	100 U	100 U	**370**	100 U	100 U	100 U	100 U	100 U	100 U	100 U

Notes

All results in milligrams per kilogram

[1]Washington State Model Toxics Control Act (MTCA) Method A or B Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340)

U - Analyte not detected at or above the RL shown

Table 3. Summary of Historical Soil Data
Project No. 220577 , 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		TP15	TP16	TP17	TP18	TP19	TP20	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28
Sample Date		01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008
Sample Identification		SETP15-1	SETP16-1	SETP17-1	SETP18-1	SETP19-1	SETP20-1	SETP21-1	SETP22-1	SETP23-1	SETP24-1	SETP25-1	SETP26-1	SETP27-1	SETP28-1
Sample Depth		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Analyte (by constituent group)	**MTCA Soil Cleanup Levels for Unrestricted Land Use[1]**														
Total Petroleum Hydrocarbons															
Gasoline-Range Organics	100	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Diesel-Range Organics	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Motor Oil-Range Organics	2000	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U

Notes

All results in milligrams per kilogram

[1]Washington State Model Toxics Control Act (MTCA) Method A or B Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340)

U - Analyte not detected at or above the RL shown

Table 3. Summary of Historical Soil Data

Project No. 220577 , 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	TP29	TP30	TP31	TP32	TP32	TP33
	Sample Date	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008	01/11/2008
	Sample Identification	SETP29-1	SETP30-1	SETP31-1	SETP32-1	SETP32-2	SETP33-1
	Sample Depth	-	-	-	-	-	-
Analyte (by constituent group)	**MTCA Soil Cleanup Levels for Unrestricted Land Use[1]**						
Total Petroleum Hydrocarbons							
Gasoline-Range Organics	100	20 U	20 U	20 U	20 U	20 U	20 U
Diesel-Range Organics	2000	50 U	50 U	50 U	50 U	50 U	50 U
Motor Oil-Range Organics	2000	100 U	100 U	100 U	100 U	100 U	100 U

Notes

All results in milligrams per kilogram

[1]Washington State Model Toxics Control Act (MTCA) Method A or B Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340)

U - Analyte not detected at or above the RL shown

Table 4. Surface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		SS1	SS2	SS2A	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12	SS13	SS14	SS15	SS16	SS17	SS18	SS19	SS20	SS20A	SS21	SS22	SS23	SS24	SS25
Sample Date		11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020
Sample Identification		SS1	SS2	SS2-A[2]	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12	SS13	SS14	SS15	SS16	SS17	SS18	SS19	SS20	SS20-A	SS21	SS22	SS23	SS24	SS25
Sample Depth[1]		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]																											
Total Petroleum Hydrocarbons																												
Gasoline-Range Organics	100	6.8 U	5.1 U	4.5 U	5.5 U	3.9 U	4.4 U	4.6 U	12 U	6.1 U	4.0 U	7.8 U	12 U	9.9 U	4.9 U	6.0 U	8.1 U	7.1 U	5.0 U	4.2 U	3.8 U	4.7 U	6.0 U	3.5 U	4.5 U	6.4 U	4.5 U	5.5 U
Diesel-Range Organics	2000	**150**	31 U	29 U	30 U	28 U	28 U	31 U	43 U	34 U	28 U	36 U	**65**	38 U	31 U	30 U	32 U	30 U	29 U	28 U	27 U	31 U	31 U	27 U	29 U	35 U	32 U	32 U
Motor Oil-Range Organics	2000	**1800**	63 U	57 U	**130**	**77**	**80**	**73**	**190**	69 U	57 U	**170**	**650**	**130**	61 U	**69**	**95**	60 U	57 U	57 U	53 U	62 U	62 U	54 U	59 U	70 U	**280**	**160**
TPH-D+O (ND = 1/2 RL)	2000	**1950**	**ND**	**ND**	**145**	**91**	**94**	**88.5**	**212**	**ND**	**ND**	**188**	**715**	**130**	**ND**	**84**	**111**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**296**	**176**
Benzene, Toluene, Ethylbenzene, and Xylenes																												
Benzene	0.03	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.024 U	0.020 U	0.020 U	0.020 U	0.024 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Toluene	7	0.068 U	0.051 U	0.045 U	0.055 U	0.039 U	0.044 U	0.046 U	0.12 U	0.061 U	0.040 U	0.078 U	0.12 U	0.099 U	0.049 U	0.060 U	0.081 U	0.071 U	0.050 U	0.042 U	0.038 U	0.047 U	0.060 U	0.035 U	0.045 U	0.064 U	0.045 U	0.055 U
Ethylbenzene	6	0.068 U	0.051 U	0.045 U	0.055 U	0.039 U	0.044 U	0.046 U	0.12 U	0.061 U	0.040 U	0.078 U	0.12 U	0.099 U	0.049 U	0.060 U	0.081 U	0.071 U	0.050 U	0.042 U	0.038 U	0.047 U	0.060 U	0.035 U	0.045 U	0.064 U	0.045 U	0.055 U
Total Xylenes	9	0.068 U	0.051 U	0.045 U	0.055 U	0.039 U	0.044 U	0.046 U	0.12 U	0.061 U	0.04 U	0.078 U	0.12 U	0.099 U	0.049 U	0.06 U	0.081 U	0.071 U	0.05 U	0.042 U	0.038 U	0.047 U	0.06 U	0.035 U	0.045 U	0.064 U	0.045 U	0.055 U
Metals																												
Arsenic	20	--	--	--	**15**	11 U	11 U	12 U	17 U	14 U	11 U	14 U	18 U	15 U	12 U	12 U	13 U	12 U	11 U	11 U	11 U	12 U	12 U	11 U	12 U	14 U	13 U	13 U
Barium	16000	--	--	--	**84**	**60**	**44**	**63**	**110**	**85**	**40**	**180**	**89**	**70**	**28**	**55**	**64**	**30**	**48**	**37**	**46**	**66**	**71**	**28**	**57**	**56**	**48**	**61**
Cadmium	2	--	--	--	**0.62**	0.56 U	0.56 U	**0.84**	0.85 U	0.69 U	0.57 U	0.72 U	0.90 U	0.75 U	0.61 U	0.61 U	0.64 U	0.60 U	0.57 U	0.57 U	0.53 U	0.62 U	0.62 U	0.54 U	0.58 U	0.70 U	0.65 U	0.64 U
Chromium	--	--	--	--	**31**	**21**	**16**	**21**	**34**	**24**	**16**	**39**	**21**	**20**	**16**	**23**	**25**	**31**	**20**	**21**	**17**	**29**	**29**	**18**	**26**	**25**	**23**	**23**
Copper	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11**	**12**	**17**	**17**	**7.5**	**19**	**13**	--	--
Lead	250	**17**	--	--	**130**	**18**	5.6 U	**16**	**15**	**9**	5.7 U	**17**	**11**	**8.5**	6.1 U	**8.1**	**11**	6.0 U	5.7 U	5.7 U	5.3 U	6.2 U	6.2 U	5.4 U	5.8 U	7.0 U	**8.5**	**35**
Mercury	2	--	--	--	0.30 U	0.28 U	0.28 U	0.31 U	0.42 U	0.34 U	0.28 U	0.36 U	0.45 U	0.38 U	0.31 U	0.30 U	0.32 U	0.30 U	0.28 U	0.28 U	0.27 U	0.31 U	0.31 U	0.27 U	0.29 U	0.35 U	0.32 U	0.32 U
Selenium	400	--	--	--	12 U	11 U	11 U	12 U	17 U	14 U	11 U	14 U	18 U	15 U	12 U	12 U	13 U	12 U	11 U	11 U	11 U	12 U	12 U	11 U	12 U	14 U	13 U	13 U
Silver	400	--	--	--	1.2 U	1.1 U	1.1 U	1.2 U	1.7 U	1.4 U	1.1 U	1.4 U	1.8 U	1.5 U	1.2 U	1.2 U	1.3 U	1.2 U	1.1 U	1.1 U	1.1 U	1.2 U	1.2 U	1.1 U	1.2 U	1.4 U	1.3 U	1.3 U
Chromium (VI)	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Semivolatile Organic Compounds																												
Hexachlorobutadiene	13	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.60 U	--	--	0.39 U	0.59 U	0.31 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
Pentachlorophenol	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.19 U	0.18 U	0.21 U	0.21 U	0.18 U	0.19 U	0.23 U	--	--
Polycyclic Aromatic Hydrocarbons (PAHs)																												
1-Methylnaphthalene	34	0.0080 U	--	--	0.016 U	0.0075 U	0.0075 U	0.0082 U	0.011 U	--	0.0076 U	0.0096 U	**0.037**	**0.026**	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	0.0078 U	0.0093 U	**0.13**	0.0085 U
2-Methylnaphthalene	320	0.0080 U	--	--	**0.044**	0.0075 U	0.0075 U	0.0082 U	0.011 U	--	0.0076 U	0.0096 U	**0.078**	**0.017**	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	0.0078 U	0.0093 U	**0.090**	0.0085 U
Acenaphthene	4800	0.0080 U	--	--	0.016 U	0.0075 U	0.0075 U	0.0082 U	0.011 U	--	0.0076 U	0.0096 U	**0.027**	0.010 U	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	0.0078 U	0.0093 U	**0.036**	0.0085 U
Acenaphthylene	--	0.0080 U	--	--	**0.045**	**0.017**	0.0075 U	0.0082 U	0.011 U	--	0.0076 U	**0.024**	**0.089**	0.010 U	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	0.0078 U	0.0093 U	**0.040**	0.0085 U
Anthracene	24000	0.0080 U	--	--	**0.056**	**0.014**	0.0075 U	**0.011**	**0.013**	--	0.0076 U	**0.026**	**0.22**	0.010 U	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.014**	0.0093 U	**0.033**	0.0085 U
Benzo(g,h,i)perylene		0.0080 U	--	--	**0.074**	**0.028**	0.0075 U	**0.037**	0.011 U	--	0.0076 U	**0.055**	**0.19**	0.010 U	0.0081 U	0.0081 U	**0.024**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.042**	0.0093 U	**0.023**	0.0085 U
Fluoranthene	3200	**0.014**	--	--	**0.17**	**0.066**	**0.012**	**0.077**	**0.043**	--	0.0076 U	**0.050**	**0.52**	**0.015**	0.0081 U	**0.012**	**0.060**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.17**	0.0093 U	**0.062**	0.0085 U
Fluorene	3200	0.0080 U	--	--	0.016 U	0.0075 U	0.0075 U	0.0082 U	0.011 U	--	0.0076 U	0.0096 U	**0.042**	0.010 U	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	0.0078 U	0.0093 U	**0.046**	0.0085 U
Naphthalene	5	**0.010**	--	--	**0.081**	0.0075 U	0.0075 U	**0.015**	0.011 U	--	0.0076 U	0.0096 U	**0.12**	**0.014**	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	0.0078 U	**0.016**	**0.078**	0.0085 U
Phenanthrene	--	**0.013**	--	--	**0.10**	**0.037**	**0.011**	**0.053**	**0.016**	--	0.0076 U	**0.016**	**0.40**	**0.054**	0.0081 U	**0.012**	**0.036**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.11**	0.0093 U	**0.25**	0.0085 U
Pyrene	2400	**0.015**	--	--	**0.17**	**0.090**	**0.014**	**0.081**	**0.042**	--	0.0076 U	**0.042**	**0.39**	**0.022**	0.0081 U	**0.013**	**0.066**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.15**	0.0093 U	**0.11**	0.0085 U
Carcinogenic PAHs																												
Benz(a)anthracene	--	0.0080 U	--	--	**0.074**	**0.037**	0.0075 U	**0.044**	**0.019**	--	0.0076 U	**0.058**	**0.61**	0.010 U	0.0081 U	0.0081 U	**0.032**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.051**	0.0093 U	**0.032**	0.0085 U
Benzo(a)pyrene	0.1	**0.0093**	--	--	**0.089**	**0.046**	**0.0084**	**0.050**	**0.016**	--	0.0076 U	**0.056**	**0.33**	0.010 U	0.0081 U	0.0081 U	**0.039**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.062**	0.0093 U	**0.029**	0.0085 U
Benzo(b)fluoranthene	--	**0.014**	--	--	**0.10**	**0.044**	**0.012**	**0.071**	**0.033**	--	0.0076 U	**0.15**	**0.89**	0.010 U	0.0081 U	**0.011**	**0.048**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.081**	0.0093 U	**0.031**	0.0085 U
Benzo(j,k)fluoranthene	--	0.0080 U	--	--	**0.031**	**0.016**	0.0075 U	**0.019**	0.011 U	--	0.0076 U	**0.031**	**0.26**	0.010 U	0.0081 U	0.0081 U	**0.015**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.031**	0.0093 U	0.0086 U	0.0085 U
Chrysene	--	**0.015**	--	--	**0.081**	**0.044**	**0.0083**	**0.049**	**0.042**	--	0.0076 U	**0.088**	**0.99**	**0.011**	0.0081 U	**0.0085**	**0.040**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.067**	0.0093 U	**0.048**	**0.012**
Dibenzo(a,h)anthracene	--	0.0080 U	--	--	0.016 U	0.0075 U	0.0075 U	0.0082 U	0.011 U	--	0.0076 U	**0.016**	**0.06**	0.010 U	0.0081 U	0.0081 U	0.0086 U	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.010**	0.0093 U	0.0086 U	0.0085 U
Indeno(1,2,3-cd)pyrene	--	0.0080 U	--	--	**0.067**	**0.028**	0.0075 U	**0.038**	**0.013**	--	0.0076 U	**0.066**	**0.15**	0.010 U	0.0081 U	0.0081 U	**0.024**	0.0080 U	0.0076 U	0.0076 U	0.0071 U	0.0083 U	0.0083 U	0.0072 U	**0.041**	0.0093 U	**0.014**	0.0085 U
Total cPAHs TEQ[4]	0.1	**0.012**	--	--	**0.12**	**0.059**	**0.011**	**0.068**	**0.024**	--	ND	**0.089**	**0.54**	**0.00761**	ND	**0.0069**	**0.052**	ND	ND	ND	ND	ND	ND	ND	**0.081**	ND	**0.038**	**0.0065**
Polychlorinated Biphenyls																												
Aroclor 1016	5.6	0.060 U	--	--	0.059 U	0.056 U	0.056 U	0.061 U	0.085 U	--	--	0.072 U	0.090 U	0.075 U	--	0.061 U	--	--	--	--	--	--	--	--	--	--	0.065 U	0.064 U
Aroclor 1221	--	0.060 U	--	--	0.059 U	0.056 U	0.056 U	0.061 U	0.085 U	--	--	0.072 U	0.090 U	0.075 U	--	0.061 U	--	--	--	--	--	--	--	--	--	--	0.065 U	0.064 U
Aroclor 1232	--	0.060 U	--	--	0.059 U	0.056 U	0.056 U	0.061 U	0.085 U	--	--	0.072 U	0.090 U	0.075 U	--	0.061 U	--	--	--	--	--	--	--	--	--	--	0.065 U	0.064 U
Aroclor 1242	--	0.060 U	--	--	0.059 U	0.056 U	0.056 U	0.061 U	0.085 U	--	--	0.072 U	0.090 U	0.075 U	--	0.061 U	--	--	--	--	--	--	--	--	--	--	0.065 U	0.064 U
Aroclor 1248	--	0.060 U	--	--	0.059 U	0.056 U	0.056 U	0.061 U	0.085 U	--	--	0.072 U	0.090 U	0.075 U	--	0.061 U	--	--	--	--	--	--	--	--	--	--	0.065 U	0.064 U
Aroclor 1254	0.5	0.060 U	--	--	0.059 U	0.056 U	0.056 U	0.061 U	0.085 U	--	--	0.072 U	0.090 U	0.075 U	--	0.061 U	--	--	--	--	--	--	--	--	--	--	0.065 U	0.064 U
Aroclor 1260	0.5	0.060 U	--	--	0.059 U	0.056 U	0.056 U	0.061 U	0.085 U	--	--	0.072 U	0.090 U	0.075 U	--	0.061 U	--	--	--	--	--	--	--	--	--	--	0.065 U	0.064 U
Volatile Organic Compounds																												
1,1,1,2-Tetrachloroethane	38	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,1,1-Trichloroethane	2	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,1,2,2-Tetrachloroethane	5	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,1,2-Trichloroethane	18	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,1-Dichloroethane	180	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,1-Dichloroethene	4000	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,1-Dichloropropene	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,2,3-Trichlorobenzene	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,2,3-Trichloropropane	0.0063	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,2,4-Trichlorobenzene	34	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,2-Dibromo-3-chloropropane	1.3	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.60 U	--	--	0.39 U	0.59 U	0.31 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
1,2-Dibromoethane (EDB)	0.005	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,2-Dichlorobenzene	7200	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,2-Dichloroethane (EDC)	11	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,2-Dichloropropane	27	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,3-Dichlorobenzene	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
1,3-Dichloropropane	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U

Table 4. Surface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	SS1	SS2	SS2A	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12	SS13	SS14	SS15	SS16	SS17	SS18	SS19	SS20	SS20A	SS21	SS22	SS23	SS24	SS25
	Sample Date	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020
	Sample Identification	SS1	SS2	SS2-A[2]	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12	SS13	SS14	SS15	SS16	SS17	SS18	SS19	SS20	SS20-A	SS21	SS22	SS23	SS24	SS25
	Sample Depth[1]	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]																											
1,4-Dichlorobenzene	190	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
2,2-Dichloropropane	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
2-Chloroethyl Vinyl Ether	--	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.0079 U	--	--	0.0054 U	0.0085 U	0.0047 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
2-Chlorotoluene	1600	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
4-Chlorotoluene	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Bromobenzene	640	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.12 U	--	--	0.078 U	0.12 U	0.062 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Bromochloromethane	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Bromodichloromethane	16	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Bromoform	130	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.0079 U	--	--	0.0054 U	0.0085 U	0.0047 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
Bromomethane	110	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.0079 U	--	--	0.0054 U	0.0085 U	0.0047 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
Carbon Tetrachloride	14	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Chlorobenzene	1600	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Chloroethane	--	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.0079 U	--	--	0.0054 U	0.0085 U	0.0047 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
Chloroform	32	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Chloromethane	--	0.010 U	--	--	0.0081 U	0.0089 U	0.0078 U	0.0095 U	0.012 U	--	--	0.0083 U	0.013 U	0.0072 U	--	0.0039 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
cis-1,2-Dichloroethene (cDCE)	160	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
cis-1,3-Dichloropropene	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Dibromochloromethane	12	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Dibromomethane	800	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Dichlorodifluoromethane	16000	0.0024 U	--	--	0.0019 U	0.0021 U	0.0018 U	0.0022 U	0.0028 U	--	--	0.0019 U	0.0031 U	0.0017 U	--	0.00091 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
m,p-Xylenes	16000	0.068 U	0.051 U	0.045 U	0.055 U	0.039 U	0.044 U	0.046 U	0.12 U	0.061 U	0.040 U	0.078 U	0.12 U	0.099 U	0.049 U	0.060 U	0.081 U	0.071 U	0.050 U	0.042 U	0.038 U	0.047 U	0.060 U	0.035 U	0.045 U	0.064 U	0.045 U	0.055 U
Methyl tert-butyl ether (MTBE)	0.1	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Methylene Chloride	0.02	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.0079 U	--	--	0.0054 U	0.0085 U	0.0047 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
Methyliodide	--	0.0067 U	--	--	0.0052 U	0.0058 U	0.0051 U	0.0062 U	0.0079 U	--	--	0.0054 U	0.0085 U	0.0047 U	--	0.0025 U	--	--	--	--	--	--	--	--	--	--	0.0024 U	0.0027 U
o-Xylene	16000	0.068 U	0.051 U	0.045 U	0.055 U	0.039 U	0.044 U	0.046 U	0.12 U	0.061 U	0.040 U	0.078 U	0.12 U	0.099 U	0.049 U	0.060 U	0.081 U	0.071 U	0.050 U	0.042 U	0.038 U	0.047 U	0.060 U	0.035 U	0.045 U	0.064 U	0.045 U	0.055 U
Tetrachloroethene (PCE)	0.05	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
trans-1,2-Dichloroethene	1600	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
trans-1,3-Dichloropropene	--	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Trichloroethene (TCE)	0.03	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Trichlorofluoromethane	24000	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U
Vinyl Chloride	0.67	0.0013 U	--	--	0.0010 U	0.0012 U	0.0010 U	0.0012 U	0.0016 U	--	--	0.0011 U	0.0017 U	0.00094 U	--	0.00051 U	--	--	--	--	--	--	--	--	--	--	0.00047 U	0.00055 U

Notes

All results in milligrams per kilogram

Results in **bold** indicate concentrations of the analyte detected above the reporting limit (RL)

Blue shaded cells indicate concentrations of the analyte detected above the MTCA cleanup level

ND - individual compounds not detected above the laboratory RL so a total concentration is not calculated

[1]Depth of sample collected in feet below ground surface (bgs)

[2]Sample identifications that include an "A" indicate a field duplicate of the primary sample of the same name without an "A"

[3]Washington State Model Toxics Control Act (MTCA) Method A or B Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340)

[4]Total carcinogenic polycyclic aromatic hydrocarbon (cPAH) toxicity equivalent concentration (TEQ) calcualted per WAC 173-340-708(8) using 1/2 the RL for non-detect (ND) results.

U - Analyte not detected at or above the RL shown

"--" - indicates data not available

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B1	B1	B2	B2	B2	B2	B3	B3	B3	B3	B3	B4	B4	B5	B5
	Sample Date	11/09/2020	11/09/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/10/2020	11/10/2020
	Sample Identification	B1-7	B1-15	B2-7	B2-7A[2]	B2-15	B2-15A	B3-7	B3-7A	B3-10	B3-15	B3-15A	B4-7	B4-15	B5-7	B5-15
	Sample Depth (feet bgs)[1]	7	15	7	7	15	15	7	7	10	15	15	7	15	7	15
	Interpreted Lithology of Sampled Unit	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Fill	Fill	Fill	Qt	Qt	Qvr	Qvr	Qvr	Qvr
Analyte (by constituent group)	**MTCA Soil Cleanup Levels for Unrestricted Land Use[3]**															
Total Petroleum Hydrocarbons																
Gasoline-Range Organics	100	5.5 U	5.5 U	4.9 U	5.9 U	5.3 U	6.5 U	9.8 U	11 U	**21**	5.6 U	4.7 U	6.5 U	7.1 U	5.4 U	6.2 U
Diesel-Range Organics	2000	28 U	27 U	28 U	28 U	29 U	30 U	39 U	**120**	**700**	28 U	28 U	32 U	31 U	27 U	32 U
Motor Oil-Range Organics	2000	56 U	55 U	**170**	**97**	58 U	60 U	**530**	**960**	**4500**	56 U	57 U	65 U	63 U	54 U	63 U
TPH-D+O (ND = 1/2 RL)	2000	ND	ND	**184**	**111**	ND	ND	**549.5**	**1080**	**5200**	ND	ND	ND	ND	ND	ND
Benzene, Toluene, Ethylbenzene and Xylenes																
Benzene	0.03	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.022 U	0.040 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Toluene	7	0.055 U	0.055 U	0.049 U	0.059 U	0.053 U	0.065 U	0.098 U	0.11 U	0.20 U	0.056 U	0.047 U	0.065 U	0.071 U	0.054 U	0.062 U
Ethylbenzene	6	0.055 U	0.055 U	0.049 U	0.059 U	0.053 U	0.065 U	0.098 U	0.11 U	0.20 U	0.056 U	0.047 U	0.065 U	0.071 U	0.054 U	0.062 U
Total Xylenes	9	0.055 U	0.055 U	0.049 U	0.059 U	0.053 U	0.065 U	0.098 U	0.11 U	0.2 U	0.056 U	0.047 U	0.065 U	0.071 U	0.054 U	0.062 U
Metals																
Arsenic	20	--	--	11 U	11 U	12 U	12 U	15 U	15 U	25 U	11 U	11 U	13 U	13 U	11 U	13 U
Barium	16000	--	--	**56**	**65**	**31**	**36**	**96**	**61**	**140**	**20**	**27**	**33**	**36**	**53**	**26**
Cadmium	2	--	--	0.57 U	0.56 U	0.58 U	0.60 U	0.77 U	0.77 U	1.2 U	0.56 U	0.57 U	0.65 U	0.63 U	0.54 U	0.63 U
Chromium	--	--	--	**19**	**23**	**18**	**18**	**26**	**19**	**30**	**7.3**	**12**	**20**	**22**	**17**	**18**
Copper	3200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	250	--	--	5.7 U	**7**	5.8 U	6.0 U	**10**	**26**	**100**	5.6 U	5.7 U	6.5 U	6.3 U	5.4 U	6.3 U
Mercury	2	--	--	0.28 U	0.28 U	0.29 U	0.30 U	0.38 U	0.38 U	0.62 U	0.28 U	0.28 U	0.32 U	0.31 U	0.27 U	0.31 U
Selenium	400	--	--	11 U	11 U	12 U	12 U	15 U	15 U	25 U	11 U	11 U	13 U	13 U	11 U	13 U
Silver	400	--	--	1.1 U	1.1 U	1.2 U	1.2 U	1.5 U	1.5 U	2.5 U	1.1 U	1.1 U	1.3 U	1.3 U	1.1 U	1.3 U
Chromium (VI)	19	--	--	1.1 U	1.1 U	--	--	1.5 U	1.5 U	2.5 U	--	--	1.3 U	1.3 U	--	--
Semivolatile Organic Compounds																
Hexachlorobutadiene	13	--	--	0.0053 U	0.0054 U	--	--	0.0075 U	0.45 U	1.0 U	--	--	--	--	--	--
Pentachlorophenol	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAHs)																
1-Methylnaphthalene	34	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.019**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
2-Methylnaphthalene	320	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.030**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Acenaphthene	4800	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.021**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Acenaphthylene	--	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	0.016 U	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Anthracene	24000	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	0.016 U	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Benzo(g,h,i)perylene	--	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	0.016 U	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Fluoranthene	3200	--	--	**0.013**	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.053**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Fluorene	3200	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.021**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Naphthalene	5	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.083**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Phenanthrene	--	--	--	**0.013**	0.0074 U	0.0078 U	0.0080 U	0.010 U	**0.013**	**0.063**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Pyrene	2400	--	--	**0.016**	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.053**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U

Table 5. Subsurface Soil Data
Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B1	B1	B2	B2	B2	B2	B3	B3	B3	B3	B3	B4	B4	B5	B5
Sample Date		11/09/2020	11/09/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/10/2020	11/10/2020
Sample Identification		B1-7	B1-15	B2-7	B2-7A[2]	B2-15	B2-15A	B3-7	B3-7A	B3-10	B3-15	B3-15A	B4-7	B4-15	B5-7	B5-15
Sample Depth (feet bgs)[1]		7	15	7	7	15	15	7	7	10	15	15	7	15	7	15
Interpreted Lithology of Sampled Unit		Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Fill	Fill	Fill	Qt	Qt	Qvr	Qvr	Qvr	Qvr
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]															
Carcinogenic PAHs																
Benz(a)anthracene	--	--	--	**0.0077**	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	0.016 U	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Benzo(a)pyrene	0.1	--	--	**0.0086**	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	**0.018**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Benzo(b)fluoranthene	--	--	--	**0.011**	0.0074 U	0.0078 U	0.0080 U	**0.013**	0.010 U	**0.022**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Benzo(j,k)fluoranthene	--	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	0.016 U	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Chrysene	--	--	--	**0.0096**	0.0074 U	0.0078 U	0.0080 U	0.010 U	**0.011**	**0.027**	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Dibenzo(a,h)anthracene	--	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	0.016 U	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Indeno(1,2,3-cd)pyrene	--	--	--	0.0076 U	0.0074 U	0.0078 U	0.0080 U	0.010 U	0.010 U	0.016 U	0.0075 U	0.0076 U	0.0086 U	0.0083 U	0.0072 U	0.0084 U
Total cPAHs TEQ[4]	0.1	--	--	**0.012**	ND	ND	ND	**0.0084**	**0.0076**	**0.024**	ND	ND	ND	ND	ND	ND
Polychlorinated Biphenyls																
Aroclor 1016	5.6	--	--	0.057 U	0.056 U	--	--	0.077 U	0.077 U	0.12 U	--	--	--	--	--	--
Aroclor 1221	--	--	--	0.057 U	0.056 U	--	--	0.077 U	0.077 U	0.12 U	--	--	--	--	--	--
Aroclor 1232	--	--	--	0.057 U	0.056 U	--	--	0.077 U	0.077 U	0.12 U	--	--	--	--	--	--
Aroclor 1242	--	--	--	0.057 U	0.056 U	--	--	0.077 U	0.077 U	0.12 U	--	--	--	--	--	--
Aroclor 1248	--	--	--	0.057 U	0.056 U	--	--	0.077 U	0.077 U	0.12 U	--	--	--	--	--	--
Aroclor 1254	0.5	--	--	0.057 U	0.056 U	--	--	0.077 U	0.077 U	0.12 U	--	--	--	--	--	--
Aroclor 1260	0.5	--	--	0.057 U	0.056 U	--	--	0.077 U	0.077 U	0.12 U	--	--	--	--	--	--
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	38	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,1,1-Trichloroethane	2	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	5	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
1,1,2-Trichloroethane	18	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,1-Dichloroethane	180	--	--	0.0014 U	0.0014 U	--	--	0.0020 U	0.0017 U	0.0036 U	--	--	--	--	--	--
1,1-Dichloroethene	4000	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,1-Dichloropropene	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
1,2,3-Trichloropropane	0.0063	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
1,2,4-Trichlorobenzene	34	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	1.3	--	--	0.0053 U	0.0054 U	--	--	0.0075 U	0.45 U	1.0 U	--	--	--	--	--	--
1,2-Dibromoethane (EDB)	0.005	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,2-Dichlorobenzene	7200	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	11	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,2-Dichloropropane	27	--	--	0.0014 U	0.0014 U	--	--	0.0020 U	0.0017 U	0.0036 U	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
1,4-Dichlorobenzene	190	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
2-Chloroethyl Vinyl Ether	--	--	--	0.0053 U	0.0054 U	--	--	0.0075 U	0.0064 U	0.014 U	--	--	--	--	--	--
2-Chlorotoluene	1600	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B1	B1	B2	B2	B2	B2	B3	B3	B3	B3	B3	B4	B4	B5	B5
	Sample Date	11/09/2020	11/09/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/10/2020	11/10/2020
	Sample Identification	B1-7	B1-15	B2-7	B2-7A[2]	B2-15	B2-15A	B3-7	B3-7A	B3-10	B3-15	B3-15A	B4-7	B4-15	B5-7	B5-15
	Sample Depth (feet bgs)[1]	7	15	7	7	15	15	7	7	10	15	15	7	15	7	15
	Interpreted Lithology of Sampled Unit	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Fill	Fill	Fill	Qt	Qt	Qvr	Qvr	Qvr	Qvr
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]															
4-Chlorotoluene	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
Bromobenzene	640	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.091 U	0.20 U	--	--	--	--	--	--
Bromochloromethane	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Bromodichloromethane	16	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Bromoform	130	--	--	0.0053 U	0.0054 U	--	--	0.0075 U	0.0064 U	0.014 U	--	--	--	--	--	--
Bromomethane	110	--	--	0.0053 U	0.0054 U	--	--	0.0075 U	0.0064 U	0.014 U	--	--	--	--	--	--
Carbon Tetrachloride	14	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Chlorobenzene	1600	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Chloroethane	--	--	--	0.0053 U	0.0054 U	--	--	0.0075 U	0.0064 U	0.014 U	--	--	--	--	--	--
Chloroform	32	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Chloromethane	--	--	--	0.0079 U	0.0080 U	--	--	0.011 U	0.0096 U	0.021 U	--	--	--	--	--	--
cis-1,2-Dichloroethene (cDCE)	160	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
cis-1,3-Dichloropropene	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Dibromochloromethane	12	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Dibromomethane	800	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Dichlorodifluoromethane	16000	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
m,p-Xylenes	16000	0.055 U	0.055 U	0.049 U	0.059 U	0.053 U	0.065 U	0.098 U	0.11 U	0.20 U	0.056 U	0.047 U	0.065 U	0.071 U	0.054 U	0.062 U
Methyl tert-butyl ether (MTBE)	0.1	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Methylene Chloride	0.02	--	--	0.0068 U	0.0068 U	--	--	0.0096 U	0.0082 U	0.018 U	--	--	--	--	--	--
Methyliodide	--	--	--	0.0053 U	0.0054 U	--	--	0.0075 U	0.0064 U	0.014 U	--	--	--	--	--	--
o-Xylene	16000	0.055 U	0.055 U	0.049 U	0.059 U	0.053 U	0.065 U	0.098 U	0.11 U	0.20 U	0.056 U	0.047 U	0.065 U	0.071 U	0.054 U	0.062 U
Tetrachloroethene (PCE)	0.05	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
trans-1,2-Dichloroethene	1600	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
trans-1,3-Dichloropropene	--	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Trichloroethene (TCE)	0.03	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Trichlorofluoromethane	24000	--	--	0.0011 U	0.0011 U	--	--	0.0015 U	0.0013 U	0.0028 U	--	--	--	--	--	--
Vinyl Chloride	0.67	--	--	0.0015 U	0.0015 U	--	--	0.0021 U	0.0018 U	0.0039 U	--	--	--	--	--	--

Notes

All results in milligrams per kilogram

Results in **bold** indicate concentrations of the analyte detected above the reporting limit (RL)

Blue shaded cells indicate concentrations of the analyte detected above the MTCA cleanup level

Qt/Qvr - native glacial deposits consisting of either Quaternary glacial till (Qt) or Quaternary recessional outwash (Qvr)

unk - indicates information not available to determine lithologic unit

ND - individual compounds not detected above the laboratory RL so a total concentration is not calculated

[1]Depth of sample collected in feet below ground surface (bgs)

[2]Sample identifications that include an "A" indicate a field duplicate of the primary sample of the same name without an "A"

[3]Washington State Model Toxics Control Act (MTCA) Method A or B Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340)

[4]Total carcinogenic polycyclic aromatic hydrocarbon (cPAH) toxicity equivalent concentration (TEQ) calcualted per WAC 173-340-708(8) using 1/2 the RL for non-detect (ND) results.

U - Analyte not detected at or above the RL shown

"--" - indicates data not available

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B6	B6	B7	B7	B8	B8	B9	B9	B10	B10	B11	B11	B12	B13	B14
Sample Date		11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	06/24/2021	06/24/2021	06/24/2021
Sample Identification		B6-7	B6-15	B7-7	B7-15	B8-7	B8-15	B9-7	B9-15	B10-7	B10-15	B11-7	B11-15	B12-8	B13-8	B14-8
Sample Depth (feet bgs)[1]		7	15	7	15	7	15	7	15	7	15	7	15	8	8	8
Interpreted Lithology of Sampled Unit		Fill	Qvr	Fill	Qvr	Qvr	Qvr	Fill	Qvr	Qt	Qt	Qt	Qt	Qvr	Qvr	Qvr
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]															
Total Petroleum Hydrocarbons																
Gasoline-Range Organics	100	7.4 U	5.8 U	14 U	4.7 U	4.1 U	4.0 U	7.1 U	5.3 U	6.4 U	5.8 U	5.4 U	6.6 U	--	--	--
Diesel-Range Organics	2000	29 U	28 U	**140**	29 U	27 U	29 U	**280**	30 U	30 U	27 U	29 U	30 U	50 U	50 U	50 U
Motor Oil-Range Organics	2000	59 U	56 U	**1300**	59 U	53 U	58 U	**1200**	60 U	**75**	54 U	**67**	59 U	250 U	250 U	250 U
TPH-D+O (ND = 1/2 RL)	2000	ND	ND	**1440**	ND	ND	ND	**1480**	ND	**90**	ND	**81.5**	ND	ND	ND	ND
Benzene, Toluene, Ethylbenzene and Xylenes																
Benzene	0.03	0.020 U	0.020 U	0.029 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	--	--	--
Toluene	7	0.074 U	0.058 U	0.14 U	0.047 U	0.041 U	0.040 U	0.071 U	0.053 U	0.064 U	0.058 U	0.054 U	0.066 U	--	--	--
Ethylbenzene	6	0.074 U	0.058 U	0.14 U	0.047 U	0.041 U	0.040 U	0.071 U	0.053 U	0.064 U	0.058 U	0.054 U	0.066 U	--	--	--
Total Xylenes	9	0.074 U	0.058 U	0.14 U	0.047 U	0.041 U	0.04 U	0.071 U	0.053 U	0.064 U	0.058 U	0.054 U	0.066 U	--	--	--
Metals																
Arsenic	20	12 U	11 U	19 U	12 U	11 U	12 U	13 U	12 U	12 U	11 U	11 U	12 U	--	--	--
Barium	16000	**64**	**31**	**35**	**31**	**35**	**28**	**63**	**74**	**67**	**58**	**58**	**36**	--	--	--
Cadmium	2	0.59 U	0.56 U	0.95 U	0.59 U	0.53 U	0.58 U	0.64 U	0.60 U	0.61 U	0.54 U	0.57 U	0.59 U	--	--	--
Chromium	--	**26**	**14**	**19**	**19**	**14**	**13**	**16**	**24**	**19**	**14**	**23**	**22**	--	--	--
Copper	3200	--	--	--	--	--	--	--	--	--	--	**19**	**9.2**	--	--	--
Lead	250	**5.9**	5.6 U	**16**	5.9 U	5.3 U	5.8 U	**6.5**	6.0 U	6.1 U	5.4 U	5.7 U	5.9 U	--	--	--
Mercury	2	0.29 U	0.28 U	**1.3**	0.29 U	0.27 U	0.29 U	0.32 U	0.30 U	0.30 U	0.27 U	0.29 U	0.30 U	--	--	--
Selenium	400	12 U	11 U	19 U	12 U	11 U	12 U	13 U	12 U	12 U	11 U	11 U	12 U	--	--	--
Silver	400	1.2 U	1.1 U	1.9 U	1.2 U	1.1 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	1.1 U	1.2 U	--	--	--
Chromium (VI)	19	1.2 U	--	1.9 U	1.2 U	--	--	--	1.2 U	1.2 U	--	1.1 U	1.2 U	--	--	--
Semivolatile Organic Compounds																
Hexachlorobutadiene	13	--	--	0.65 U	--	--	--	0.35 U	--	0.0058 U	--	0.0045 U	--	--	--	--
Pentachlorophenol	2.5	--	--	--	--	--	--	--	--	--	--	0.19 U	0.20 U	--	--	--
Polycyclic Aromatic Hydrocarbons (PAHs)																
1-Methylnaphthalene	34	0.0078 U	0.0075 U	**0.018**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
2-Methylnaphthalene	320	0.0078 U	0.0075 U	**0.034**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Acenaphthene	4800	0.0078 U	0.0075 U	**0.067**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Acenaphthylene	--	0.0078 U	0.0075 U	**0.013**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Anthracene	24000	0.0078 U	0.0075 U	**0.11**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Benzo(g,h,i)perylene	--	**0.012**	0.0075 U	**0.019**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Fluoranthene	3200	**0.039**	0.0075 U	**0.35**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Fluorene	3200	0.0078 U	0.0075 U	**0.10**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Naphthalene	5	0.0078 U	0.0075 U	**0.059**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Phenanthrene	--	**0.027**	0.0075 U	**0.18**	0.0078 U	0.0071 U	0.0077 U	**0.014**	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Pyrene	2400	**0.037**	0.0075 U	**0.35**	0.0078 U	0.0071 U	0.0077 U	**0.034**	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B6	B6	B7	B7	B8	B8	B9	B9	B10	B10	B11	B11	B12	B13	B14
Sample Date		11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	06/24/2021	06/24/2021	06/24/2021
Sample Identification		B6-7	B6-15	B7-7	B7-15	B8-7	B8-15	B9-7	B9-15	B10-7	B10-15	B11-7	B11-15	B12-8	B13-8	B14-8
Sample Depth (feet bgs)[1]		7	15	7	15	7	15	7	15	7	15	7	15	8	8	8
Interpreted Lithology of Sampled Unit		Fill	Qvr	Fill	Qvr	Qvr	Qvr	Fill	Qvr	Qt	Qt	Qt	Qt	Qvr	Qvr	Qvr
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]															
Carcinogenic PAHs																
Benz(a)anthracene	--	**0.015**	0.0075 U	**0.067**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Benzo(a)pyrene	0.1	**0.017**	0.0075 U	**0.041**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Benzo(b)fluoranthene	--	**0.022**	0.0075 U	**0.077**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Benzo(j,k)fluoranthene	--	**0.009**	0.0075 U	**0.02**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Chrysene	--	**0.021**	0.0075 U	**0.083**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Dibenzo(a,h)anthracene	--	0.0078 U	0.0075 U	0.013 U	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Indeno(1,2,3-cd)pyrene	--	**0.012**	0.0075 U	**0.02**	0.0078 U	0.0071 U	0.0077 U	0.0085 U	0.0080 U	0.0081 U	0.0072 U	0.0076 U	0.0079 U	--	--	--
Total cPAHs TEQ[4]	0.1	**0.023**	ND	**0.061**	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
Polychlorinated Biphenyls																
Aroclor 1016	5.6	--	--	0.095 U	--	--	--	0.064 U	--	0.061 U	--	0.057 U	--	--	--	--
Aroclor 1221	--	--	--	0.095 U	--	--	--	0.064 U	--	0.061 U	--	0.057 U	--	--	--	--
Aroclor 1232	--	--	--	0.095 U	--	--	--	0.064 U	--	0.061 U	--	0.057 U	--	--	--	--
Aroclor 1242	--	--	--	0.095 U	--	--	--	0.064 U	--	0.061 U	--	0.057 U	--	--	--	--
Aroclor 1248	--	--	--	0.095 U	--	--	--	0.064 U	--	0.061 U	--	0.057 U	--	--	--	--
Aroclor 1254	0.5	--	--	0.095 U	--	--	--	0.064 U	--	0.061 U	--	0.057 U	--	--	--	--
Aroclor 1260	0.5	--	--	0.095 U	--	--	--	0.064 U	--	0.061 U	--	0.057 U	--	--	--	--
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	38	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,1,1-Trichloroethane	2	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,1,2,2-Tetrachloroethane	5	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,1,2-Trichloroethane	18	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,1-Dichloroethane	180	--	--	0.0025 U	--	--	--	0.0017 U	--	0.0015 U	--	0.0012 U	--	--	--	--
1,1-Dichloroethene	4000	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,1-Dichloropropene	--	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,2,3-Trichlorobenzene	--	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,2,3-Trichloropropane	0.0063	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,2,4-Trichlorobenzene	34	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,2-Dibromo-3-chloropropane	1.3	--	--	0.65 U	--	--	--	0.35 U	--	0.0058 U	--	0.0045 U	--	--	--	--
1,2-Dibromoethane (EDB)	0.005	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,2-Dichlorobenzene	7200	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,2-Dichloroethane (EDC)	11	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,2-Dichloropropane	27	--	--	0.0025 U	--	--	--	0.0017 U	--	0.0015 U	--	0.0012 U	--	--	--	--
1,3-Dichlorobenzene	--	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,3-Dichloropropane	--	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
1,4-Dichlorobenzene	190	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
2,2-Dichloropropane	--	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
2-Chloroethyl Vinyl Ether	--	--	--	0.0095 U	--	--	--	0.0067 U	--	0.0058 U	--	0.0045 U	--	--	--	--
2-Chlorotoluene	1600	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B6	B6	B7	B7	B8	B8	B9	B9	B10	B10	B11	B11	B12	B13	B14
	Sample Date	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	06/24/2021	06/24/2021	06/24/2021
	Sample Identification	B6-7	B6-15	B7-7	B7-15	B8-7	B8-15	B9-7	B9-15	B10-7	B10-15	B11-7	B11-15	B12-8	B13-8	B14-8
	Sample Depth (feet bgs)[1]	7	15	7	15	7	15	7	15	7	15	7	15	8	8	8
	Interpreted Lithology of Sampled Unit	Fill	Qvr	Fill	Qvr	Qvr	Qvr	Fill	Qvr	Qt	Qt	Qt	Qt	Qvr	Qvr	Qvr
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]															
4-Chlorotoluene	--	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Bromobenzene	640	--	--	0.13 U	--	--	--	0.070 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Bromochloromethane	--	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Bromodichloromethane	16	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Bromoform	130	--	--	0.0095 U	--	--	--	0.0067 U	--	0.0058 U	--	0.0045 U	--	--	--	--
Bromomethane	110	--	--	0.0095 U	--	--	--	0.0067 U	--	0.0058 U	--	0.0045 U	--	--	--	--
Carbon Tetrachloride	14	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Chlorobenzene	1600	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Chloroethane	--	--	--	0.0095 U	--	--	--	0.0067 U	--	0.0058 U	--	0.0045 U	--	--	--	--
Chloroform	32	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Chloromethane	--	--	--	0.014 U	--	--	--	0.010 U	--	0.0086 U	--	0.0068 U	--	--	--	--
cis-1,2-Dichloroethene (cDCE)	160	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
cis-1,3-Dichloropropene	--	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Dibromochloromethane	12	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Dibromomethane	800	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Dichlorodifluoromethane	16000	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
m,p-Xylenes	16000	0.074 U	0.058 U	0.14 U	0.047 U	0.041 U	0.040 U	0.071 U	0.053 U	0.064 U	0.058 U	0.054 U	0.066 U	--	--	--
Methyl tert-butyl ether (MTBE)	0.1	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Methylene Chloride	0.02	--	--	0.012 U	--	--	--	0.0085 U	--	0.0074 U	--	0.0058 U	--	--	--	--
Methyliodide	--	--	--	0.0095 U	--	--	--	0.0067 U	--	0.0058 U	--	0.0045 U	--	--	--	--
o-Xylene	16000	0.074 U	0.058 U	0.14 U	0.047 U	0.041 U	0.040 U	0.071 U	0.053 U	0.064 U	0.058 U	0.054 U	0.066 U	--	--	--
Tetrachloroethene (PCE)	0.05	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
trans-1,2-Dichloroethene	1600	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
trans-1,3-Dichloropropene	--	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Trichloroethene (TCE)	0.03	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Trichlorofluoromethane	24000	--	--	0.0019 U	--	--	--	0.0013 U	--	0.0012 U	--	0.00091 U	--	--	--	--
Vinyl Chloride	0.67	--	--	0.0027 U	--	--	--	0.0019 U	--	0.0016 U	--	0.0013 U	--	--	--	--

Notes

All results in milligrams per kilogram

Results in **bold** indicate concentrations of the analyte detected above the reporting limit (RL)

Blue shaded cells indicate concentrations of the analyte detected above the MTCA cleanup level

Qt/Qvr - native glacial deposits consisting of either Quaternary glacial till (Qt) or Quaternary recessional outwash (Qvr)

unk - indicates information not available to determine lithologic unit

ND - individual compounds not detected above the laboratory RL so a total concentration is not calculated

[1]Depth of sample collected in feet below ground surface (bgs)

[2]Sample identifications that include an "A" indicate a field duplicate of the primary sample of the same name without an "A"

[3]Washington State Model Toxics Control Act (MTCA) Method A or B Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340)

[4]Total carcinogenic polycyclic aromatic hydrocarbon (cPAH) toxicity equivalent concentration (TEQ) calcualted per WAC 173-340-708(8) using 1/2 the RL for non-detect (ND) results.

U - Analyte not detected at or above the RL shown

"--" - indicates data not available

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B15	B16	B17	B18	B18	B19	B19	B20	B20	B21	B21
Sample Date		06/24/2021	06/24/2021	06/24/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021
Sample Identification		B15-9	B16-8	B17-8	B18-8	B18-18	B19-10	B19-17	B20-10	B20-15	B21-5	B21-10
Sample Depth (feet bgs)[1]		9	8	8	8	18	10	17	10	15	5	10
Interpreted Lithology of Sampled Unit		Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Fill	Qvr
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]											
Total Petroleum Hydrocarbons												
Gasoline-Range Organics	100	--	--	--	--	--	--	--	--	--	--	--
Diesel-Range Organics	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Motor Oil-Range Organics	2000	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
TPH-D+O (ND = 1/2 RL)	2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene, Toluene, Ethylbenzene and Xylenes												
Benzene	0.03	--	--	--	--	--	--	--	--	--	--	--
Toluene	7	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	6	--	--	--	--	--	--	--	--	--	--	--
Total Xylenes	9	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic	20	--	--	--	--	--	--	--	--	--	--	--
Barium	16000	--	--	--	--	--	--	--	--	--	--	--
Cadmium	2	--	--	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--	--	--	--
Copper	3200	--	--	--	--	--	--	--	--	--	--	--
Lead	250	--	--	--	--	--	--	--	--	--	--	--
Mercury	2	--	--	--	--	--	--	--	--	--	--	--
Selenium	400	--	--	--	--	--	--	--	--	--	--	--
Silver	400	--	--	--	--	--	--	--	--	--	--	--
Chromium (VI)	19	--	--	--	--	--	--	--	--	--	--	--
Semivolatile Organic Compounds												
Hexachlorobutadiene	13	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	2.5	--	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAHs)												
1-Methylnaphthalene	34	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	320	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	4800	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	24000	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	3200	--	--	--	--	--	--	--	--	--	--	--
Fluorene	3200	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	5	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	2400	--	--	--	--	--	--	--	--	--	--	--

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B15	B16	B17	B18	B18	B19	B19	B20	B20	B21	B21
Sample Date		06/24/2021	06/24/2021	06/24/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021
Sample Identification		B15-9	B16-8	B17-8	B18-8	B18-18	B19-10	B19-17	B20-10	B20-15	B21-5	B21-10
Sample Depth (feet bgs)[1]		9	8	8	8	18	10	17	10	15	5	10
Interpreted Lithology of Sampled Unit		Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Fill	Qvr
Analyte (by constituent group)	**MTCA Soil Cleanup Levels for Unrestricted Land Use[3]**											
Carcinogenic PAHs												
Benz(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	0.1	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(j,k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--	--	--	--
Total cPAHs TEQ[4]	0.1	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls												
Aroclor 1016	5.6	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1221	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1232	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1242	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1248	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1254	0.5	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1260	0.5	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds												
1,1,1,2-Tetrachloroethane	38	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	2	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	5	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	18	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	180	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	4000	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	0.0063	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	34	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	1.3	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (EDB)	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	7200	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	11	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	27	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	190	--	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
2-Chloroethyl Vinyl Ether	--	--	--	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	1600	--	--	--	--	--	--	--	--	--	--	--

Table 5. Subsurface Soil Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B15	B16	B17	B18	B18	B19	B19	B20	B20	B21	B21
Sample Date		06/24/2021	06/24/2021	06/24/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021	06/25/2021
Sample Identification		B15-9	B16-8	B17-8	B18-8	B18-18	B19-10	B19-17	B20-10	B20-15	B21-5	B21-10
Sample Depth (feet bgs)[1]		9	8	8	8	18	10	17	10	15	5	10
Interpreted Lithology of Sampled Unit		Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Qvr	Fill	Qvr
Analyte (by constituent group)	MTCA Soil Cleanup Levels for Unrestricted Land Use[3]											
4-Chlorotoluene	--	--	--	--	--	--	--	--	--	--	--	--
Bromobenzene	640	--	--	--	--	--	--	--	--	--	--	--
Bromochloromethane	--	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	16	--	--	--	--	--	--	--	--	--	--	--
Bromoform	130	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	110	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	14	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	1600	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	--	--	--	--	--	--	--	--	--	--	--	--
Chloroform	32	--	--	--	--	--	--	--	--	--	--	--
Chloromethane	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene (cDCE)	160	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	12	--	--	--	--	--	--	--	--	--	--	--
Dibromomethane	800	--	--	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	16000	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	16000	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	0.1	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	0.02	--	--	--	--	--	--	--	--	--	--	--
Methyliodide	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	16000	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	0.05	--	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	1600	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene (TCE)	0.03	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	24000	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	0.67	--	--	--	--	--	--	--	--	--	--	--

Notes

All results in milligrams per kilogram

Results in **bold** indicate concentrations of the analyte detected above the reporting limit (RL)

Blue shaded cells indicate concentrations of the analyte detected above the MTCA cleanup level

Qt/Qvr - native glacial deposits consisting of either Quaternary glacial till (Qt) or Quaternary recessional outwash (Qvr)

unk - indicates information not available to determine lithologic unit

ND - individual compounds not detected above the laboratory RL so a total concentration is not calculated

[1]Depth of sample collected in feet below ground surface (bgs)

[2]Sample identifications that include an "A" indicate a field duplicate of the primary sample of the same name without an "A"

[3]Washington State Model Toxics Control Act (MTCA) Method A or B Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340)

[4]Total carcinogenic polycyclic aromatic hydrocarbon (cPAH) toxicity equivalent concentration (TEQ) calcualted per WAC 173-340-708(8) using 1/2 the RL for non-detect (ND) results.

U - Analyte not detected at or above the RL shown

"--" - indicates data not available

Table 6. Reconnaissance Groundwater Data

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B12	B13	B14	B15	B16	B17	B19	B21
	Sample Date	06/24/2021	06/24/2021	06/24/2021	06/24/2021	06/24/2021	06/24/2021	06/24/2021	06/24/2021
	Sample Identification	B12-W	B13-W	B14-W	B15-W	B16-W	B17-W	B19-W	B21-W
Analyte (by constituent group)	**MTCA Cleanup Levels for Ground Water[1]**								
Total Petroleum Hydrocarbons									
Gasoline-Range Organics	800	--	--	--	--	--	--	--	--
Diesel-Range Organics	500	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
Motor Oil-Range Organics	500	400 U	400 U	400 U	400 U	400 U	400 U	400 U	400 U
TPH-D+O (ND = 1/2 RL)	500	ND	ND	ND	ND	ND	ND	ND	ND
Metals									
Arsenic, dissolved	8	**9.99**	1 U	1 U	**6.24**	**2.66**	1 U	--	--
Arsenic, total	8	**48.2**	**4.04**	**10.6**	**7.32**	**11.9**	**15.9**	**1.71**	**26.5**
Iron, dissolved	11000	**109**	100 U	100 U	**409**	100 U	**102**	--	--
Iron, total	11000	**321000**	**14900**	**61100**	**3680**	**41400**	**73100**	--	--
Manganese, dissolved	750	**7430**	**199**	**1790**	**9200**	**2600**	**75.6**	--	--
Manganese, total	750	**36100**	**491**	**12600**	**9150**	**4460**	**5930**	**6690**	**5390**

Notes

All results in micrograms per liter.

Results in **bold** indicate concentrations of the analyte detected above the reporting limit (RL).

Blue shaded cells indicate concentrations of the analyte detected above the MTCA cleanup level.

ND - individual compounds not detected above the laboratory reporting limit (RL) so a total concentration is not calculated.

[1]Washington State Model Toxics Control Act (MTCA) Method A or B Cleanup Levels forGroundwater (WAC 173-340)

U - Analyte not detected at or above the RL shown.

"--" - indicates data not available

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B1/MW1		B2/MW2		B3/MW3		B4/MW4		B5/MW5		B6/MW6	
	Sample Date	11/12/2020	05/06/2021	11/13/2020	05/06/2021	11/14/2020	05/06/2021	11/13/2020	05/06/2021	11/12/2020	05/06/2021	11/12/2020	05/06/2021
	Sample Identification	MW1-111220	MW1-050621	MW2-111320	MW2-050621	MW3-111420	MW3-050621	MW4-111320	MW4-050621	MW5-111220	MW5-050621	MW6-111220	MW6-050621
Analyte (by constituent group)	**MTCA Cleanup Levels for Ground Water[1]**												
Conventionals													
Ammonia as Nitrogen	--	50 U	**56**	**130**	**3600**	**960**	**1300**	50 U	**1100**	**810**	**1600**	**1200**	50 U
Field Parameters													
pH (pH units)	--	--	5.55	--	7.03	--	5.31	--	7.07	--	7.08	--	6.79
Conductivity (microsiemens/centimeter)	--	--	133	--	1180	--	109	--	1341	--	522	--	356
Dissovled Oxygen (milligrams/liter)	--	--	0.07	--	0.21	--	0.10	--	0.17	--	0.14	--	0.64
Oxidation Reduction Potential (milliVolts)	--	--	-77.7	--	-87.8	--	-15.9	--	-89.6	--	-59.6	--	-59.8
Total Petroleum Hydrocarbons													
Gasoline-Range Organics	800	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Diesel-Range Organics	500	220 U	210 U	210 U	**570**	210 U	210 U	220 U	**520**	210 U	210 U	210 U	210 U
Motor Oil-Range Organics	500	220 U	210 U	**540**	**1600**	**260**	**530**	**310**	**1600**	**270**	**510**	**230**	**490**
TPH D+O (ND=1/2 RL)	500	ND	ND	**645**	**2170**	**365**	**635**	**420**	**2120**	**375**	**615**	**335**	**595**
Benzene, Toluene, Ethylbenzene, and Xylenes													
Benzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Total Xylenes	1000	1 U	1.0 U	1 U	1.0 U	1 U	1.0 U	1 U	1.0 U	1 U	1.0 U	1 U	1.0 U
Metals													
Arsenic, dissolved	8	3.0 U	3.0 U	**7.4**	**12**	3.0 U	3.0 U	3.0 U	**11**	**42**	**11**	**15**	3.0 U
Arsenic, total	8	3.3 U	3.3 U	**8.2**	**10**	3.3 U	3.3 U	3.3 U	**11**	**73**	**13**	**18**	3.3 U
Barium, dissolved	3200	25 U	25 U	**38**	25 U	25 U	25 U	**52**	**59**	**26**	**170**	25 U	25 U
Barium, total	3200	**30**	28 U	**55**	28 U	28 U	28 U	**90**	**68**	**50**	**200**	**33**	28 U
Cadmium, dissolved	5	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	5.0 U
Cadmium, total	5	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
Chromium, dissolved	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chromium, total	50	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Copper, dissolved	640	--	10 U	--	10 U	--	10 U	--	10 U	--	10 U	--	10 U
Copper, total	640	--	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	11 U
Iron, dissolved	11000	56 U	--	**2100**	--	**9400**	--	**260**	--	**42000**	--	**16000**	--
Iron, total	11000	**2700**	**270**	**4600**	**48000**	**13000**	**15000**	**7300**	**19000**	**58000**	**41000**	**18000**	**770**
Lead, dissolved	15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Lead, total	15	1.1 U	1.1 U	1.1 U	1.1 U	**1.2**	1.1 U	**5.9**	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Manganese, dissolved	750	**560**	--	**18000**	--	**1000**	--	**6200**	--	**13000**	--	**4500**	--
Manganese, total	750	**630**	**130**	**17000**	**15000**	**1000**	**1000**	**6200**	**28000**	**11000**	**1900**	**4500**	**320**
Mercury, dissolved	2	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U
Mercury, total	2	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U
Selenium, dissolved	80	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Selenium, total	80	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
Silver, dissolved	80	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Silver, total	80	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B1/MW1		B2/MW2		B3/MW3		B4/MW4		B5/MW5		B6/MW6	
	Sample Date	11/12/2020	05/06/2021	11/13/2020	05/06/2021	11/14/2020	05/06/2021	11/13/2020	05/06/2021	11/12/2020	05/06/2021	11/12/2020	05/06/2021
	Sample Identification	MW1-111220	MW1-050621	MW2-111320	MW2-050621	MW3-111420	MW3-050621	MW4-111320	MW4-050621	MW5-111220	MW5-050621	MW6-111220	MW6-050621
Analyte (by constituent group)	**MTCA Cleanup Levels for Ground Water[1]**												
Other SVOCs													
Benzoic acid	64000	26 U	--	27 U	--	26 U	--	27 U	--	27 U	--	26 U	--
Hexachlorobutadiene	0.56	--	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Pentachlorophenol	0.22	--	--	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrcarbons (PAHs)													
1-Methylnaphthalene	1.5	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
2-Methylnaphthalene	32	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Acenaphthene	960	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Acenaphthylene	--	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Anthracene	4800	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Benzo(g,h,i)perylene	--	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	0.010 U	--	0.0097 U	--
Fluoranthene	640	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Fluorene	640	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Naphthalene	160	--	--	0.099 U	--	**0.12**	--	0.10 U	--	0.10 U	--	0.097 U	--
Phenanthrene	--	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Pyrene	480	--	--	0.099 U	--	0.097 U	--	0.10 U	--	0.10 U	--	0.097 U	--
Carcinogenic PAHs													
Benz(a)anthracene	--	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	0.010 U	--	0.0097 U	--
Benzo(a)pyrene	0.1	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	0.010 U	--	0.0097 U	--
Benzo(b)fluoranthene	--	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	0.010 U	--	0.0097 U	--
Benzo(j,k)fluoranthene	--	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	--	--	0.0097 U	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	0.010 U	--	--	--
Chrysene	--	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	0.010 U	--	0.0097 U	--
Dibenzo(a,h)anthracene	--	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	0.010 U	--	0.0097 U	--
Indeno(1,2,3-cd)pyrene	--	--	--	0.0099 U	--	0.0097 U	--	0.010 U	--	0.010 U	--	0.0097 U	--
Total cPAHs TEQ[2]	0.1	--	--	ND	--	ND	--	ND	--	ND	--	ND	--
PCBAro													
Aroclor 1016	0.56	--	--	0.050 U	--	0.049 U	--	0.050 U	--	0.050 U	--	0.048 U	--
Aroclor 1221	--	--	--	0.050 U	--	0.049 U	--	0.050 U	--	0.050 U	--	0.048 U	--
Aroclor 1232	--	--	--	0.050 U	--	0.049 U	--	0.050 U	--	0.050 U	--	0.048 U	--
Aroclor 1242	--	--	--	0.050 U	--	0.049 U	--	0.050 U	--	0.050 U	--	0.048 U	--
Aroclor 1248	--	--	--	0.050 U	--	0.049 U	--	0.050 U	--	0.050 U	--	0.048 U	--
Aroclor 1254	0.022	--	--	0.050 U	--	0.049 U	--	0.050 U	--	0.050 U	--	0.048 U	--
Aroclor 1260	0.022	--	--	0.050 U	--	0.049 U	--	0.050 U	--	0.050 U	--	0.048 U	--
Total PCBs (Sum of Aroclors)	0.1	--	0.49 U	--	0.49 U	--	0.48 U	--	0.51 U	--	0.5 U	--	0.49 U
VOCs													
1,1,1,2-Tetrachloroethane	1.7	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,1,1-Trichloroethane	200	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B1/MW1		B2/MW2		B3/MW3		B4/MW4		B5/MW5		B6/MW6	
	Sample Date	11/12/2020	05/06/2021	11/13/2020	05/06/2021	11/14/2020	05/06/2021	11/13/2020	05/06/2021	11/12/2020	05/06/2021	11/12/2020	05/06/2021
	Sample Identification	MW1-111220	MW1-050621	MW2-111320	MW2-050621	MW3-111420	MW3-050621	MW4-111320	MW4-050621	MW5-111220	MW5-050621	MW6-111220	MW6-050621
Analyte (by constituent group)	MTCA Cleanup Levels for Ground Water[1]												
1,1,2,2-Tetrachloroethane	0.22	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,1,2-Trichloroethane	0.77	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,1-Dichloroethane	7.7	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,1-Dichloroethene	400	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,1-Dichloropropene	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,2,3-Trichlorobenzene	--	--	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
1,2,3-Trichloropropane	0.00038	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,2,4-Trichlorobenzene	1.5	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,2-Dibromo-3-chloropropane	0.055	--	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
1,2-Dibromoethane (EDB)	0.01	--	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U
1,2-Dichlorobenzene	720	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,2-Dichloroethane (EDC)	5	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,2-Dichloropropane	1.2	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,3-Dichlorobenzene	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,3-Dichloropropane	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
1,4-Dichlorobenzene	8.1	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
2,2-Dichloropropane	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
2-Chloroethyl Vinyl Ether	--	--	--	30 U	--	30 U	--	30 U	--	30 U	--	30 U	--
2-Chlorotoluene	160	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
4-Chlorotoluene	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Bromobenzene	64	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Bromochloromethane	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Bromodichloromethane	0.71	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Bromoform	5.5	--	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Bromomethane	11	--	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--
Carbon Tetrachloride	0.63	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Chlorobenzene	160	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Chloroethane	--	--	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Chloroform	1.4	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Chloromethane	--	--	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
cis-1,2-Dichloroethene (DCE)	16	--	0.2 U	0.20 U	0.2 U	0.20 U	--	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U
cis-1,3-Dichloropropene	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Dibromochloromethane	0.52	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Dibromomethane	80	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Dichlorodifluoromethane	1600	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
m,p-Xylenes	1600	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Methyl tert-butyl ether (MTBE)	20	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Methylene Chloride	5	--	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Methyliodide	--	--	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B1/MW1		B2/MW2		B3/MW3		B4/MW4		B5/MW5		B6/MW6	
Sample Date		11/12/2020	05/06/2021	11/13/2020	05/06/2021	11/14/2020	05/06/2021	11/13/2020	05/06/2021	11/12/2020	05/06/2021	11/12/2020	05/06/2021
Sample Identification		MW1-111220	MW1-050621	MW2-111320	MW2-050621	MW3-111420	MW3-050621	MW4-111320	MW4-050621	MW5-111220	MW5-050621	MW6-111220	MW6-050621
Analyte (by constituent group)	**MTCA Cleanup Levels for Ground Water[1]**												
o-Xylene	1600	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Tetrachloroethene (PCE)	5	--	0.2 U	0.20 U	0.2 U	0.20 U	--	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U
trans-1,2-Dichloroethene	160	--	0.2 U	0.20 U	0.2 U	0.20 U	--	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U
trans-1,3-Dichloropropene	--	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Trichloroethene (TCE)	5	--	0.2 U	0.20 U	0.2 U	0.20 U	--	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U
Trichlorofluoromethane	2400	--	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Vinyl Chloride	0.2	--	0.2 U	0.20 U	0.2 U	0.20 U	--	0.20 U	0.2 U	0.20 U	0.2 U	0.20 U	0.2 U

Notes:

All results in micrograms per liter, unless indicated otherwise.

Results in **bold** indicate concentrations of the analyte detected above the reporting limit (RL).

Results in *italics* indicate data that may not be representative of groundwater quality.

Blue shaded cells indicate concentrations of the analyte detected above the MTCA cleanup level.

ND - individual compounds not detected above the laboratory RL so a total concentration is not calculated.

[1]Washington State Model Toxics Control Act (MTCA) Method A or B Cleanup Levels for Groundwater (WAC 173-340)

[2]Total carcinogenic polycyclic aromatic hydrocarbon (cPAH) toxicity equivalent concentration (TEQ) calcualted per WAC 173-340-708(8) using 1/2 the RL for non-detect (ND) results.

U - Analyte not detected at or above the RL shown.

"--" - indicates data not available

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B7/MW7		B8/MW8		B9/MW9	B11/MW11	
	Sample Date	11/12/2020	05/06/2021	11/14/2020	05/06/2021	05/06/2021	11/14/2020	05/06/2021
	Sample Identification	MW7-111220	MW7-050621	MW8-111420	MW8-050621	MW9-050621	MW11-111420	MW11-050621
Analyte (by constituent group)	MTCA Cleanup Levels for Ground Water[1]							
Conventionals								
Ammonia as Nitrogen	--	**3800**	**3500**	**560**	50 U	***3500***	50 U	50 U
Field Parameters								
pH (pH units)	--	**--**	6.77	**--**	6.40	*5.25*	**--**	5.13
Conductivity (microsiemens/centimeter)	--	**--**	638	**--**	113	*324*	**--**	55.3
Dissovled Oxygen (milligrams/liter)	--	**--**	0.39	**--**	0.13	*0.25*	**--**	7.02
Oxidation Reduction Potential (milliVolts)	--	**--**	-36.1	**--**	-72.1	*-52.1*	**--**	155.2
Total Petroleum Hydrocarbons								
Gasoline-Range Organics	800	100 U	100 U	100 U	100 U	*100 U*	100 U	100 U
Diesel-Range Organics	500	**380**	**260**	210 U	200 U	***390***	210 U	210 U
Motor Oil-Range Organics	500	**630**	**240**	210 U	200 U	***440***	210 U	210 U
TPH D+O (ND=1/2 RL)	500	**1010**	**500**	ND	ND	***830***	ND	ND
Benzene, Toluene, Ethylbenzene, and Xylenes								
Benzene	5	1.0 U	1.0 U	1.0 U	1.0 U	*1.0 U*	1.0 U	1.0 U
Toluene	1000	1.0 U	1.0 U	1.0 U	1.0 U	*1.0 U*	1.0 U	1.0 U
Ethylbenzene	700	1.0 U	1.0 U	1.0 U	1.0 U	*1.0 U*	1.0 U	1.0 U
Total Xylenes	1000	1 U	1.0 U	1 U	1.0 U	*1.0 U*	1 U	1.0 U
Metals								
Arsenic, dissolved	8	**21**	**5.1**	3.0 U	3.0 U	***3.8***	3.0 U	3.0 U
Arsenic, total	8	**36**	**5.2**	3.3 U	3.3 U	***4.1***	3.3 U	3.3 U
Barium, dissolved	3200	**40**	25 U	25 U	25 U	***41***	25 U	25 U
Barium, total	3200	**62**	28 U	**37**	28 U	***55***	**32**	28 U
Cadmium, dissolved	5	4.0 U	4.0 U	4.0 U	4.0 U	*4.0 U*	4.0 U	4.0 U
Cadmium, total	5	4.4 U	4.4 U	4.4 U	4.4 U	*4.4 U*	4.4 U	4.4 U
Chromium, dissolved	50	10 U	10 U	10 U	10 U	*10 U*	10 U	10 U
Chromium, total	50	11 U	11 U	11 U	11 U	*11 U*	11 U	11 U
Copper, dissolved	640	--	10 U	--	10 U	*10 U*	10 U	10 U
Copper, total	640	--	11 U	--	11 U	*11 U*	11 U	11 U
Iron, dissolved	11000	**37000**	--	**560**	--	--	**95**	--
Iron, total	11000	**47000**	**53000**	**8600**	**5200**	***88000***	**3900**	**130**
Lead, dissolved	15	1.0 U	1.0 U	1.0 U	1.0 U	*1.0 U*	1.0 U	1.0 U
Lead, total	15	1.1 U	1.1 U	1.1 U	1.1 U	*1.1 U*	1.1 U	1.1 U
Manganese, dissolved	750	**7600**	--	**2500**	--	--	11 U	--
Manganese, total	750	**7100**	**4200**	**2500**	**660**	***7300***	**110**	10 U
Mercury, dissolved	2	0.50 U	0.5 U	0.50 U	0.5 U	*0.5 U*	0.50 U	0.5 U
Mercury, total	2	0.50 U	0.5 U	0.50 U	0.5 U	*0.5 U*	0.50 U	0.5 U
Selenium, dissolved	80	5.0 U	5.0 U	5.0 U	5.0 U	*5.0 U*	5.0 U	5.0 U
Selenium, total	80	5.6 U	5.6 U	5.6 U	5.6 U	*5.6 U*	5.6 U	5.6 U
Silver, dissolved	80	10 U	10 U	10 U	10 U	*10 U*	10 U	10 U
Silver, total	80	11 U	11 U	11 U	11 U	*11 U*	11 U	11 U

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B7/MW7		B8/MW8		B9/MW9	B11/MW11	
	Sample Date	11/12/2020	05/06/2021	11/14/2020	05/06/2021	05/06/2021	11/14/2020	05/06/2021
	Sample Identification	MW7-111220	MW7-050621	MW8-111420	MW8-050621	MW9-050621	MW11-111420	MW11-050621
Analyte (by constituent group)	**MTCA Cleanup Levels for Ground Water[1]**							
Other SVOCs								
Benzoic acid	64000	26 U	--	27 U	--	--	27 U	--
Hexachlorobutadiene	0.56	1.0 U	--	--	--	--	--	--
Pentachlorophenol	0.22	--	--	--	--	--	5.0 U	--
Polycyclic Aromatic Hydrcarbons (PAHs)								
1-Methylnaphthalene	1.5	0.098 U	--	0.10 U	--	--	0.10 U	--
2-Methylnaphthalene	32	0.098 U	--	0.10 U	--	--	0.10 U	--
Acenaphthene	960	**0.11**	--	0.10 U	--	--	0.10 U	--
Acenaphthylene	--	0.098 U	--	0.10 U	--	--	0.10 U	--
Anthracene	4800	0.098 U	--	0.10 U	--	--	0.10 U	--
Benzo(g,h,i)perylene	--	0.0098 U	--	0.010 U	--	--	0.010 U	--
Fluoranthene	640	0.098 U	--	0.10 U	--	--	0.10 U	--
Fluorene	640	0.098 U	--	0.10 U	--	--	0.10 U	--
Naphthalene	160	0.098 U	--	0.10 U	--	--	0.10 U	--
Phenanthrene	--	0.098 U	--	0.10 U	--	--	0.10 U	--
Pyrene	480	0.098 U	--	0.10 U	--	--	0.10 U	--
Carcinogenic PAHs								
Benz(a)anthracene	--	0.0098 U	--	0.010 U	--	--	0.010 U	--
Benzo(a)pyrene	0.1	0.0098 U	--	0.010 U	--	--	0.010 U	--
Benzo(b)fluoranthene	--	0.0098 U	--	0.010 U	--	--	0.010 U	--
Benzo(j,k)fluoranthene	--	0.0098 U	--	0.010 U	--	--	0.010 U	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--
Chrysene	--	0.0098 U	--	0.010 U	--	--	0.010 U	--
Dibenzo(a,h)anthracene	--	0.0098 U	--	0.010 U	--	--	0.010 U	--
Indeno(1,2,3-cd)pyrene	--	0.0098 U	--	0.010 U	--	--	0.010 U	--
Total cPAHs TEQ[2]	0.1	ND	--	ND	--	--	ND	--
PCBAro								
Aroclor 1016	0.56	0.049 U	--	--	--	--	--	--
Aroclor 1221	--	0.049 U	--	--	--	--	--	--
Aroclor 1232	--	0.049 U	--	--	--	--	--	--
Aroclor 1242	--	0.049 U	--	--	--	--	--	--
Aroclor 1248	--	0.049 U	--	--	--	--	--	--
Aroclor 1254	0.022	0.049 U	--	--	--	--	--	--
Aroclor 1260	0.022	0.049 U	--	--	--	--	--	--
Total PCBs (Sum of Aroclors)	0.1	--	0.49 U	--	0.48 U	--	--	0.48 U
VOCs								
1,1,1,2-Tetrachloroethane	1.7	0.20 U	--	--	--	--	--	--
1,1,1-Trichloroethane	200	0.20 U	--	--	--	--	--	--

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

Sample Location		B7/MW7		B8/MW8		B9/MW9	B11/MW11	
Sample Date		11/12/2020	05/06/2021	11/14/2020	05/06/2021	05/06/2021	11/14/2020	05/06/2021
Sample Identification		MW7-111220	MW7-050621	MW8-111420	MW8-050621	MW9-050621	MW11-111420	MW11-050621
Analyte (by constituent group)	**MTCA Cleanup Levels for Ground Water[1]**							
1,1,2,2-Tetrachloroethane	0.22	0.20 U	--	--	--	--	--	--
1,1,2-Trichloroethane	0.77	0.20 U	--	--	--	--	--	--
1,1-Dichloroethane	7.7	0.20 U	--	--	--	--	--	--
1,1-Dichloroethene	400	0.20 U	--	--	--	--	--	--
1,1-Dichloropropene	--	0.20 U	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--	1.0 U	--	--	--	--	--	--
1,2,3-Trichloropropane	0.00038	0.20 U	--	--	--	--	--	--
1,2,4-Trichlorobenzene	1.5	0.20 U	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	0.055	1.0 U	--	--	--	--	--	--
1,2-Dibromoethane (EDB)	0.01	0.20 U	0.2 U	--	0.2 U	*0.2 U*	--	0.2 U
1,2-Dichlorobenzene	720	0.20 U	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	5	0.20 U	--	--	--	--	--	--
1,2-Dichloropropane	1.2	0.20 U	--	--	--	--	--	--
1,3-Dichlorobenzene	--	0.20 U	--	--	--	--	--	--
1,3-Dichloropropane	--	0.20 U	--	--	--	--	--	--
1,4-Dichlorobenzene	8.1	0.20 U	--	--	--	--	--	--
2,2-Dichloropropane	--	0.20 U	--	--	--	--	--	--
2-Chloroethyl Vinyl Ether	--	30 U	--	--	--	--	--	--
2-Chlorotoluene	160	0.20 U	--	--	--	--	--	--
4-Chlorotoluene	--	0.20 U	--	--	--	--	--	--
Bromobenzene	64	0.20 U	--	--	--	--	--	--
Bromochloromethane	--	0.20 U	--	--	--	--	--	--
Bromodichloromethane	0.71	0.20 U	--	--	--	--	--	--
Bromoform	5.5	1.0 U	--	--	--	--	--	--
Bromomethane	11	2.0 U	--	--	--	--	--	--
Carbon Tetrachloride	0.63	0.20 U	--	--	--	--	--	--
Chlorobenzene	160	0.20 U	--	--	--	--	--	--
Chloroethane	--	1.0 U	--	--	--	--	--	--
Chloroform	1.4	0.20 U	--	--	--	--	--	--
Chloromethane	--	1.0 U	--	--	--	--	--	--
cis-1,2-Dichloroethene (DCE)	16	0.20 U	0.2 U	--	0.2 U	*0.2 U*	--	0.2 U
cis-1,3-Dichloropropene	--	0.20 U	--	--	--	--	--	--
Dibromochloromethane	0.52	0.20 U	--	--	--	--	--	--
Dibromomethane	80	0.20 U	--	--	--	--	--	--
Dichlorodifluoromethane	1600	0.20 U	--	--	--	--	--	--
m,p-Xylenes	1600	1.0 U	--	1.0 U	--	--	1.0 U	--
Methyl tert-butyl ether (MTBE)	20	0.20 U	--	--	--	--	--	--
Methylene Chloride	5	1.0 U	--	--	--	--	--	--
Methyliodide	--	5.0 U	--	--	--	--	--	--

Table 7. Groundwater Data from Monitoring Wells

Project No. 210577, 2200 Cooper Point Road NW, Olympia, Washington

	Sample Location	B7/MW7		B8/MW8		B9/MW9	B11/MW11	
	Sample Date	11/12/2020	05/06/2021	11/14/2020	05/06/2021	05/06/2021	11/14/2020	05/06/2021
	Sample Identification	MW7-111220	MW7-050621	MW8-111420	MW8-050621	MW9-050621	MW11-111420	MW11-050621
Analyte (by constituent group)	**MTCA Cleanup Levels for Ground Water[1]**							
o-Xylene	1600	1.0 U	--	1.0 U	--	--	1.0 U	--
Tetrachloroethene (PCE)	5	0.20 U	0.2 U	--	0.2 U	*0.2 U*	--	0.2 U
trans-1,2-Dichloroethene	160	0.20 U	0.2 U	--	0.2 U	*0.2 U*	--	0.2 U
trans-1,3-Dichloropropene	--	0.20 U	--	--	--	--	--	--
Trichloroethene (TCE)	5	0.20 U	0.2 U	--	0.2 U	*0.2 U*	--	0.2 U
Trichlorofluoromethane	2400	0.20 U	--	--	--	--	--	--
Vinyl Chloride	0.2	0.20 U	0.2 U	--	0.2 U	*0.2 U*	--	0.2 U

Notes

All results in micrograms per liter, unless indicated otherwise.

Results in **bold** indicate concentrations of the analyte detected above the reporting limit (RL).

Results in *italics* indicate data that may not be representative of groundwater quality.

Blue shaded cells indicate concentrations of the analyte detected above the MTCA cleanup level.

ND - individual compounds not detected above the laboratory RL so a total concentration is not calculated.

[1]Washington State Model Toxics Control Act (MTCA) Method A or B Cleanup Levels for Groundwater (WAC 173-340)

[2]Total carcinogenic polycyclic aromatic hydrocarbon (cPAH) toxicity equivalent concentration (TEQ) calcualted per WAC 173-340-708(8) using 1/2 the RL for non-detect (ND) results.

U - Analyte not detected at or above the RL shown.

"--" - indicates data not available

Table 8. Groundwater Measurements and Elevation Data

Project No. 210577, 220 Cooper Point Road NW, Olympia, Washington

Well Identification	TOC Elevation (NAVD 88)	Sample Date	Depth to Water (feet below TOC)	Groundwater Elevation (NAVD 88)	Interpreted Lithologic Units
B1/MW1	244.92	11/9/2020	10.90	234.02	Native (0-15') - sand and silt with gravel
		5/6/2021	10.26	234.66	
B2/MW2	244.96	11/9/2020	12.50	232.46	Qvr (0-12' bgs) - sandy silt/clay with cobbles and gravel; Qvr (12-15')
		5/6/2021	11.31	233.65	
B3/MW3	247.8	11/9/2020	8.30	239.50	Fill (0-11') - peat and organic silt and clay with gravel, cobbles and wood fragments; Qt (11-15') - silty/sandy gravel
		5/6/2021	6.76	241.04	
B4/MW4	245.28	11/9/2020	12.30	232.98	Qvr (0-15') - silty sand with gravel, and sand
		5/6/2021	11.23	234.05	
B5/MW5	244.66	11/9/2020	11.40	233.26	Fill (0-5.5') - Gravel, peat (wood) and clay with gravel; Qvr (5.5-15') - sand
		5/6/2021	10.41	234.25	
B6/MW6	243.57	11/9/2020	9.80	233.77	Fill (0-7') - Sandy silt with gravel, cobbles, and asphalt; Qvr (7-15') - sand
		5/6/2021	9.17	234.40	
B7/MW7	244.52	11/9/2020	10.80	233.72	Fill (0-10') - Sandy silt, clay, and gravel, concrete, woody debris; Qvr (10-15') - sand
		5/6/2021	9.92	234.60	
B8/MW8	248.59	11/9/2020	6.50	242.09	Fill (0-6') - silt and sand with gravel, cobbles, woody debris, and concrete; Qvr (6-15') - gravel
		5/6/2021	6.17	242.42	
B9/MW9	253.1	11/9/2020	14.10	239.00	Fill (0-7.5) - silty sand with gravel, woody debris, and concrete; Qt (7.5-15) - silty and silty sand
		5/6/2021	12.85	240.25	
B10/MW10	257.25	11/9/2020	DRY	--	Fill (0-7') - clay, gravel and woody debris; Qt (7-15) - gravel and sand
		5/6/2021	14.83	242.42	
B11/MW11	241.72	11/9/2020	4.40	237.32	Qt (0-15') - silty gravel, clay, and sand
		5/6/2021	3.16	238.56	

Notes

TOC = Top of well casing

-- = Not available

All monitoring wells screened from 5 to 15 feet below ground surface.

Qt = glacial till

Qvr - glacial recessional outwash

Table 9. Soil COPCs and RI Screening Levels

Project No. 210577, 220 Cooper Point Road NW, Olympia, Washington

Analyte	Soil Method A Unrestricted Land Use (Table 740-1) (mg/kg)	Soil Method B Direct Contact Noncancer (Eq. 740-1) (mg/kg)	Soil Method B Direct Contact Cancer (Eq. 740-2) (mg/kg)	Site Soil Screening Level[1]
Petroleum Hydrocarbons				
Diesel-range petroleum hydrocarbons	2000			2000
Oil-range petroleum hydrocarbons	2000			2000
TPH-D+O	2000			2000
Gasoline-range petroleum hydrocarbons, benzene present	30			30
Gasoline-range petroleum hydrocarbons, no benzene present	100			100
Metals				
Arsenic	20	24	0.67	20
Barium		16000		16000
Cadmium	2	80		2
Chromium (total)				--
Chromium (III)	2000	120000		2000
Chromium (VI)	19	240	0.38	19
Copper		3200		3200
Lead	250			250
Manganese		3700		3700
Mercury	2			2
Nickel		1600		1600
Selenium		400		400
Silver		400		400
Polycyclic Aromatic Hydrocarbons (PAHs)				
Acenaphthene		4800		4800
Anthracene		24000		24000
Fluoranthene		3200		3200
Fluorene		3200		3200
Methyl naphthalene;1-		5600	34	34
Methyl naphthalene;2-		320		320
Naphthalene	5	1600		5
Pyrene		2400		2400
Carcinogenic PAHs (cPAHs)				
Benzo(a)anthracene				
Benzo(a)pyrene	0.10	24	0.19	0.1
Benzo(b)fluoranthene				
Benzo(k)fluoranthene				
Chrysene				
Dibenz(a,h)anthracene				
Indeno(1,2,3-cd)pyrene				
Total cPAH TEQ	0.10	24	0.19	0.1
Polychlorinated Biphenyls (PCBs)				
Aroclor 1016		5.6	14	5.6
Aroclor 1254		1.6	0.50	0.5
Aroclor 1260			0.50	0.5
Total PCBs	1.0		0.50	1.0
Pentachlorophenol				
Pentachlorophenol		400	2.5	2.5
Volatile Organic Compounds				
Acetone		72000		72000
Benzene	0.03	320	18	0.03
Bromobenzene		640		640
Bromodichloromethane		1600	16	16
Bromoform		1600	130	130
Bromomethane		110		110
Carbon tetrachloride		320	14	14
Chlorobenzene		1600		1600
Chloroform		800	32	32
Chloromethane				
Chlorotoluene;o-		1600		1600
Chlorotoluene;p-		1600		1600
Dibromochloromethane		1600	12	12
Dichlorobenzene;1,2-		7200		7200
Dichlorobenzene;1,3-				0
Dichlorobenzene;1,4-		5600	190	190
Dichlorodifluoromethane		16000		16000
Dichloroethane;1,2- (EDC)		480	11	11
Dichloroethylene;1,2-,cis		160		160
Dichloroethylene;1,2-,trans		1600		1600
Dichloropropane;1,2-		3200	27	27
Dichloropropane;1,3-		1600		1600
Dichloropropene;1,3-		2400	10	10
Ethyl chloride				
Ethylbenzene	6	8000		6
Ethylene dibromide (EDB)	0.005	720	0.50	0.005
Hexachlorobutadiene		80	13	13
Hexanone;2-		400		400
Methyl ethyl ketone		48000		48000
Methyl isobutyl ketone		6400		6400
Methyl tert-butyl ether (MTBE)	0.10		560	0.10
Methylene bromide		800		800
Methylene chloride	0.02	480	94	0.02
Propylbenzene;n-		8000		8000
sec-butylbenzene		8000		8000
Styrene		16000		16000
tert-butylbenzene		8000		8000
Tetrachloroethane;1,1,1,2-		2400	38	38
Tetrachloroethane;1,1,2,2-		1600	5	5
Tetrachloroethylene	0.05	480	480	0.05

Table 9. Soil COPCs and RI Screening Levels

Project No. 210577, 220 Cooper Point Road NW, Olympia, Washington

Analyte	Soil Method A Unrestricted Land Use (Table 740-1) (mg/kg)	Soil Method B Direct Contact Noncancer (Eq. 740-1) (mg/kg)	Soil Method B Direct Contact Cancer (Eq. 740-2) (mg/kg)	Site Soil Screening Level[1]
Toluene	7	6400		7
Trichlorobenzene;1,2,3-		64		64
Trichlorobenzene;1,2,4-		800	34	34
Trichloroethane;1,1,1-	2	160000		2
Trichloroethane;1,1,2-		320	18	18
Trichloroethylene	0.03	40	12	0.03
Trichlorofluoromethane		24000		24000
Trichloropropane;1,2,3-		320	0.0063	0.0063
Trimethylbenzene;1,2,4-		800		800
Trimethylbenzene;1,3,5-		800		800
Vinyl Chloride		240	0.67	0.67
xylene;m-		16000		16000
xylene;o-		16000		16000
xylene;p-		16000		16000
xylenes	9	16000		9

[1]Site Soil Screening Levels for the remedial investigation (RI) are the default human health cleanup levels established by the Washington State Department of Ecology under the Model Toxics Control Act cleanup regulation (Chapter 173-340 of the Washington Administrative Code [WAC 173-340]). The Site Soil Screening Level is the Method A soil cleanup level for unrestricted land use, where established, or the lowest of the standard Method B formula values, from Ecology's CLARC data tables, updated July 2022.

Table 10. Groundwater COPCs and RI Screening Levels

Project No. 210577, 220 Cooper Point Road NW, Olympia, Washington

Analyte	Ground Water Method A (Table 720-1) (µg/L)	Ground Water Method B Noncancer (Eq. 720-1) (µg/L)	Ground Water Method B Cancer (Eq. 720-2) (µg/L)	Natural Background (µg/L)	Site Groundwater Screening Level
Petroleum Hydrocarbons					
Diesel-range petroleum hydrocarbons	500				500
Oil-range petroleum hydrocarbons	500				500
TPH-D+O	500				500
Gasoline-range petroleum hydrocarbons, benzene present	800				800
Gasoline-range petroleum hydrocarbons, no benzene present	1000				1000
Metals					
Arsenic	5	4.8	0.058	8	8
Barium		3200			3200
Cadmium	5	8			5
Chromium (total)	50				50
Chromium (III)		24000			24000
Chromium (VI)		48	0.046		0.046
Copper		640			640
Iron		11000			11000
Lead	15				15
Manganese		750			750
Mercury	2				2
Nickel		320			320
Selenium		80			80
Silver		80			80
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene		480			480
Anthracene		2400			2400
Fluoranthene		640			640
Fluorene		320			320
Methyl naphthalene;1-		560	1.5		1.5
Methyl naphthalene;2-		32			32
Naphthalene	160	160			160
Pyrene		240			240
Carcinogenic PAHs (cPAHs)					
Benzo(a)anthracene					
Benzo(a)pyrene	0.10	4.80	0.02		0.1
Benzo(b)fluoranthene					
Benzo(k)fluoranthene					
Chrysene					
Dibenz(a,h)anthracene					
Indeno(1,2,3-cd)pyrene					
Total cPAH TEQ	0.10	4.80	0.02		0.1
Pentachlorophenol					
Pentachlorophenol		80	0.22		0.22
Polychlorinated Biphenyls (PCBs)					
Aroclor 1016		0.56	0.63		0.56
Aroclor 1254		0.16	0.022		0.022
Aroclor 1260			0.022		0.022
Total PCBs	0.10		0.02		0.10
Volatile Organic Compounds					
Acetone		7200			7200
Benzene	5	32	0.80		5
Bromobenzene		64			64
Bromodichloromethane		160	0.71		0.71
Bromoform		160	5.50		5.5
Bromomethane		11			11
Carbon tetrachloride		32	0.63		0.63
Chlorobenzene		160			160
Chloroform		80	1.40		1.4
Chloromethane					0
Chlorotoluene;o-		160			160
Chlorotoluene;p-		160			160
Dibromochloromethane		160	0.52		0.52
Dichlorobenzene;1,2-		720			720
Dichlorobenzene;1,3-					0
Dichlorobenzene;1,4-		560	8.10		8.1
Dichlorodifluoromethane		1600			1600
Dichloroethane;1,2- (EDC)	5	48	0.48		5
Dichloroethylene;1,2-,cis		16			16
Dichloroethylene;1,2-,trans		160			160
Dichloropropane;1,2-		320	1.2		1.2
Dichloropropane;1,3-		160			160
Dichloropropene;1,3-		240	0.44		0.44
Ethyl chloride					
Ethylbenzene	700	800			700
Ethylene dibromide (EDB)	0.01	72	0.02		0.01
Hexachlorobutadiene		8	0.56		0.56
Hexanone;2-		40			40
Methyl ethyl ketone		4800			4800
Methyl isobutyl ketone		640			640
Methyl tert-butyl ether (MTBE)	20		24		20
Methylene bromide		80			80
Methylene chloride	5	48	5.8		5
Propylbenzene;n-		800			800
sec-butylbenzene		800			800
Styrene		1600			1600
tert-butylbenzene		800			800
Tetrachloroethane;1,1,1,2-		240	1.7		1.7
Tetrachloroethane;1,1,2,2-		160	0.22		0.22
Tetrachloroethylene	5	48	21		5
Toluene	1000	640			1000
Trichlorobenzene;1,2,3-		6.4			6.4
Trichlorobenzene;1,2,4-		80	1.5		1.5
Trichloroethane;1,1,1-	200	16000			200
Trichloroethane;1,1,2-		32	0.77		0.77
Trichloroethylene	5	4	0.54		5
Trichlorofluoromethane		2400			2400
Trichloropropane;1,2,3-		32	0.00038		0.00038
Trimethylbenzene;1,2,4-		80			80
Trimethylbenzene;1,3,5-		80			80
Vinyl Chloride	0.20	24	0.029		0.2
xylene;m-		1600			1600
xylene;o-		1600			1600
xylene;p-		1600			1600
xylenes	1000	1600			1000

[1]Site Groundwater Screening Levels for the remedial investigation (RI) are the default human health cleanup levels established by the Washington State Department of Ecology under the Model Toxics Control Act cleanup regulation (Chapter 173-340 of the Washington Administrative Code [WAC 173-340]). The Site Groundwater Screening Level is the Method A groundwater cleanup level for unrestricted land use, where established, or the lowest of the standard Method B formula values, from Ecology's CLARC data tables, updated July 2022, adjusted for natural background.

Table 11. Sediment COPCs and RI Screening Levels

Project No. 210577, 220 Cooper Point Road NW, Olympia, Washington

Analyte	SMS Freshwater Sediment Criteria[a]		Human Health Beach Play Sediment Screening Levels[c]	
	SCO	CSL	SCO	CSL
Conventional Pollutants	mg/kg dw		mg/kg dw	
Ammonia	230	300		
Total sulfides	39	61		
Metals	mg/kg dw		mg/kg dw	
Arsenic	14	120	2	21
Cadmium	2.1	5.4	220	220
Chromium	72	88	16[d]	160[d]
Copper	400	1,200	27,000	27,000
Lead	360	>1,300[b]	250[e]	250[e]
Mercury	0.66	0.8		
Nickel	26	110	13,000	13,000
Selenium	11	> 20[b]	3,300	3,300
Silver	0.57	1.7	3,300	3,300
Zinc	3200	>4,200[b]	200,000	200,000
Organic and Chlorinated Organic Chemicals	µg/kg dw		µg/kg dw	
2,4-Dimethylphenol			2,200,000	2,200,000
2-Methylphenol			5,600,000	5,600,000
4-Methylphenol[f]	260	2,000	11,000,000	11,000,000
Benzoic acid	2,900	3,800	450,000,000	450,000,000
Benzyl alcohol			11,000,000	11,000,000
Pentachlorophenol	1,200	>1,200[b]	1,400	14,000
Phenol	120	210	33,000,000	33,000,000
1,2,4-Trichlorobenzene			270,000	2,700,000
1,2-Dichlorobenzene			60,000,000	60,000,000
1,4-Dichlorobenzene			1,400,000	14,000,000
Dibenzofuran	200	680	670,000	670,000
Hexachlorobenzene			4,900	49,000
Hexachlorobutadiene			100,000	670,000
N-nitrosodiphenylamine			270,000	2,700,000
Phthalates	µg/kg dw		µg/kg dw	
Bis(2-Ethylhexyl)phthalate	500	22,000	93,000	930,000
Butylbenzyl phthalate			680,000	6,800,000
Diethyl phthalate			89,000,000	89,000,000
Dimethyl phthalate				
Di-n-butyl phthalate	380	1,000	11,000,000	11,000,000
Di-n-octyl phthalate	39	>1,100[b]	1,100,000	1,100,000
Pesticides and PCBs	µg/kg dw		µg/kg dw	
beta-Hexachlorocyclohexane	7.2	11	720	7,200
Carbazole	900	1,100		
Dieldrin	4.9	9.3	81	810
Endrin ketone	8.5		33,000[f]	33,000[f]
Total Aroclor	110	2,500	490	4,900
Total o,p' and p,p' dichlorodiphenyldichloroethanes (DDDs)	310	860	5,400	54,000
Total o,p' and p,p' dichlorodiphenyldichloroethylenes (DDEs)	21	33	23,000	230,000
Total o,p' and p,p' dichlorodiphenyltrichloroethanes (DDTs)	100	8,100	9,200	92,000
Polycyclic Aromatic Hydrocarbons (PAHs)	µg/kg dw		µg/kg dw	
Total PAHs	17,000	30,000		
Total LPAH				
2-Methylnaphthalene			360,000	360,000
Acenaphthene			5,400,000	5,400,000
Acenaphthylene				
Anthracene			27,000,000	27,000,000
Fluorene			3,600,000	3,600,000
Naphthalene			1,800,000	1,800,000
Phenanthrene				
Total HPAH				
Benz[a]anthracene			[g]	[g]
Benzo[a]pyrene			[g]	[g]
Benzo[g,h,i]perylene			[g]	[g]
Chrysene			[g]	[g]
Dibenzo[a,h]anthracene			[g]	[g]
Fluoranthene			3,600,000	3,600,000
Indeno[1,2,3-c,d]pyrene			[g]	[g]
Pyrene			2,700,000	2,700,000
Total cPAH TEQ			170	1700
Total benzofluoranthenes			[g]	[g]

Notes:

All values are dry weight (dw) normalized

[a]Freshwater sediment criteria for protection of the benthic community from Table 8-1 of SCUM (Ecology, 2021).

[b]"greater than" value indicates that the upper bound toxicity level is unknown, but is known to be above the concentration shown

[c]Human health beach play sediment screening levels calculated with equations and exposure parameters from SCUM Section 9.2.2.1 (Ecology, 2021). EPA RSL gastrointestinal absorption conversion factor and dermal absorption fractions were used. All other chemical specific values and all toxicity values were from CLARC (Ecology, 2023).

[d]Hexavalent chromium

[e]Method A soil screening level

[f]Endrin screening level

[g]cPAHs evaluated as Total cPAH TEQ

CLARC = cleanup levels and risk calculation
COPCs = constituents of potential concern
cPAH = carcinogenic PAHs
CSL = cleanup screening level
EPA = United States Environmental Protection Agency
HPAH = high-molecular weight PAHs
LPAH = low-molecular weight PAHs
RI = remedial investigation
RSL = regional screening levels
SCO = sediment cleanup objective
SMS = Sediment Management Standards, WAC 173-204
TEQ = toxicity equivalence
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Washington State Department of Ecology, 2021, Sediment Cleanup User's Manual (SCUM), Guidance for Implementing the Cleanup Provisions of the Sediment Management Standards, Chapter 173-204, Publication No. 12-09-057, Third Revision,

Washington State Department of Ecology, 2023, Cleanup Levels and Risk Calculation (CLARC). January 2023.

Table 12. Surface Water COPCs and RI Screening Levels

Project No. 210577, 220 Cooper Point Road NW, Olympia, Washington

Analyte	Surface Water Method B Noncancer (Eq. 730-1) (µg/L)	Surface Water Method B Cancer (Eq. 730-2) (µg/L)	Surface Water Human Health Fresh Water 173-201A WAC (µg/L)	Surface Water Human Health Fresh Water 40 CFR 131.45 (µg/L)	Surface Water Human Health Fresh Water CWA §304 (µg/L)	Other Applicable Criteria (µg/L)[1]	Surface Water Site Screening Level[2]
Petroleum Hydrocarbons							
Diesel-range petroleum hydrocarbons						3000	3000
Oil-range petroleum hydrocarbons						3000	3000
TPH-D+O						3000	3000
Gasoline-range petroleum hydrocarbons, benzene present						1000	1000
Gasoline-range petroleum hydrocarbons, no benzene present						1000	1000
Metals							
Arsenic	18	0.098	10	0.018	0.018	8	8
Barium					1000		1000
Cadmium	41						41
Chromium (total)							
Chromium (III)	240000						240000
Chromium (VI)	490	0.13					0.13
Copper	2900		1300		1300		1300
Iron							
Lead							
Manganese					50		50
Mercury							
Nickel	1100		150	80	610		80
Selenium	2700		120	60	170		60
Silver	26000						26000
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	640		110	30	70		30
Anthracene	26000		3100	100	300		100
Fluoranthene	90		16	6	20		6
Fluorene	3500		420	10	50		10
Methyl naphthalene;1-							
Methyl naphthalene;2-							
Naphthalene	4900						4900
Pyrene	2600		310	8	20		8
Carcinogenic PAHs (cPAHs)							
Benzo(a)anthracene			0.014	0.00016	0.0012		0.00016
Benzo(a)pyrene	26	0.04	0.0014	0.000016	0.00012		0.000016
Benzo(b)fluoranthene			0.014	0.00016	0.0012		0.00016
Benzo(k)fluoranthene			0.014	0.0016	0.012		0.0016
Chrysene			1.40	0.016	0.12		0.016
Dibenz(a,h)anthracene			0.0014	0.000016	0.00012		0.000016
Indeno(1,2,3-cd)pyrene			0.014	0.00016	0.0012		0.00016
Total cPAH TEQ	26	0.04	0.0014	0.000016	0.00012		0.000016
Pentachlorophenol							
Pentachlorophenol	1200	1.5	0.046	0.002	0.03		0.002
Polychlorinated Biphenyls (PCBs)							
Aroclor 1016	0.0058	0.003					0.003
Aroclor 1254	0.0017	0.0001					0.0001
Aroclor 1260							
Total PCBs		0.0001	0.00017	0.000007	0.000064		0.000007
Volatile Organic Compounds							
Acetone							
Benzene	2000	23	0.44		0.58	10	0.44
Bromobenzene							0.00
Bromodichloromethane	14000	28	0.77	0.73	0.95		0.73
Bromoform	14000	220	5.8	4.60	7		4.60
Bromomethane	970		520	300	100		100.00
Carbon tetrachloride	550	4.9	0.2		0.4		0.20
Chlorobenzene	5000		380	100	100		100.00
Chloroform	6900	56	260	100	60		56.00
Chloromethane							
Chlorotoluene;o-							
Chlorotoluene;p-							
Dibromochloromethane	14000	21	0.65	0.60	0.80		0.60
Dichlorobenzene;1,2-	4200		2000	700.00	1000.00		700
Dichlorobenzene;1,3-			13	2.00	7.00		2
Dichlorobenzene;1,4-	3300	22	460	200.00	300.00		22
Dichlorodifluoromethane							
Dichloroethane;1,2- (EDC)	13000	59	9.3	8.90	9.90		8.9
Dichloroethylene;1,2-,cis							
Dichloroethylene;1,2-,trans	33000		600	200.00	100.00		100
Dichloropropane;1,2-	25000	43	0.71		0.90		0.71
Dichloropropane;1,3-							
Dichloropropene;1,3-	41000	34	0.24	0.22	0.27		0.22
Ethyl chloride							
Ethylbenzene	6900		200	29.00	68.00	12	12
Ethylene dibromide (EDB)							
Hexachlorobutadiene	930	30	0.69	0.01	0.01		0.01
Hexanone;2-							
Methyl ethyl ketone							
Methyl isobutyl ketone							
Methyl tert-butyl ether (MTBE)							
Methylene bromide							
Methylene chloride	17000	590	16.00	10.00	20.00		10
Propylbenzene;n-							
sec-butylbenzene							
Styrene							
tert-butylbenzene							
Tetrachloroethane;1,1,1,2-							
Tetrachloroethane;1,1,2,2-	10000	6.5	0.12	0.10	0.20		0.10
Tetrachloroethylene	500	100	4.90	2.40	10.00		2.4
Toluene	19000		180.00	72.00	57.00	53	53
Trichlorobenzene;1,2,3-							
Trichlorobenzene;1,2,4-	230	2	0.12	0.04	0.07		0.04
Trichloroethane;1,1,1-	930000		47000.00	20000.00	10000.00		10000
Trichloroethane;1,1,2-	2300	25	0.44	0.35	0.55		0.35
Trichloroethylene	120	4.9	0.38	0.30	0.60		0.3
Trichlorofluoromethane							
Trichloropropane;1,2,3-							
Trimethylbenzene;1,2,4-							
Trimethylbenzene;1,3,5-							
Vinyl Chloride	6600	3.7	0.02		0.02		0.020
xylene;m-							
xylene;o-							
xylene;p-							
xylenes						57	57

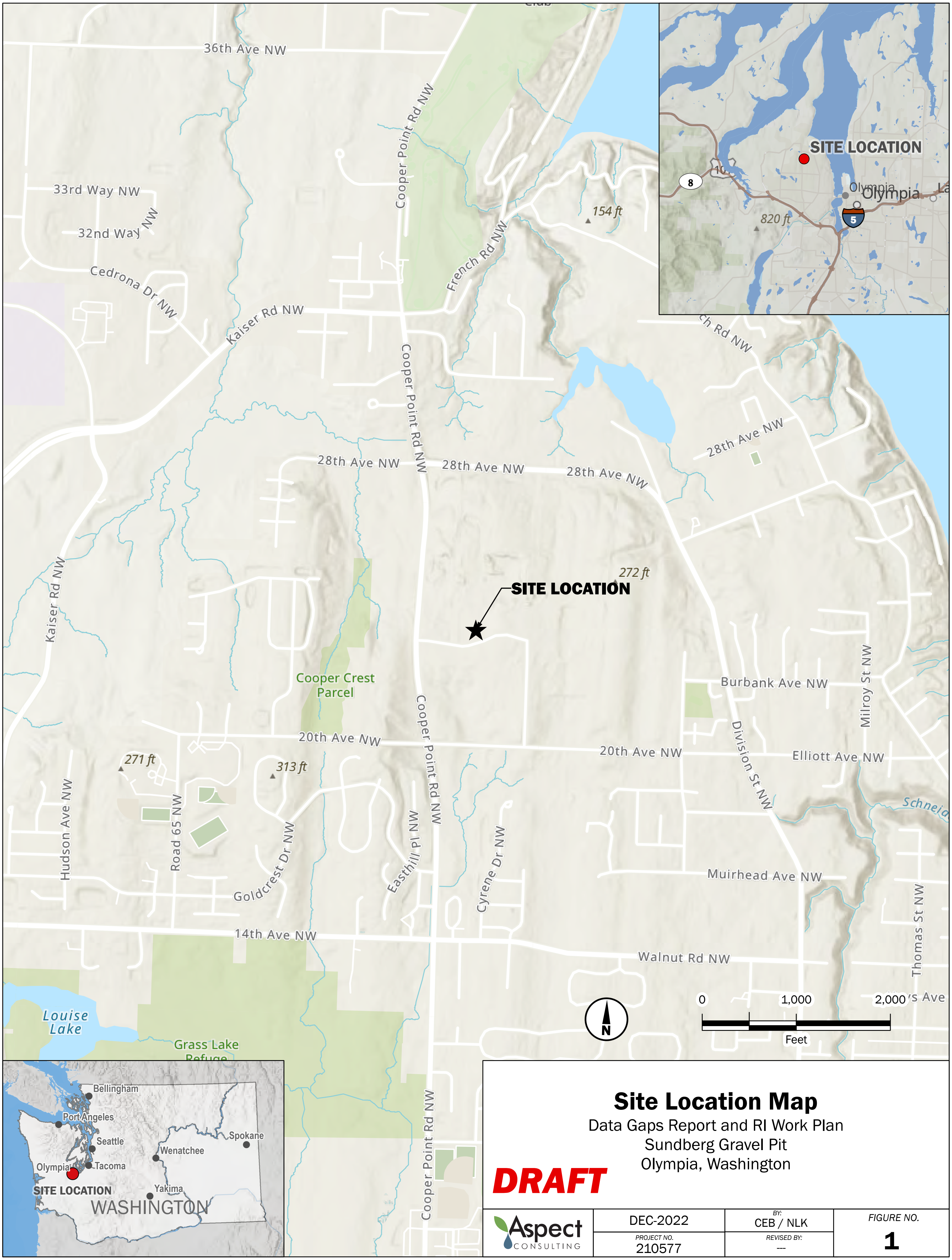
Notes

µg/L - micrograms per liter

[1]For petroleum hydrocarbons, benzene, toluene, and ethylbenzene: concentrations of gasoline and weathered diesel range organics predicted to be protective of aquatic receptors in surface water, freshwater, Ecology Implementation Memorandum No. 23 (2021). For arsenic, natural background groundwater arsenic concentrations in Washington State, Ecology 2022.

[2]Site Surface Water Screening Levels for the remedial investigation (RI) are the lowest of the surface water critera, adjusted for background.

FIGURES



36th Ave NW
33rd Way NW
32nd Way NW
Cedrona Dr NW
Kaiser Rd NW
Cooper Point Rd NW
French Rd NW
154 ft
28th Ave NW
272 ft
SITE LOCATION
Cooper Crest
Parcel
Burbank Ave NW
Milroy St NW
20th Ave NW
Division St NW
Elliott Ave NW
271 ft
313 ft
Hudson Ave NW
Road 65 NW
Goldcrest Dr NW
Easthill Pl NW
Cyrene Dr NW
Muirhead Ave NW
14th Ave NW
Walnut Rd NW
Thomas St NW
Louise
Lake
Grass Lake
N
0
1,000
2,000
Feet
8
Olympia
820 ft
5
Bellingham
Port Angeles
Seattle
Spokane
Wenatchee
Tacoma
Olympia
Yakima
WASHINGTON
Site Location Map
Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington
DRAFT
Aspect
CONSULTING
DEC-2022
BY:
CEB / NLK
FIGURE NO.
1
PROJECT NO.
210577
REVISED BY:

Approximate limits of historical land disturbance (inferred from LiDAR)

Approximate location of former Underground Storage Tank (UST) and petroleum-impacted soil stockpile

Approximate limits of former garage (1980s-2010s)

Approximate limits of former garage area

Historical Shed/Shack Area (1960-1990)

Former Residence

Subject Property

Thurston County Tax Parcel

N

0 100 200 Feet

Subject Property Map showing Historical Features

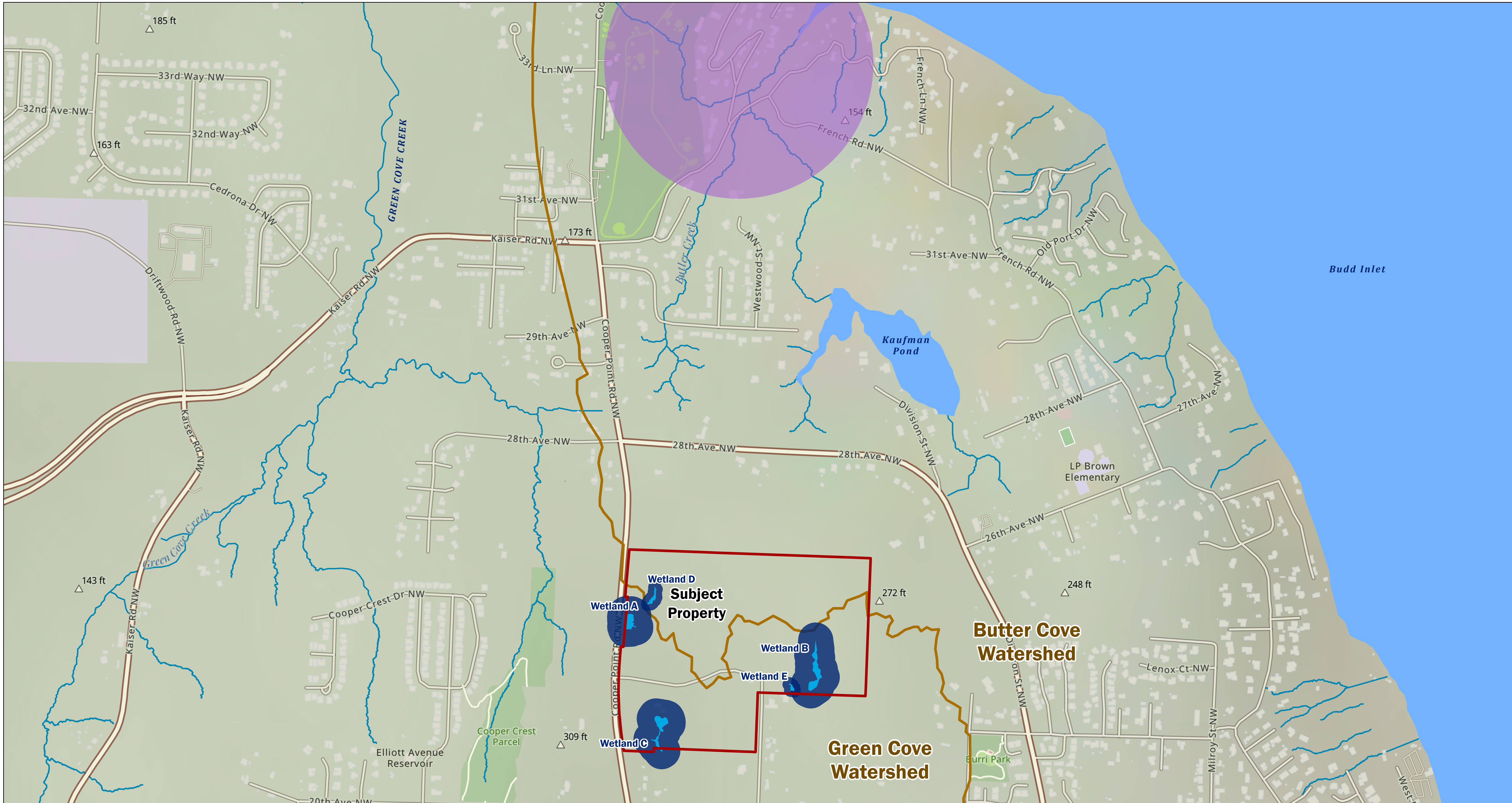
Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

DRAFT

Aspect CONSULTING

DEC-2022	BY: CEB / NLK	FIGURE NO. 2
PROJECT NO. 210577	REVISED BY: - - - / - - -	

Data source credits: None || Basemap Service Layer Credits: NA



Wellhead Protection Area
Wetland Boundary
Wetland Buffer
Green Cove Watershed
Stream
Subject Property

DRAFT

Surface Waters and Wellhead Protection Area Map

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

Aspect CONSULTING	DEC-2022 PROJECT NO. 210577	BY: CEB / NLK REVISED BY: - - - / - - -	FIGURE NO. 3

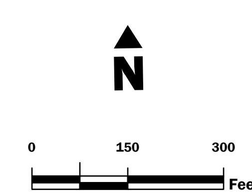
2017 WESTERN WASHINGTON LIDAR

2003 AERIAL IMAGE

Approximate limits of historical land disturbance (inferred from LiDAR)

Potential areas of historical land disturbance (based on aerial photographs)

Subject Property



Land Disturbance Area Maps

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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Aspect Consulting

MAY-2023	BY: CEB / NLK	FIGURE NO. 4
PROJECT NO. 210577	REVISED BY: - - - / - - -	

Data source credits: None || Basemap Service Layer Credits: NA

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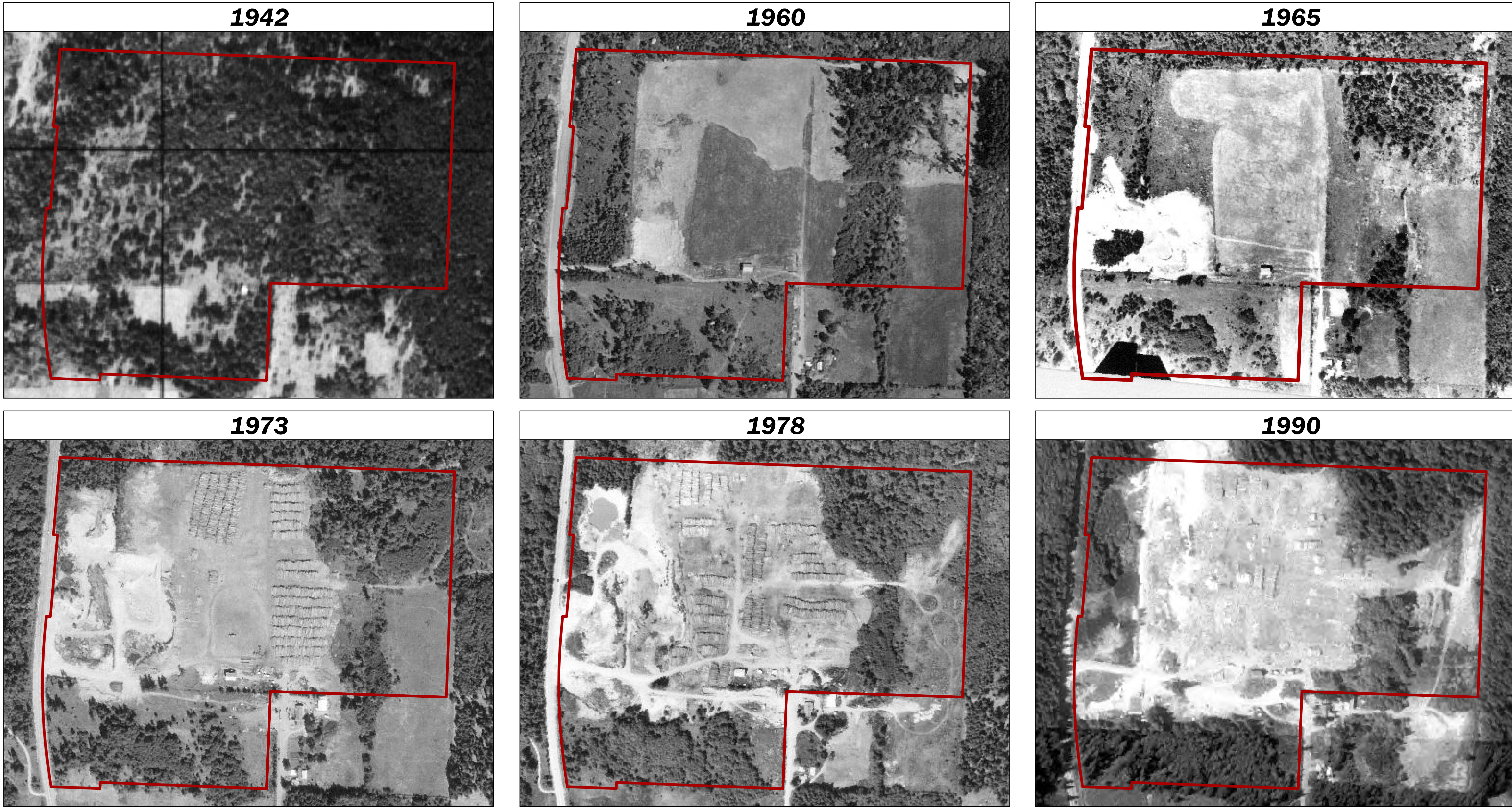

Aerial Photos 1942-1990

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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Aspect CONSULTING	DEC-2022	BY: CEB / NLK	FIGURE NO.
	PROJECT NO. 210577	REVISED BY: - - - / - - -	5a

2003

2005

2006

2009

2013

2018

Note: Aerial photos from Google Earth.

Aerial Photos 2003-2018

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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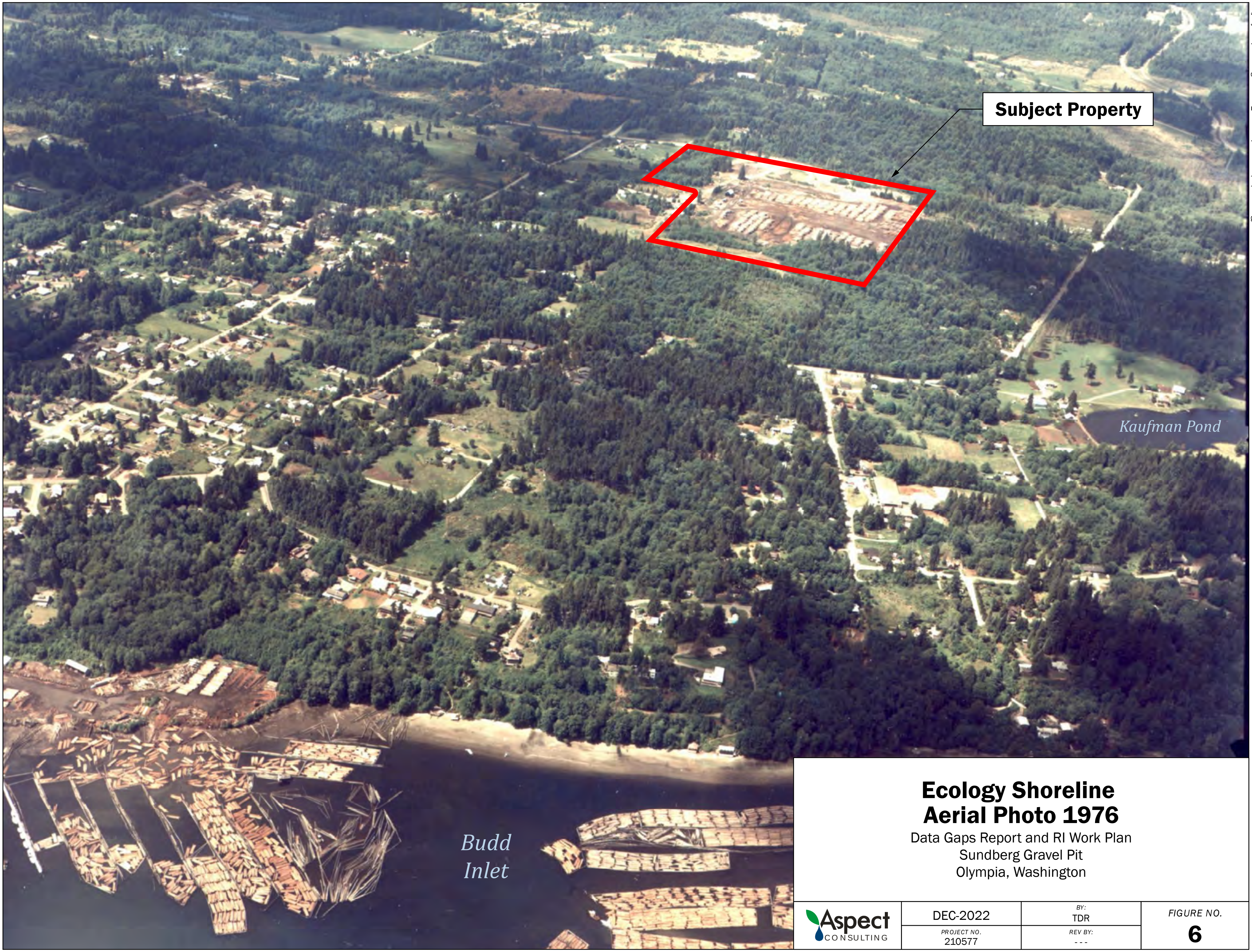
Aspect CONSULTING	DEC-2022	BY: CEB / NLK	FIGURE NO.
	PROJECT NO. 210577	REVISED BY: - - - / - - -	**5b**

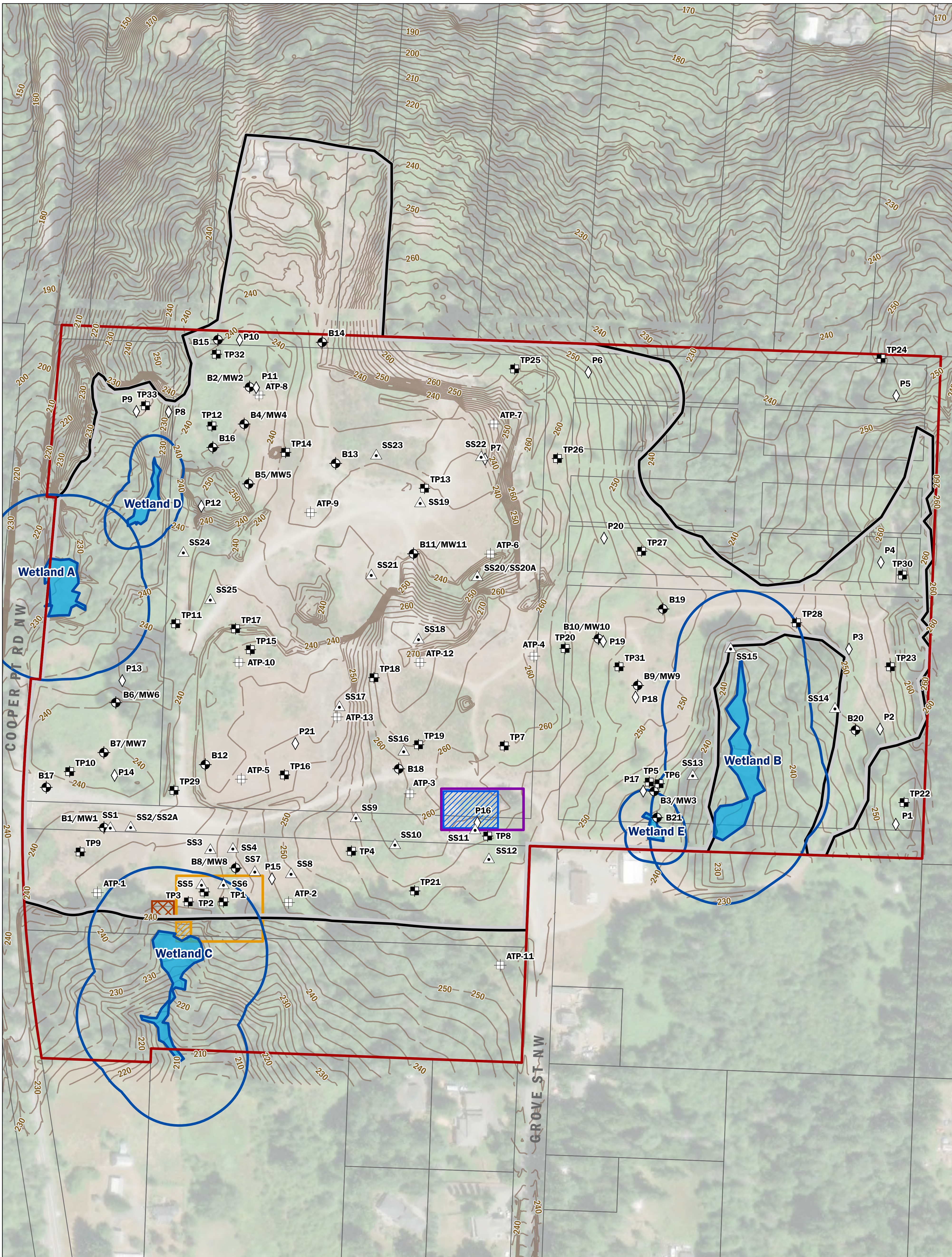


Ecology Shoreline Aerial Photo 1976

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

Aspect CONSULTING	DEC-2022	BY: TDR	FIGURE NO. 6
	PROJECT NO. 210577	REV BY: - - -	

G:\projects\SundbergGravelPit_210577\Delivered\AI\04 Ecology Shoreline Aerial Photo 1976.ai



- Soil Boring/Monitoring Well (AEG 2020/2021)
- Surface Soil Sample (AEG 2020/2021)
- Test Pit (RNS 2008)
- Test Pit (PR 2007)
- Test Pit (Ages 2015)
- Wetland Boundary
- Wetland Buffer
- Subject Property
- Thurston County Tax Parcel
- Approximate limits of historical land disturbance (inferred from LiDAR)
- Approximate location of former Underground Storage Tank (UST) and petroleum-impacted soil stockpile
- Approximate limits of former garage (1980s-2010s)
- Approximate limits of former garage area
- Historical Shed/Shack Area (1960-1990)
- Former Residence
- 2-foot Contours

N

0 100 200 Feet

Note: Locations are approximate.

Map Showing Exploration Locations

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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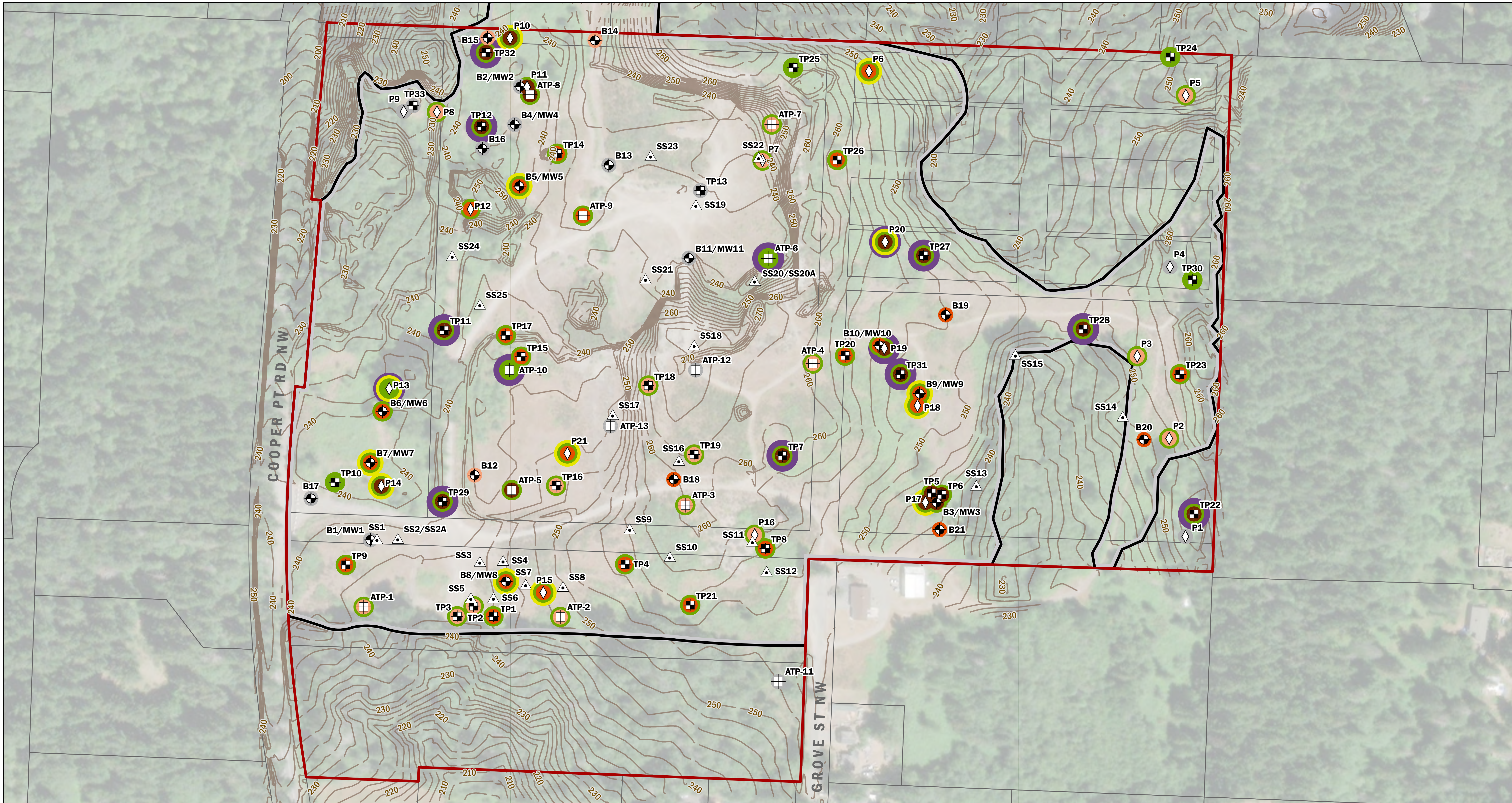
DEC-2022	BY: CEB / NLK	FIGURE NO.
PROJECT NO. 210577	REVISED BY: - - - / - - -	7

Data source credits: None || Basemap Service Layer Credits: Maxar, Microsoft



Soil Boring/Monitoring Well (AEG 2020/2021)

Surface Soil Sample (AEG 2020/2021)

Test Pit (RNS 2008)

Test Pit (PR 2007)

Test Pit (Ages 2015)

Fill

0 feet

0-5 feet

5-10 feet

10-15 feet

Presence of Wood/Woody Debris

Presence of Construction Debris

Thickness Currently Undetermined

Approximate limits of historical land disturbance (inferred from LiDAR)

Subject Property

2-foot Contours

Thurston County Tax Parcel

N

0 100 200 Feet

Note: Locations are approximate.

Map Showing Subsurface Observations

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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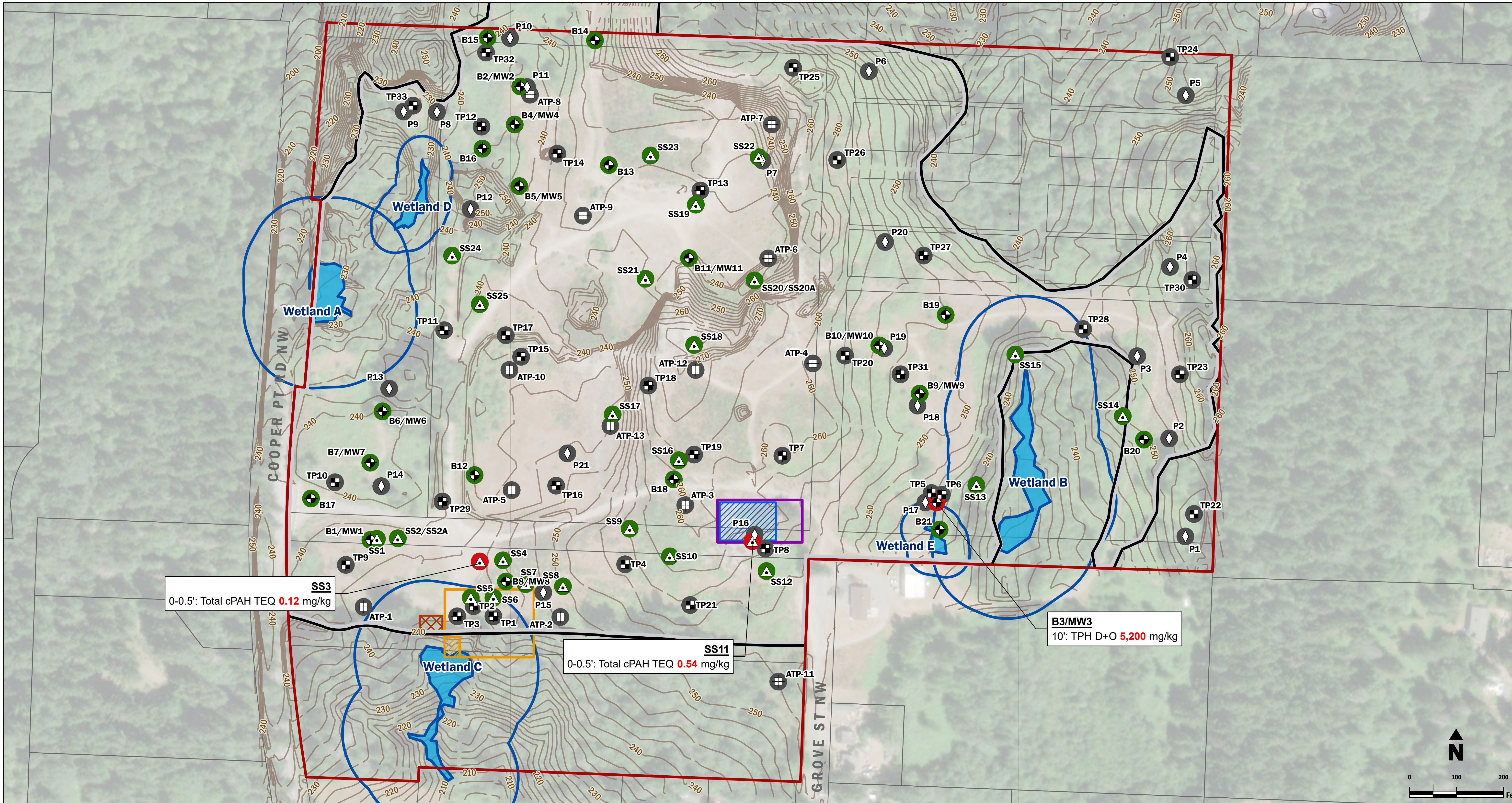
MAY-2023	BY: CEB / NLK	FIGURE NO.
PROJECT NO. 210577	REVISED BY: - - - / - - -	8

Data source credits: None || Basemap Service Layer Credits: Maxar, Microsoft

ArcGIS Pro: G:\projects\SundbergGravelPit_210577\Delivered\Revised RIWP\RevisedRI_Sundberg.aprx || NAD 1983 StatePlane Washington South FIPS 4602 Feet || Date Saved: 5/24/2023 || Exported 5/24/2023 16:51 by nkochie



Soil Boring/Monitoring Well (AEG 2020/2021)
Surface Soil Sample (AEG 2020/2021)
Test Pit (RNS 2008)
Test Pit (PR 2007)
Test Pit (Ages 2015)

Soil Analytical Results
One or more tested contaminants above Soil Cleanup Levels
All tested contaminants below Soil Cleanup Levels
No Soil Data

Approximate limits of historical land disturbance (inferred from LiDAR)
Approximate location of former Underground Storage Tank (UST) and petroleum-impacted soil stockpile
Approximate limits of former garage (1980s-2010s)
Approximate limits of former garage area

Historical Shed/Shack Area (1960-1990)
Former Residence
Wetland Boundary
Wetland Buffer
Subject Property

2-foot Contours
Thurston County Tax Parcel

SS3
0-0.5': Total cPAH TEQ 0.12 mg/kg

Notes:
- Soil data shown for locations where contaminants detected above Soil Cleanup Levels, sample depth shown in feet below ground surface
- total cPAH TEQ = total carcinogenic polycyclic aromatic hydrocarbon toxic equivalent concentration
- TPH-D+O = total diesel-range extended petroleum hydrocarbons
- mg/kg - milligrams per kilogram
- Locations are approximate

Map Showing Soil Analytical Results
Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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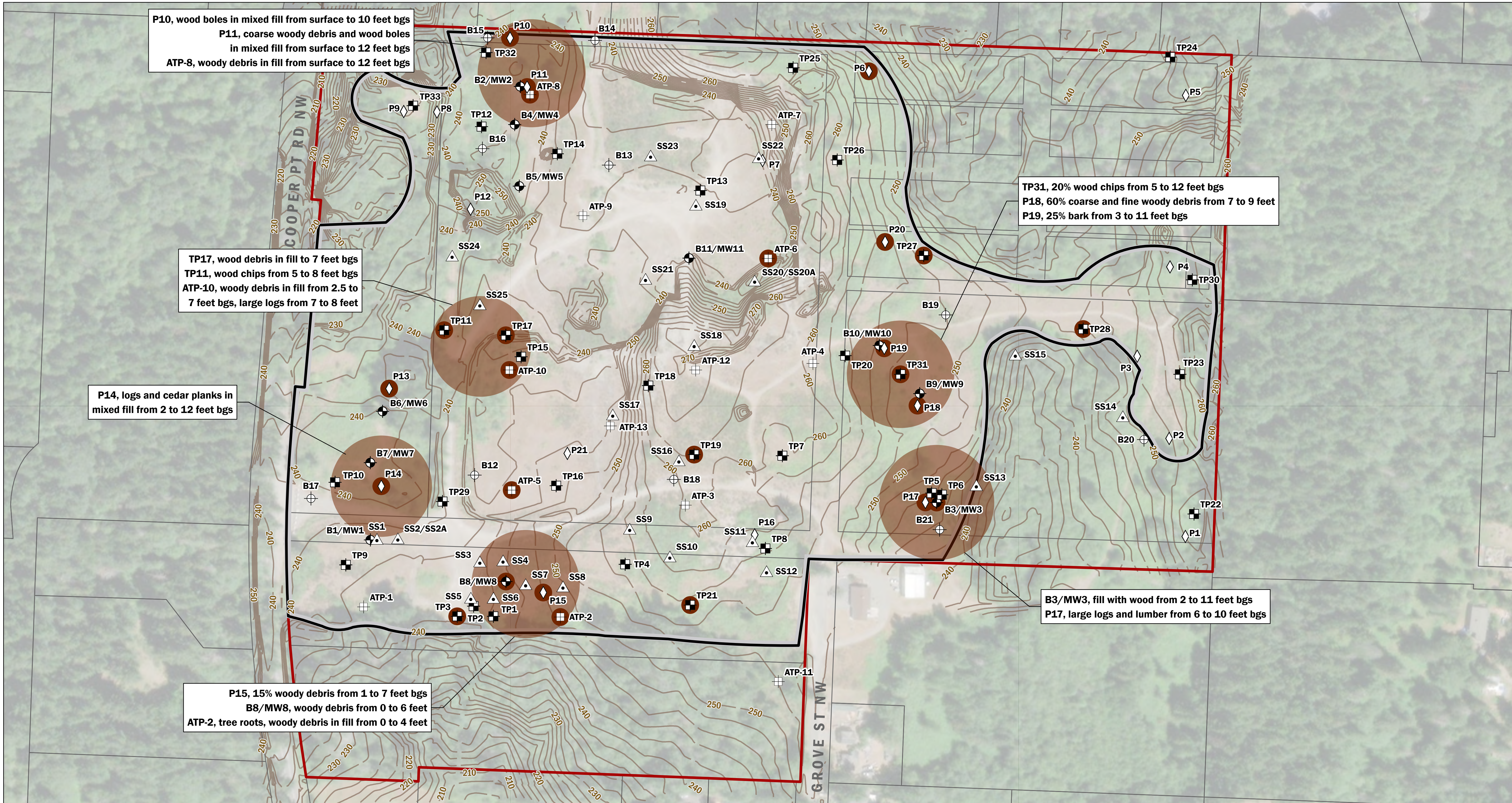
Aspect Consulting	MAY-2023	BY: CEB / NLK	FIGURE NO. 9
	PROJECT NO. 210577	REVISED BY: - - - / - - -	

Data source credits: None || Basemap Service Layer Credits: Maxar, Microsoft



- Surface Soil Sample (AEG 2020/2021)
- Soil Boring (AEG 2020)
- Monitoring Well (AEG 2020)
- Test Pit (RNS 2008)
- Test Pit (PR 2007)
- Test Pit (Ages 2015)
- Presence of Wood/Woody Debris
- Descriptions of buried wood debris in representative areas of the Subject Property for the identification of methane sampling locations
- Approximate limits of historical land disturbance (inferred from LiDAR)
- Subject Property
- 2-foot Contours
- Thurston County Tax Parcel

Note: Locations are approximate.

N

0 100 200 Feet

Locations of Buried Wood Debris and Representative Areas for Methane Sampling

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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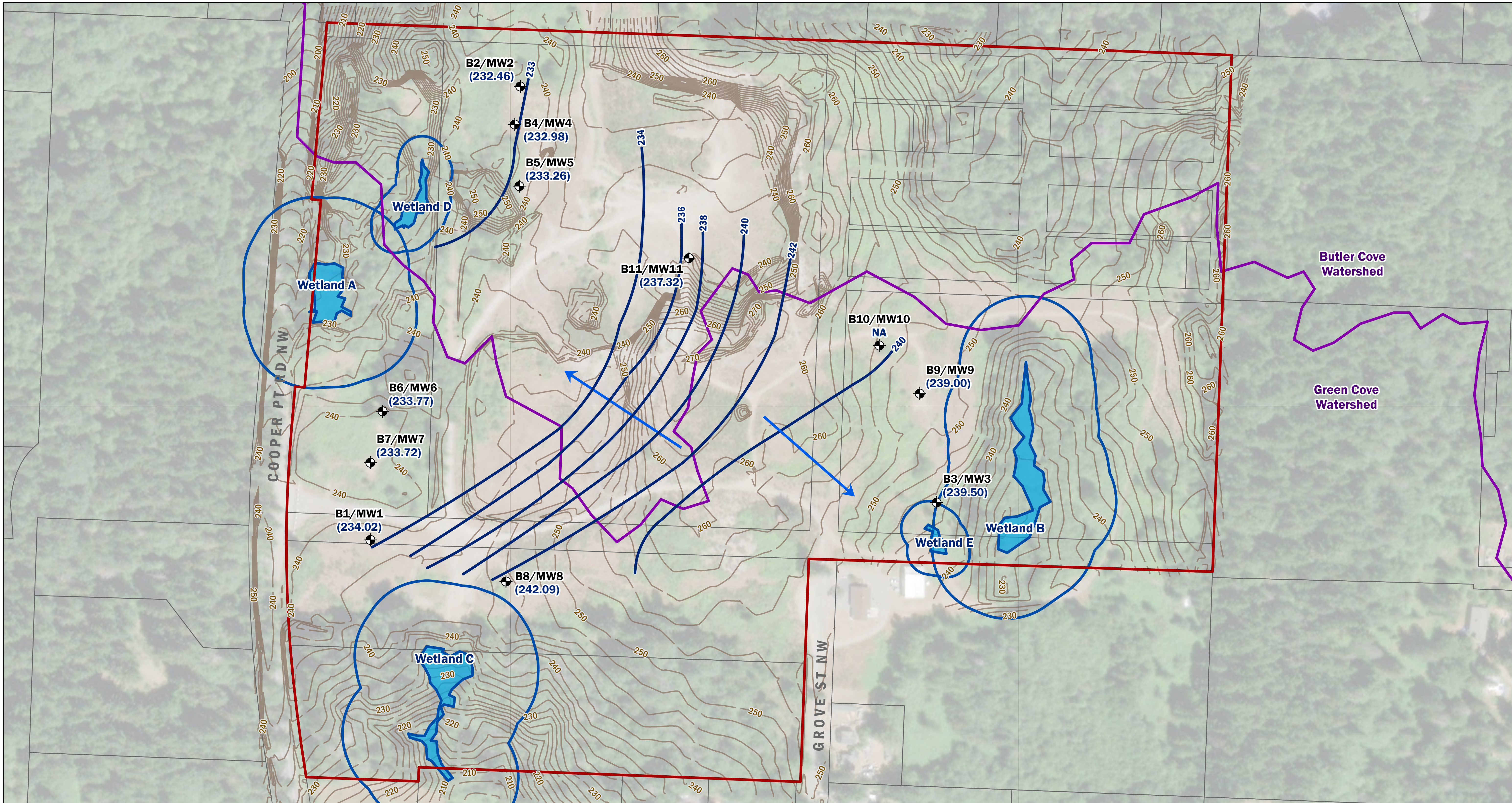
MAY-2023	BY: CEB / NLK	FIGURE NO.
PROJECT NO. 210577	REVISED BY: - - - / - - -	10



Monitoring Well (AEG 2020)
Groundwater Contour
Groundwater Flow Direction
Wetland Boundary
Wetland Buffer
Green Cove Watershed
2-foot Contours
Subject Property
Thurston County Tax Parcel

(232.46) Groundwater elevation in NAVD88 based on water levels measured in monitoring wells on November 9, 2020

N

0 100 200 Feet

Groundwater Elevation Contour Map (November 2020)

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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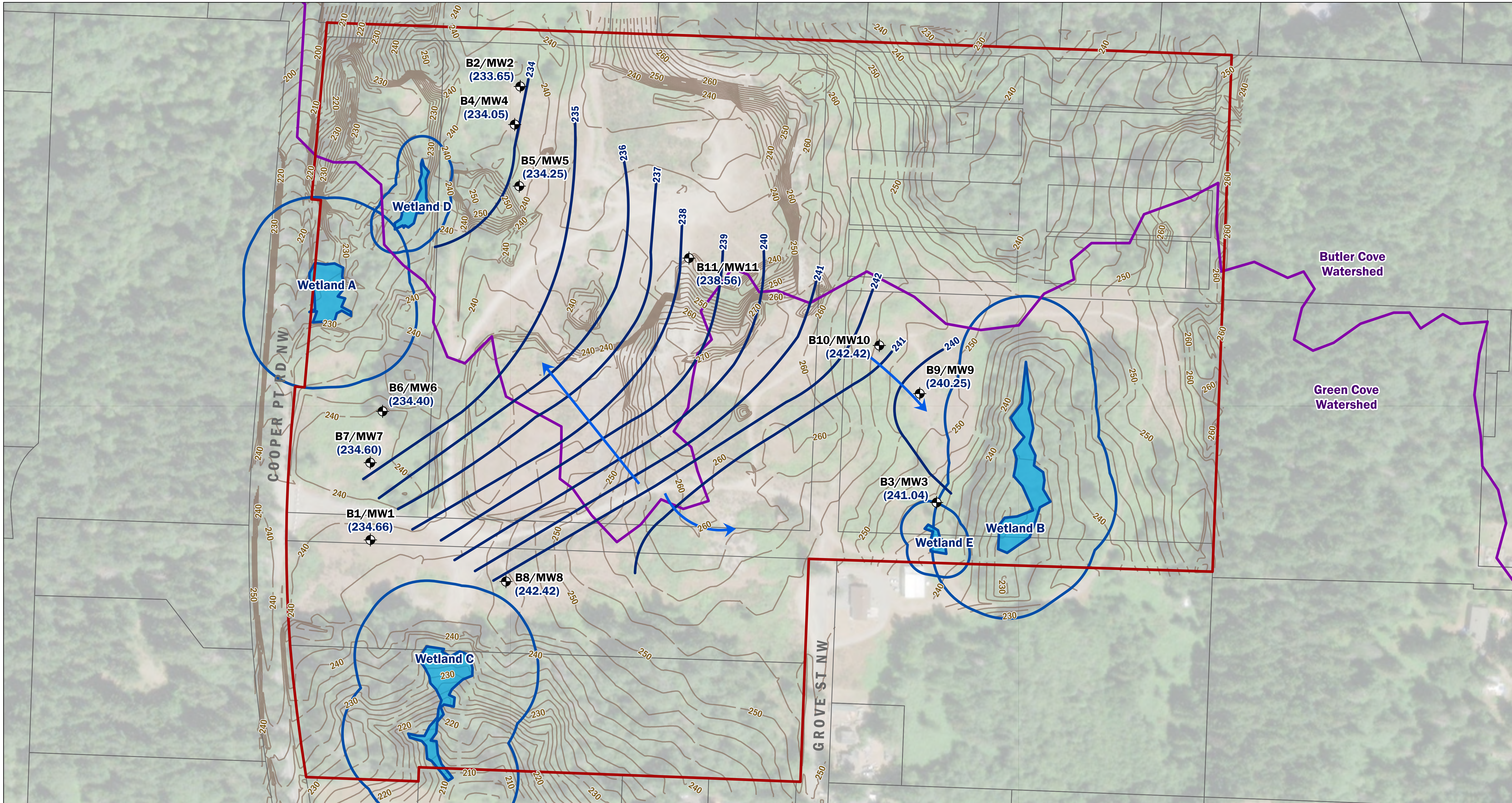
MAY-2023	BY: CEB / NLK	FIGURE NO.	
PROJECT NO. 210577	REVISED BY: ---/---	11	



Monitoring Well (AEG 2020)
Groundwater Contour
Groundwater Flow Direction
Wetland Boundary
Wetland Buffer
Green Cove Creek Watershed Boundary
2-foot Contours
Subject Property
Thurston County Tax Parcel

(233.65) Groundwater elevation in NAVD88 based on water levels measured in monitoring wells on May 6, 2021

N

0 100 200 Feet

Groundwater Elevation Contour Map (May 2021)

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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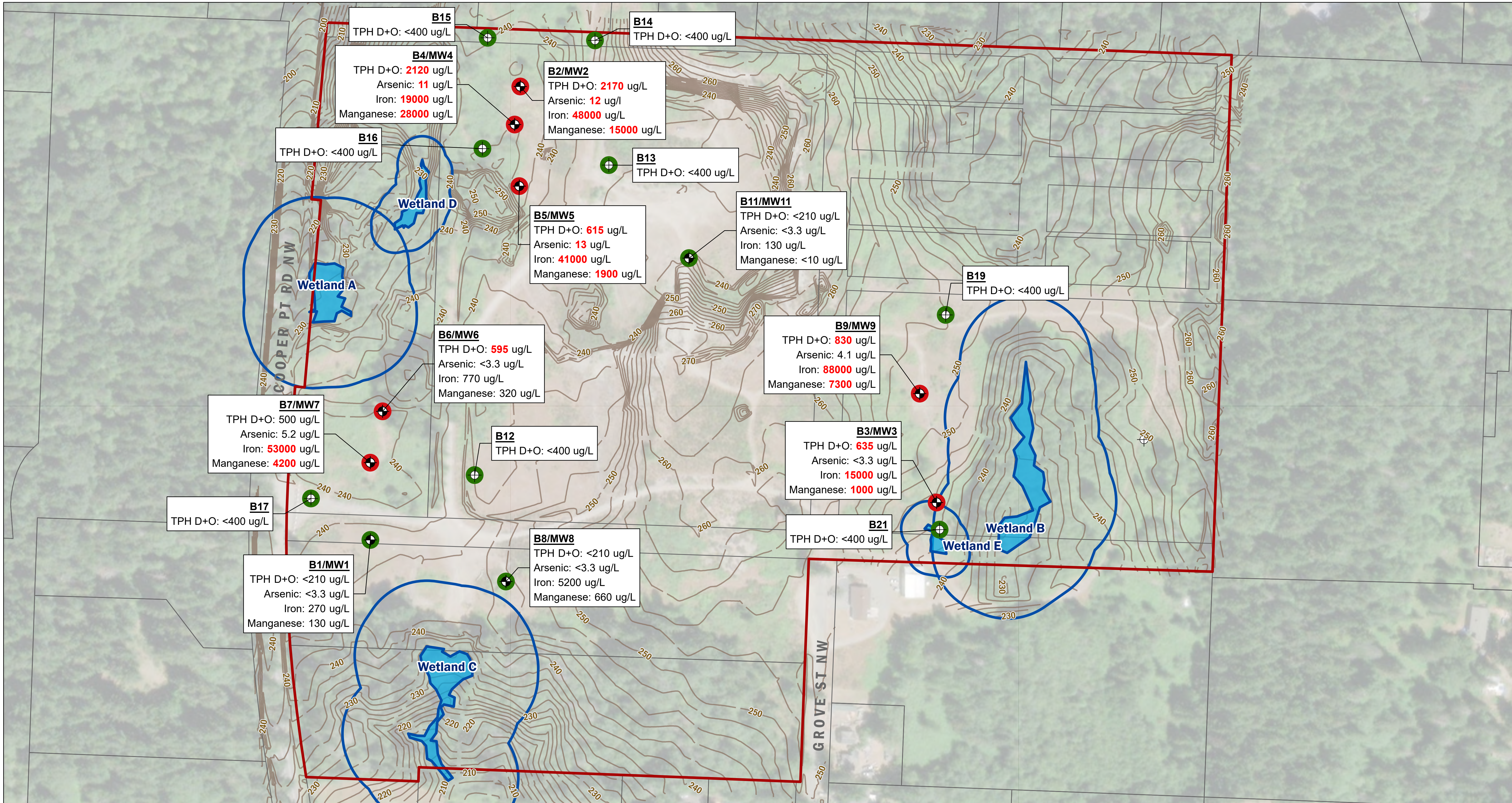
MAY-2023	BY: CEB / NLK	FIGURE NO. 12
PROJECT NO. 210577	REVISED BY: - - - / - - -	



Monitoring Well (AEG 2020)
Soil Boring (AEG 2020)

Groundwater Analytical Results

One or more contaminants detected above Groundwater Cleanup Levels

Contaminants not detected above Groundwater Cleanup Levels

Wetland Boundary
Wetland Buffer
2-foot Contours
Subject Property
Thurston County Tax Parcel

B2/MW2
TPH D+O: 2170 ug/L
Arsenic: 12 ug/l
Iron: 48000 ug/L
Manganese: 15000 ug/L

COPC Detected Above the Groundwater Cleanup Level

Highest Reported Concentration of COPC

Note: Groundwater data shown for total petroleum hydrocarbons in reconnaissance groundwater samples collected from borings and all tested constituents in samples collected from monitoring wells. Metals in reconnaissance samples are not shown because of the potential elevated results attributable to inherent turbidity of grab samples.

N

0 100 200 Feet

Map Showing Groundwater Analytical Results

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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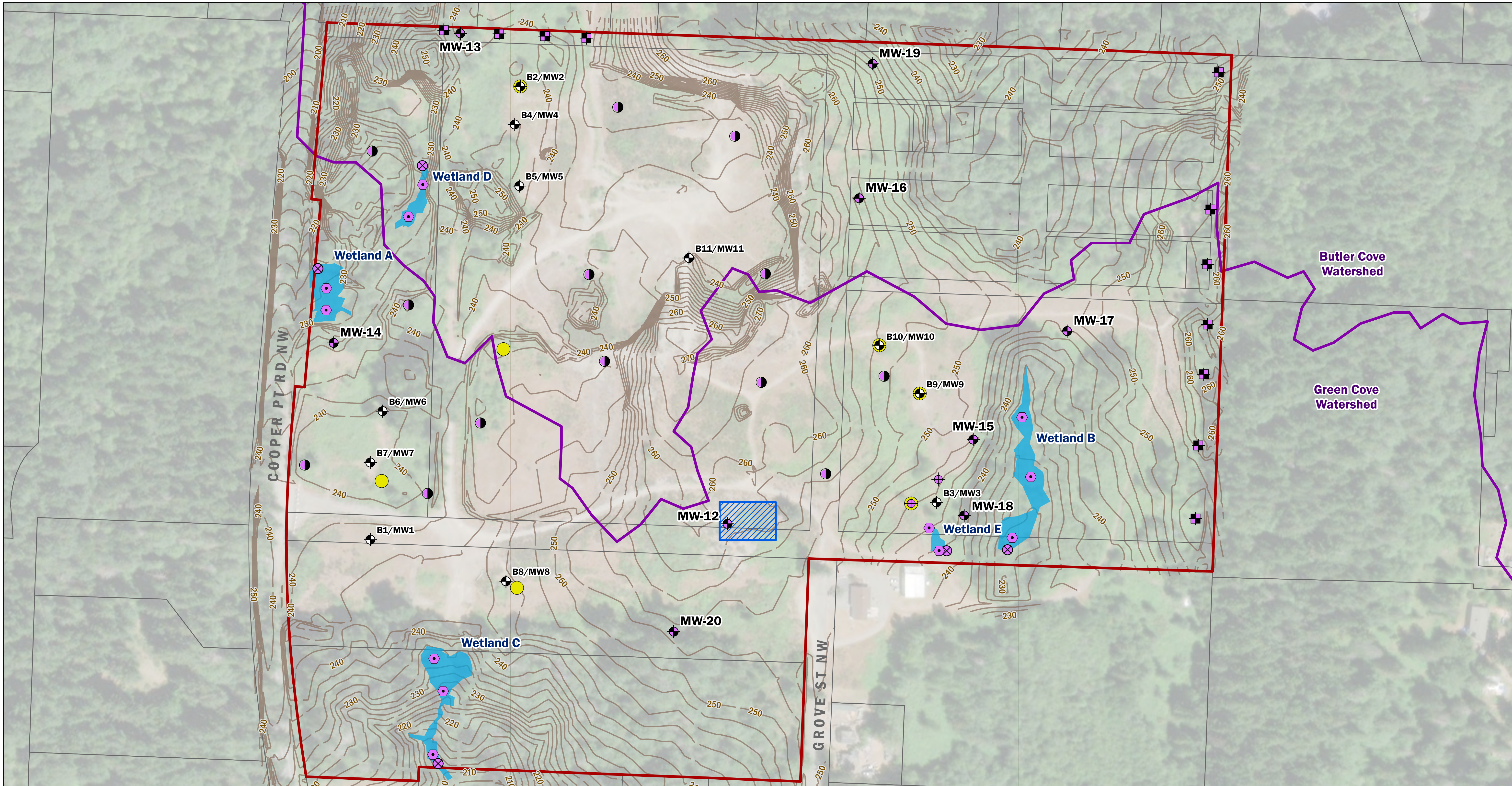
Aspect CONSULTING

MAY-2023
PROJECT NO. 210577

BY: CEB / NLK
REVISED BY: - - - / - - -

FIGURE NO. 13



Proposed Explorations

- Soil Boring Location
- Test Pit Exploration Location
- Monitoring Well Location
- Fill Investigation Location
- Preliminary Wetland Sediment Sampling Station
- Preliminary Wetland Surface Water Sample Location

- Methane Sample Location
- Existing Monitoring Well (AEG 2020/2021)
- Approximate location of former Underground Storage Tank (UST) and petroleum-impacted soil stockpile
- Wetland Boundary
- Green Cove Watershed

- 2-foot Contours
- Subject Property
- Thurston County Tax Parcel

Note: Locations are approximate.

N

0 100 200 Feet

Remedial Investigation Approach

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

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MAY-2023	BY: CEB / NLK	FIGURE NO.
PROJECT NO. 210577	REVISED BY: - - - / - - -	14

APPENDIX A

Sampling and Analysis Plan

Contents – Appendix A

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List of Figures

List of Attachments

A.1. Introduction

Aspect Consulting LLC (Aspect) has prepared this Sampling and Analysis Plan (SAP) for the Sundberg Gravel Pit, generally located at 2200 Cooper Point Road NW in Olympia, Washington (the Subject Property; Figure 1). The Subject Property is comprised of approximately 53 acres; portions of which have been historically used for sand and gravel mining and reclamation, including equipment parking and vehicle fueling, and log storage.

This SAP has been prepared as Appendix A to the "Data Gap Report and Remedial Investigation Work Plan, Sundberg Gravel Pit" (RI Work Plan) to describe specific sampling and analysis protocols for field sampling and quality assurance for chemical and physical analysis. This work is being completed under the direction of Washington State Department of Ecology (Ecology) in accordance with the requirements of the Washington State Model Toxics Control Act (MTCA) Cleanup Regulation, Chapter 173-340 of the Washington Administrative Code (WAC 173-340), and the Sediment Management Standards (SMS), WAC 173-204. The work is being conducted in accordance with the Agreed Order No. DEXXXXX (Agreed Order) between Ecology and Green Cove Park LLC.

This document is comprised of two major components: a Field Sampling Plan (FSP) defining field protocols, and a Quality Assurance Project Plan (QAPP) defining analytical protocols. It is the responsibility of Aspect personnel and subcontracted analytical laboratory personnel performing the RI sampling and analysis activities to adhere to the requirements of the SAP and QAPP. The FSP (Section A.2) and QAPP (Section A.3) are presented below.

A.2. Field Sampling Plan

The purpose of the FSP is to describe the field sample collection, handling, and laboratory analysis procedures that will be conducted during the execution of the RI Work Plan to meet the project-specific data quality objectives (DQOs) in accordance with the requirements of MTCA (WAC 173-340-820) and the SMS (WAC 173-204-600). It is the responsibility of the project personnel performing or overseeing the sampling and analysis activities to adhere to the requirements of this FSP.

A.2.1. Soil Sample Collection

Soil samples will be collected throughout the RI from test pits and borings for soil classification and field screening (Section A.2.1.3) and laboratory analysis (Section A.2.1.4). A general description of the sample collection procedures is summarized in the following sections.

All soil samples to be submitted for volatile organic compound (VOC) analyses will be collected in accordance with U.S. Environmental Protection Agency (EPA) Method 5035A. The soil aliquot for volatile organic carbon analysis will be collected from the undisturbed soil sample core using a laboratory-supplied modified disposable plastic syringe as required by the EPA Method 5035A and placed in preweighed laboratory supplied vials. For all other analyses, discrete soil samples will be removed from the sampler or backhoe bucket using a decontaminated stainless-steel spoon or a freshly gloved hand. Gravel-sized material greater than approximately 0.5-inch will be removed from the sample. An aliquot of the soil will be placed into certified-clean jars supplied by the analytical laboratory.

QC soil samples (e.g., field duplicates, rinsate blanks, and trip blanks) will be collected at the respective frequencies prescribed in Section 3.5.

A.2.1.1. Text Pit Exploration

Test pit explorations will be completed through fill materials and into native soils, where practicable, to a minimum depth of 6 feet bgs unless health and safety considerations (e.g., sidewall sloughing) dictate otherwise. Each test pit will be approximately 3-feet wide and 12-feet in length. The test pit excavations may extend deeper than 6 feet bgs, if native soil is not encountered at/above that depth, to evaluate the thickness and quality of fill. The maximum depth of the test pits will be dependent on observations made during the investigation, the subsurface lithology and the limitations of the equipment given the location and surface conditions of the exploration. If the test pit cannot be completed because of debris, sloughing soil or other impediments, the exploration location and/or type will be modified to meet the investigation objectives.

Soils from test pits will be logged and screened for evidence of contamination, as described in Section A.2.1.3, and samples will be collected for chemical analysis, as described in Section A.2.1.4. The subsurface conditions, including soil type, the presence of buried wood or other debris, and field screening results will be documented on a test pit log and in photographs. Following sample collection and field logging, each test pit will be backfilled with soil excavated from it.

A.2.1.2. Sonic/Hollow-Stem Auger

The drilling method will be dependent on the exploration location and objective and recommendations from the drilling contractor on which method is likely to be most successful at meeting the project objectives. A combination of direct-push and/or either sonic or hollow-stem auger drilling methods will be utilized.

If sonic drilling methods are employed, soil samples will be collected continuously in 5-foot intervals to the total depth of the exploration using a 3- to 4-inch diameter sampling core barrel inside an outer sonic drill casing. The sampling core barrel is driven by a high-frequency, vibrating sonic head, driven by hydraulic motors, in conjunction with rotational and downforce. The benefits of sonic over hollow-stem auger drilling methods include generation of smaller volumes investigation-derived waste, ability to reach greater depths and recover better core samples in dense soils, and ease of using temporary conductor casing to minimize potential contaminant drawdown from contaminated zones to clean zones.

If hollow-stem auger is employed, soil samples will be collected at 2.5-foot depth intervals to the total depth of exploration using a 2-inch-outside-diameter split-spoon sample tube driven into the ground at the bottom of a borehole by blows from a 140-or 300-pound slide hammer falling through a distance of 30 inches. The sample tube is driven 18 inches into the ground and the number of blows needed for the tube to penetrate each 6-inch increment is recorded. The sum of the number of blows required for the second plus third 6-inch increments of penetration is termed the "standard penetration resistance" or the "N-value". If 50 blows are insufficient to advance it through a 6-inch interval, the penetration after 50 blows is recorded. The split spoon sampler is decontaminated after each sample is collected. Hollow-stem auger drilling methods are quicker and more cost effective for drilling and installing relatively shallow wells, compared to sonic drilling methods, and collected blow counts can provide valuable information regarding the physical soil properties. Hollow-stem auger drilling rigs are more readily available than sonic drilling rigs in the region, and come in a wide variety of sizes and specifications for drilling on sites with access or safety limitations (low overhead clearance, ground stability concerns, etc.).

Soils from sonic/hollow-stem auger borings will be logged and screened for evidence of contamination, and samples will be collected for chemical analysis, as described in Section A.2.1.4. Following sample collection and field logging each boring will either be backfilled with bentonite chips/hydrated bentonite, placed from the total depth of each boring to the ground surface, or completed as a groundwater monitoring well. For borings not completed as monitoring wells, the ground surface will be patched with concrete or asphalt, or left as bare ground, to match the surrounding surface.

A.2.1.3. Soil Classification and Field Screening

A geologist from Aspect will oversee the drilling and excavation activities and prepare a geologic boring or test pit log for each of the explorations completed. The field representative will visually classify the soils in accordance with ASTM International, Inc (ASTM) Method D2488 and record soil descriptions, field screening results, and other relevant details (e.g., staining, debris, odors, etc.) on the appropriate field form. If samples are collected for chemical analysis, the sample ID and depth will also be recorded on the log.

In addition to soil classification, the field representative will screen the soil using a photoionization detector (PID) to monitor for the presence of volatile organic vapors. The PID will be calibrated daily in the field using the manufacturer’s calibration standard (100 ppm isobutylene gas). A calibration test, referred to as a “bump test”, will be performed as necessary in the field using the calibration gas to check that the PID remains properly calibrated throughout the day.

Soil samples will be field screened for presence of petroleum using visual examination and water sheen tests. Water sheen tests are conducted by placing a small aliquot of soil (about a tablespoon) into a cup or tray containing water, gently shaking, and watching for presence of petroleum sheen. Care will be taken to differentiate sheen created by petroleum (iridescent swirl of colors, does coalesce after being disturbed) versus other organic matter (angular “waxy” sheets”, do not coalesce after being disturbed), and recording the information appropriately. The perceived magnitude of petroleum sheen (slight, moderate, heavy) will be recorded with corresponding odors if observed.

A.2.1.4. Soil Analytical Approach

The soil samples collected to meet the objectives of the RI will be analyzed for the soil COPCs, which consist of the following:

- Gasoline-range petroleum hydrocarbons by NWTPH-Gx
- Total diesel-range extended petroleum hydrocarbons (TPH-D+O) by NWTPH-Dx
- Semivolatile organic compounds, including polycyclic aromatic hydrocarbons (PAHs) and pentachlorophenol, by EPA 8270D, with low-level carcinogenic PAH (cPAH) analysis by EPA 8270D-SIM
- Metals by EPA 200.8/6020A
- Polychlorinated biphenyls by EPA Method 8082
- VOCs by EPA Method 8260C

The soil analytical approach will generally consist of the following:

At least one sample of fill and native soil will be collected from each exploration, including test pits, soil borings, and monitoring wells, unless specified otherwise in Section 7.4. Soil samples will be collected for laboratory analysis from intervals where field screening suggests the presence of contaminants. If there are no field screening results to suggest the presence of contaminants in fill or native soil, soil samples will be collected from discrete intervals that are determined in the field to be representative of the material warranting data to meet the objectives of the RI. For example:

- If fill consists of reworked native soil or fill soil with no debris, soil samples will be collected from the approximate mid-point of the reworked native/fill soil and approximately 1-foot below the fill-native contact.
- If fill consists of mixed fill that includes soil and debris, soil samples will be collected from a depth of approximately 1-foot beneath the debris horizon and 1-foot below the fill-native contact.
- If fill contains woody debris and/or other debris that sits directly on native soil, soil samples will be collected approximately 1-foot above and 1-foot below the fill-native contact.

A.2.1.5. Soil Sample Identification

Each soil sample collected during the RI will be assigned a unique sample identification number. Soil explorations that are not completed as monitoring wells will consist of either ‘AB’ for Aspect boring or “TP” for test pit, followed by a sequential sample number. The borings advanced for the construction and installation of monitoring wells will be identified with a sequential well identification number, beginning with MW-12. Soil samples collected from borings will be assigned a unique sample identification number including the boring number (AB-X, TP-X, or MW-X) and the depth from which the sample was collected. For example, the soil sample collected from boring AB-20 at a depth of 7 to 8 feet bgs would be identified as AB20-7-8. Soil samples collected from test pits, where multiple samples may be collected from the same depth interval, will be given a sequential letter identifier. For example, the second soil sample collected from test pit TP-7 at a depth of 7 to 8 feet bgs would be identified as TP7b-7-8.

A.2.2. Monitoring Well Installation and Development

Monitoring wells will be constructed by a state-licensed, resource protection well driller and in accordance with Chapter 173-160 WAC. All monitoring wells will be constructed with 2-inch-diameter threaded Schedule 40 PVC slotted screen and blank casing. Well screens will be 0.010-inch (10 slot) slotted screen. An artificial filter pack consisting of 10/20 silica sand will be placed around the well screen, and an annular seal consisting of bentonite chips will be placed above the filter pack. A concrete surface seal will be set at grade for each new monitoring well. The finished monitoring wells will be protected with a steel flush-mount monument, or steel above-ground monument, embedded in the concrete surface seal.

An Aspect field geologist will oversee and document installation of each monitoring well, including completion of an As-Built Well Completion Diagram. Well casing diameter, screen length and total depth are dependent on the purpose of the well and the lithology observed during the investigation activities. The general design and construction of the wells will follow Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers, ASTM Standard D5092 (ASTM, 2010), and Minimum Standards for Construction and Maintenance of Wells, Chapter 173-160 WAC (WAC, 2008).

Following installation, each new monitoring well will be developed to remove fine-grained material from inside the well casing and filter pack to the extent practical, and to improve hydraulic communication between the well screen and the surrounding water-bearing formation. Depth to water will be measured at start and end of development. The wells will be developed using an inertial pump and surge block by performing surge and pump cycles until the water is substantially clear. Surging over the length of the screened interval will be performed for a set period or a minimum of 10 surges. The well will then be pumped until the water clears significantly. These surge and pump cycles will be repeated until the water is substantially clear shortly after the start of pumping or until a maximum of 15 casing volumes of water has been removed

A.2.3. Groundwater Monitoring and Sampling

An initial round of groundwater monitoring and sampling will be conducted at the existing monitoring wells on the Subject Property. Prior to sampling, depth-to-groundwater measurements will be taken in each of the 11 existing monitoring wells (MW-1 through MW-11) using an electric well sounder, graduated to 0.01 foot. Groundwater samples will be collected and handled in accordance with the procedures described below:

- The locking well cap will be removed, and the well will be allowed to equilibrate with the atmospheric pressure for a minimum of 15 minutes prior to measuring the depth to groundwater.
- The depth-to-groundwater will be measured from the surveyed location on the top of the monitoring well casing to the nearest 0.01 foot using an electronic water

level meter. The depth to the bottom of the monitoring well will also be measured to evaluate siltation of the monitoring well. The water level indicator will be decontaminated between each monitoring well.

- Each monitoring well will be purged at a flow rate between 0.1 and 0.5 liters per minute (Puls and Barcelona, 1996) using a peristaltic pump and dedicated low-density polyethylene (LDPE) tubing. The tubing intake will be placed approximately at the center of the saturated section of well screen.
- During purging, field parameters [temperature, pH, specific conductance, oxidation-reduction potential (ORP), turbidity, and dissolved oxygen (DO)] will be monitored using a water quality meter and flow-through cell, or equivalent. These field parameters will be recorded at 3- to 5-minute intervals throughout well purging until they stabilize. The flow rate of the pump must be able to “turn over” at least one flow-through-cell volume between field parameter measurements. The field parameters are considered stable once three consecutive readings are within ± 3% for temperature, ± 0.1 for pH, ± 3% for specific conductance, ± 10 millivolt (mV) for ORP, ± 10% for turbidity [or three consecutive measurements less than 5 Nephelometric Turbidity Units (NTU)], and ± 10 % for DO [or three consecutive measurements below 0.5 milligrams per liter (mg/L)]. Well stabilization has been achieved once all six parameters are stable for three successive readings. However, no more than three well-casing volumes will be purged prior to groundwater sample collection.
- Samples with a field-measured specific electrical conductance greater than 1,000 microsiemens per centimeter (µS/cm) or turbidity greater than 25 NTU will be denoted as such on the chain-of-custody (COC) form, so that the laboratory can employ appropriate sample preparation techniques to avoid analytical interferences for specific analyses, if appropriate (refer to Sections A3.3.2 and A3.3.3).
- If the monitoring well is completely dewatered during purging, samples will be collected when sufficient recharge has occurred to allow filling of all sample containers.
- Once purging is complete, the groundwater samples will be collected directly into laboratory-supplied containers using the same low-flow rate. Samples for dissolved metals analyses will be filtered using an inline 0.45-micrometer (µm) filter; at least 0.5 liter of water will be purged through the filter prior to sample collection.
- Quality control groundwater samples (e.g., field duplicates and trip blanks) will be collected at the respective frequencies prescribed in Section A3.4.1.
- Following sampling, the wells cap and monuments will be secured. Any damaged or defective well caps or monuments will be noted and scheduled for replacement, if necessary.

A.2.3.1. Groundwater Analytical Approach

Groundwater samples collected during the initial groundwater monitoring and sampling event will be submitted for laboratory analysis of the groundwater constituents of potential concern (COPCs) for the RI, consisting of:

- Gasoline-range petroleum hydrocarbons by NWTPH-Gx
- Total diesel-range extended petroleum hydrocarbons (TPH-D+O) by NWTPH-Dx, both with and without silica gel cleanup
- Semivolatile organic compounds, including polycyclic aromatic hydrocarbons (PAHs) and pentachlorophenol, by EPA 8270D, with low-level carcinogenic PAH (cPAH) analysis by EPA 8270D-SIM
- Total and dissolved metals by EPA 200.8/6020A
- Polychlorinated biphenyls by EPA Method 8082
- Volatile organic compounds (VOCs) by EPA Method 8260C
-

Other constituent and geochemical indicator parameters for groundwater, consisting of:

- Extractable and volatile petroleum hydrocarbons (EPH/VPH) by NW-EPH/VPH
- Total and dissolved organic carbon by EPA 9060/SM5310B
- Nitrate and sulfate by EPA 300.0
- Methane by RSK-175
- Alkalinity by SM 2320B

The RI will include at least four consecutive quarters of groundwater monitoring and sampling at all Subject Property monitoring wells. The groundwater analytical approach for subsequent sampling events will be determined based on the results of the first groundwater sampling event to be completed after the new monitoring wells are installed. The scope and frequency of subsequent groundwater monitoring will be determined in consultation with Ecology.

A.2.3.2. Groundwater Sample Identification

Each sample collected during a groundwater monitoring and sampling event will be assigned a unique sample identification number. The sample identification number will include the well number and the date the sample was collected in YYYY-MM-DD format. For example, a groundwater sample collected from monitoring well MW-1 collected on May 1, 2023, will be labeled as MW-1-2023-05-01. Sample identification labels will be filled out and affixed to appropriate laboratory-supplied containers immediately before sample collection. The labels will be filled out in indelible ink and will include the date, time sampled, sample identification number, project name, project number, sampler’s initials, and analyte preservative(s) if any.

A.2.4. Methane Investigation

An evaluation for methane will be conducted using three existing groundwater monitoring wells on the Subject Property and four new gas monitoring probes. The methane investigation will occur concurrently with the initial groundwater monitoring and sampling events. Installation and monitoring details are described in the following sections.

A.2.4.1. Modification of Existing Monitoring Wells

Well caps with gas monitoring ports are required for gas sampling from existing monitoring wells with standard construction details. The well caps will be fabricated from a 2-inch PVC slip cap with a threaded hole drilled in the top for attachment of a valved barb. The gas sampling well caps must be installed at least 1 week prior to baseline sampling to allow sufficient time for equilibrium.

A.2.4.2. Gas Monitoring Probe Installation

Like the soil investigation, the gas probes will be installed using a combination of direct-push and/or either sonic or hollow-stem auger drilling methods, depending on what the driller deems appropriate. Soil samples will be collected continuously from the ground surface to the total depth of each boring for observation, lithologic description, and field screening (see section A.2.1.3 for detailed procedures).

Soil samples and cuttings will be field-screened for the presence of volatile organic vapors using a PID). The PID is designed to detect and measure VOC vapors in air, but it does not detect methane. The VOC concentrations will be used to monitor worker health and safety during drilling, and to indicate if VOCs appear to be present in the soil encountered during drilling (measurements will indicate a potential for contamination that may be investigated further). Aspect personnel will be equipped with personal breathing space monitors (aka 4-gas meters) capable of measuring ambient oxygen, carbon monoxide, and combustible gases (methane, measured as lower explosive limit [LEL]). A portable gas meter (Landtec GEM series 5000 or equivalent) will be used to monitor concentrations of methane, carbon dioxide, oxygen, and hydrogen sulfide at the bore hole and within the work zone. Methane, carbon dioxide, oxygen, and hydrogen sulfide measurements will be taken from the top of the drill casing after each sample run, and periodic ambient air measurements will be recorded as part of Health and Safety monitoring.

In the case of elevated levels of methane or hydrogen sulfide, drilling will cease and a brush fan, provided by the drilling contractor, will be used to clear the immediate area of dangerous gases. Drilling will resume after mitigation plans approved by Aspect's Health and Safety officer are put into place to ensure safe drilling operations.

Pertinent geologic and hydrogeologic subsurface conditions, PID, methane, carbon dioxide, oxygen, and hydrogen sulfide readings will be recorded on field forms (Attachment A). Field calibration of equipment will be recorded in field notes and retained along with any vendor calibration record

Following drilling, each gas monitoring probe will be constructed with a 3/4-inch diameter Schedule 40 PVC casing, a pre-fabricated PVC screen with 0.010-inch continuous slots (CSS), and a sand filter pack. The top of the screened interval will be installed above the seasonal high groundwater level as indicated by the lithology during drilling. Once the casing is set, the boring will be backfilled with sand to 3 feet above the top of the screened interval to form the filter pack for the monitoring probe. A minimum 3-foot well seal will be installed above the filter pack using hydrated bentonite chips.

To allow for monitoring, each probe will be fitted with a valved barb or quick connect fitting supplied and installed by Aspect upon completion of the probe. The valve will be closed to prevent unintended discharge of subsurface vapors to the atmosphere. Aspect is prepared to install either flush mount or above ground protective monuments based on constraints identified during a pre-installation site visit to mark the drilling locations. If the probe is completed below ground, a 10-inch steel, flush-mount monument will be installed in the concrete surface seal. Alternatively, if the probe is completed above ground, a 4-inch schedule 80 PVC protective casing will be installed. The driller will install bollards as specified by WAC 173-160 for the above ground completion.

Following drilling, the ground surface and top of casing elevations will be surveyed for each of the completed monitoring probes. The survey data will be used to prepare updated site figures showing the as-constructed locations for each of the probes.

A.2.4.3. Methane Monitoring

Each gas monitoring event will be scheduled to evaluate conditions during falling barometric pressure. Baseline monitoring will be conducted at each new monitoring probe at the time of completion. During baseline monitoring, methane, carbon dioxide, and oxygen concentrations, static probe pressure, and barometric pressure will be measured at each point using a portable gas meter. The probe casing will be purged with the portable gas meter until concentrations stabilize or until a minimum of three casing volumes have been purged prior to recording. An intrinsically safe SKC pump can be used in addition to the portable gas meter to achieve higher purge rates for the existing monitoring wells, which are 2-inch-diameter and have a larger casing volume. Final measurements will be recorded on a Gas Monitoring Record field sheet (Appendix X), using the data recording features of the portable LFG monitor. Results of baseline monitoring will be reported with results of routine monitoring.

A.2.5. Wetland Sampling

A.2.5.1. Sediment Sampling

Wetland sediments will be collected from 12 sample stations. At each station, hand tools will be used to remove sediment from the ground surface to a total depth of 8 inches below ground surface. Discrete sediment samples will be collected from 0 to 4-inches and 4- to 8-inches from each location. The preliminary wetland sediment sample stations are depicted on Figure 2.

The sediment samples will be submitted for laboratory analysis of the sediment COPCs, in addition to analysis of total solids, total organic carbon, and grain size.

Sediment samples will be assigned a unique sample identification number that consists of a prefix of ‘SED,’ the wetland identification, a sequential sample location number, and the six-digit date on which the sample was collected. For example, the second sediment sample collected from wetland B on March 17, 2023, would be labeled as: SED-B-02-20230317.

A.2.5.2. Surface Water Sampling

Surface water samples will be collected from the Subject Property wetlands A through D. An Aspect field representative will collect two surface water grab samples using direct fill sampling techniques. Where feasible, samples will be collected at least 6 inches below the surface of the water using a discrete interval sampler. The discrete interval sampler will be cleaned between samples by rinsing with distilled water. Surface water samples will be submitted for laboratory analysis of the surface water COPCs.

Surface water samples will be assigned a unique sample identification number that consists of a prefix of ‘SW’, the wetland identification, and the six-digit date on which the sample was collected. For example, the surface water sample collected from wetland B on March 17, 2023 would be labeled as: SW-B-20230317.

A.2.6. Sample Custody and Field Documentation

A.2.6.1. Sample Custody

Upon collection, soil, groundwater and sediment samples will be placed upright in a cooler. Ice or blue ice will be placed in each cooler to meet sample preservation requirements. Inert cushioning material will be placed in the remaining space surrounding the sample containers, as needed, to limit movement during shipping. If the sample coolers/containers are being shipped, not hand delivered, to the laboratory, the COC form will be placed in a waterproof bag taped to the inside lid of the cooler/container for shipment.

After collection, samples will be maintained in Aspect’s custody until formally transferred to the analytical laboratory. For purposes of this work, custody of the samples will be defined as follows:

- In plain view of the field representatives
- Inside a cooler that is in plain view of the field representative, or
- Inside any locked space such as a cooler, locker, car, or truck to which the field representative has the only immediately available key(s)

A COC record provided by the laboratory will be initiated at the time of sampling for all samples collected. The record will be signed by the field representative and others who subsequently take custody of the sample. Couriers or other professional shipping representatives are not required to sign the COC form; however, shipping receipts will be collected and maintained as a part of custody documentation in project files. A copy of the COC form with appropriate signatures will be kept by Aspect’s project manager.

Upon sample receipt, the laboratory will fill out a cooler receipt form to document sample delivery conditions. A designated sample custodian will accept custody of the shipped samples and will verify that the COC form matches the samples received. The laboratory will notify the Aspect project manager, as soon as possible, of any issues noted with the sample shipment or custody.

A.2.6.2. Field Documentation

While conducting field work, the field representative will document pertinent observations and events, specific to each activity, on field forms (e.g., boring log form, as-built well completion form, well development form, groundwater sampling form, etc.) and/or in a field notebook, and, when warranted, provide photographic documentation of specific sampling efforts. Field notes will include a description of the field activity, sample descriptions, and associated details such as the date, time, and field conditions.

A.2.6.3. Location Positioning

The horizontal coordinates and elevations of any new monitoring wells will be surveyed by a licensed surveyor relative to Washington State Plane coordinates (horizontal) and NAVD88 (vertical). Monitoring well top-of-casing and ground surface elevations will be surveyed to the nearest 0.01 foot, and horizontal coordinates to the nearest 0.1 foot, or better. Each well will be surveyed at the marked spot on the top of the PVC well casing from which depth-to-water measurements are collected.

A.3. Quality Assurance Project Plan

This QAPP identifies quality assurance and quality control (QA/QC) procedures and criteria required to ensure that data collected during the RI are of known quality and are acceptable to achieve project objectives. Specific protocols and criteria are also set forth in this QAPP for data quality evaluation, upon the completion of data collection, to determine the level of completeness and usability of the data. It is the responsibility of the project personnel performing or overseeing the sampling and analysis activities to adhere to the requirements of the QAPP.

A.3.1. Purpose of the QAPP

As stated in Ecology Guidelines for Preparation of Quality Assurance Project Plans for Environmental Studies (Ecology Publication No. 04-03-030, December 2016), specific goals of this QAPP are as follows:

- Focus project manager and project team to factors affecting data quality during the planning stage of the project
- Facilitate communication among field, laboratory, and management staff as the project progresses
- Document the planning, implementation, and assessment procedures for QA/QC activities for the investigation
- Ensure that the DQOs are achieved
- Provide a record of the project to facilitate final report preparation

The DQOs for the project include both qualitative and quantitative objectives, which define the appropriate type of data, and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support the environmental assessment. To ensure that the DQOs are achieved, this QAPP details aspects of data collection, including analytical methods, QA/QC procedures, and data quality reviews. This QAPP describes both quantitative and qualitative measures of data to ensure that the DQOs are achieved. DQOs dictate data collection rationale, sampling and analysis designs that are presented in the main body of the RI Work Plan, and sample collection procedures that are presented in the FSP (Section A.2 of this Appendix).

A.3.2. Analytical Methods and Reporting Limits

Analytical methodologies applied to the analyses of samples collected during the RI are in accordance with the following documents:

- EPA SW Methods: EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition, December 1996.
- Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 20th Edition, 1995.
- Ecology Analytical Methods for Petroleum Hydrocarbons. Publication No. ECY 97-602, June 1997.

Table A-1 lists the laboratory analytical methods for soil, groundwater, surface water, and sediment analyses to be performed during the RI, along with samples containers, preservation, and analytical holding times for each analysis.

A.3.2.1. Detection Limit and Method

The detection limit (DL) is the minimum concentration of a compound that can be measured and reported with a 99 percent confidence that the analyte concentration is greater than zero. DLs are established by the laboratory using prepared samples, not samples of environmental media.

The level of quantitation (LOQ) is defined as the lowest concentration at which a chemical can be accurately and reproducibly quantified, within specified limits of precision and accuracy, for a given environmental sample. The LOQ can vary from sample to sample depending on sample size, sample dilution, matrix interferences, moisture content, and other sample-specific conditions. As a minimum requirement for organic analyses, the LOQ should be equivalent to or greater than the concentration of the lowest calibration standard in the initial calibration curve. The expected DLs and LOQs are summarized in Tables A-2 and A-3 for soil/sediment and water samples, respectively.

A.3.3. Data Quality Objectives

DQOs, including the Measurement Quality Indicators (MQIs)—precision, accuracy, representativeness, comparability, completeness, and sensitivity—and sample-specific LOQs are dictated by the data quality objectives, project requirements, and intended uses of the data. For this project, the analytical data must be of sufficient technical quality to determine whether contaminants are present and, if present, whether their concentrations are greater than or less than applicable screening criteria based on protection of human health and the environment.

The quality of data generated through this RI will be assessed against the MQIs set forth in this QAPP. Specific QC parameters associated with each of the MQIs are summarized in Table A-4. Specific MQI goals and evaluation criteria (i.e., DLs, LOQs, percent recovery (%R) for accuracy measurements, relative percent difference (RPD) for precision measurements, are defined in Tables A-2 and A-3. Definitions of these parameters and the applicable QC procedures are presented below.

A.3.3.1. Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared with their average values. Analytical precision is measured through matrix spike/matrix spike duplicate (MS/MSD) samples and laboratory control samples/laboratory control sample duplicate (LCS/LCSD) for organic analysis and through laboratory duplicate samples for inorganic analyses.

Analytical precision is quantitatively expressed as the RPD between the LCS/LCSD, MS/MSD, or laboratory duplicate pairs and is calculated with the following formula:

$$RPD\,(\%) = 100 \times \frac{|S - D|}{(S + D)/2}$$

where:
S = analyte concentration in sample
D = analyte concentration in duplicate sample

Analytical precision measurements will be carried out at a minimum frequency of 1 per 20 samples for each matrix sampled, or 1 per laboratory analysis group. Laboratory precision will be evaluated against laboratory quantitative RPD performance criteria as defined in Tables A-2 and A-3 for specific analytical methods and sample matrices. If the control criteria are not met, the laboratory will supply a justification of why the limits were exceeded and implement the appropriate corrective actions. The RPD will be evaluated during data review and validation. The data reviewer will note deviations from the specified limits and will comment on the effect of the deviations on reported data.

A.3.3.2. Accuracy

Accuracy measures the closeness of the measured value to the true value. The accuracy of chemical test results is assessed by “spiking” samples with known standards (surrogates, blank spikes, or matrix spikes) and establishing the average recovery. Accuracy is quantified as the %R. The closer the %R is to 100 percent, the more accurate the data.

Surrogate recovery will be calculated as follows:

$$\text{Recovery}(\%) = \frac{MC}{SC} \times 100$$

where:

SC = spiked concentration
MC = measured concentration

MS percent recovery will be calculated as follows:

$$\text{Recovery}(\%) = \frac{MC - USC}{SC} \times 100$$

where:

SC = spiked concentration
MC = measured concentration
USC = unspiked sample concentration

Accuracy measurements on MS samples will be carried out at a minimum frequency of 1 in 20 samples per matrix analyzed. Blank spikes will also be analyzed at a minimum frequency of 1 in 20 samples (not including QC samples) per matrix analyzed. Surrogate recoveries for organic compounds will be determined for each sample analyzed for respective compounds. Laboratory accuracy will be evaluated against the performance criteria defined in Table A-2 and A-3. If the control criteria are not met, the laboratory will supply a justification of why the limits were exceeded and implement the appropriate corrective actions. Percent recoveries will be evaluated during data review and validation, and the data reviewer will comment on the effect of the deviations on the reported data.

A.3.3.3. Representativeness

Representativeness measures how closely the measured results reflect the actual concentration or distribution of the chemical compounds in the matrix sampled. The SAP sampling techniques and sample handling protocols (e.g., homogenizing, storage, preservation, and use of duplicates and blanks) have been developed to ensure representative samples. Only representative data will be used in the RI. The RI objectives and approach for sampling is described in Section 7 of the RI Work Plan. The RI field sampling procedures are described in the SAP (Section A.2) of this appendix.

The representativeness of a data point is determined by assessing the integrity of the sample upon receipt at the laboratory (e.g., consistency of sample ID and collection date/time between container labels vs. COC forms, breakage/leakage, cooler temperature, preservation, headspace for VOA containers, etc.); compliance of method required sample preparation, and analysis holding times; the conditions of blanks (trip blank, rinsate blank, field blank, method/preparation blank, and calibration blank) associated with the sample; and the overall consistency of the results within a field duplicate pair.

A.3.3.4. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This goal will be achieved using standard techniques to collect samples, EPA-approved standard methods to analyze samples, and consistent units to report analytical results. Data comparability also depends on data quality. Data of unknown quality cannot be compared.

A.3.3.5. Completeness

Completeness is defined as the percentage of measurements made that are judged to be valid. Results will be considered valid if the precision, accuracy, and representativeness objectives are met, and if RLs are sufficient for the intended uses of the data. Completeness is calculated as follows:

$$Completeness\ (\%) = \frac{V}{P} \times 100$$

where:

V = number of valid measurements
P = number of measurements taken

Valid and invalid data (i.e., data qualified with the R flag [rejected]) will be identified during data validation. The target completeness goal for this project is 95 percent.

A.3.3.6. Sensitivity

Sensitivity depicts the level of ability an analytical system (i.e., sample preparation and instrumental analysis) of detecting a target component in a given sample matrix with a defined level of confidence. Factors affecting the sensitivity of an analytical system include: analytical system background (e.g., laboratory artifact or method blank contamination), sample matrix (e.g., mass spectrometry ion ratio change, coelution of peaks, or baseline elevation), and instrument instability.

A.3.4. Quality Control Procedures

Field and laboratory QC procedures are outlined below.

A.3.4.1. Field Quality Control

Beyond use of standard sampling protocols defined in the SAP, field QC procedures include maintaining the field instrumentation used. Field instruments (e.g., PID for evaluating presence of VOCs in soil samples, multi-gas meter for methane gas monitoring, and the YSI multimeter for measuring field parameters during groundwater sampling) are maintained and calibrated regularly prior to use, in accordance with manufacturer recommendations.

In addition, field QC samples will be collected and submitted for analyses to monitor the precision and accuracy associated with field procedures. Field QC samples to be collected and analyzed for this RI include field duplicates, trip blanks, and equipment rinsate blanks. The definition and sampling requirements for field QC samples are presented below.

A.3.4.1.1. Blind Field Duplicates

Blind field duplicate samples are used to check for sampling and analysis reproducibility; however, the field duplicate sample results include variability introduced during both field sampling and laboratory preparation and analysis, and EPA data validation guidance provides no specific evaluation criteria for field duplicate samples. Advisory evaluation criteria are set forth at 35 percent for RPD (if both results are greater than five times the RL) and two times the LOQs for concentration difference (if either of the result is less than five times the LOQ) between the original and field duplicate results.

Field duplicates will be submitted "blind" to the laboratory as discrete samples (i.e., given unique sample identifiers to keep the duplicate identity unknown to the laboratory), but will be clearly identified in the field log. Field duplicate samples will be collected at a frequency of 5 percent (1 per 20) of the field samples for each matrix and analytical method, but not less than one duplicate per sampling event per matrix.

If a given soil sample depth interval lacks sufficient volume (recovery) to supply material for a planned analysis and its field duplicate analysis, the field duplicate aliquot will be collected for that analysis from another depth interval in that same location if practical.

A.3.4.1.2. Trip Blank

Trip blank samples will be used to monitor possible VOC cross contamination occurring during sample transport. Trip blank samples are prepared and supplied by the laboratory using organic-free reagent-grade water into a VOC vial prior to the collection of field samples. The trip blank sample vials are placed with and accompany the VOC samples through the entire transporting process. One trip blank will be collected for each soil sampling round and each groundwater sampling round, where VOC analyses are conducted.

In case a target compound is present in a trip blank, results for all samples shipped with this trip blank will be evaluated and data qualified accordingly if determined that the results are affected.

A.3.4.1.3. Equipment Rinsate Blank

Equipment rinsate blanks are collected to determine the potential of cross-contamination introduced by soil sampling equipment that is used between samples. Groundwater sampling is conducted using dedicated equipment; therefore, rinsate blanks are not needed for groundwater sampling QC. The deionized water used for soil sampling equipment decontamination is rinsed through the decontaminated sampling equipment and collected into adequate sample containers for analysis of the preliminary COPCs. The blank is then processed, analyzed, and reported as a regular field sample. **One rinsate blank will be conducted for each round of soil sampling.** The rinsate blank sampled will be labeled with a "RB-" prefix and the date it is collected (e.g., RB-20220501).

A.3.4.2. Laboratory Quality Control

The laboratories' analytical procedures must meet requirements specified in the respective analytical methods or approved laboratory standard operating procedures (SOPs), e.g., instrument performance check, initial calibration, calibration check, blanks, surrogate spikes, internal standards, and/or labeled compound spikes. Specific laboratory QC analyses required for this project will consist of the following at a minimum:

- Instrument tuning, instrument initial calibration, and calibration verification analyses as required in the analytical methods and the laboratory standard operating procedures (SOPs).
- Laboratory and/or instrument method blank measurements at a minimum frequency of 5 percent (1 per 20 samples) or in accordance with method requirements, whichever is more frequent.
- Accuracy and precision measurements at a minimum frequency of 5 percent (1 per 20 samples) or in accordance with method requirements, whichever is more frequent. In cases where a pair of MS/MSD or MS/laboratory duplicate analyses are not performed on a project sample, a set of LCS/LCSD analyses will be performed to provide sufficient measures for analytical precision and accuracy evaluation.

The laboratory's QA officers are responsible for ensuring that the laboratory implements the internal QC and QA procedures detailed in their Quality Assurance Manual.

A.3.5. Corrective Actions

If routine QC audits by the laboratory result in detection of unacceptable conditions or data, actions specified in the laboratory SOPs will be taken. Specific corrective actions are outlined in each SOP used and can include the following:

- Identifying the source of the violation
- Reanalyzing samples if holding-time criteria permit
- Resampling and analyzing
- Evaluating and amending sampling and analytical procedures
- Accepting, but qualifying data to indicate the level of uncertainty

If unacceptable conditions occur, the laboratory will contact Aspect's project manager to discuss the issues and determine the appropriate corrective action. Corrective actions taken by the laboratory during analysis of samples for this project will be documented by the laboratory in the case narrative associated with the affected samples.

In addition, the project data quality manager will review the laboratory data generated for this investigation to ensure that project DQOs are met. If the review indicates that non-conformances in the data have resulted from field sampling or documentation procedures or laboratory analytical or documentation procedures, the impact of those nonconformances on the overall project data usability will be assessed. Appropriate actions, including resampling and/or reanalysis of samples may be recommended to the project manager to achieve project objectives.

A.3.6. Data Reduction, Quality Review, and Reporting

All data will undergo a QA/QC evaluation at the laboratory, which will then be reviewed by the Aspect database manager and the project data quality manager. Initial data reduction, evaluation, and reporting at the laboratory will be carried out in full compliance with the method requirement and laboratory SOPs. The laboratory internal review will include verification (for correctness and completeness) of electronic data deliverable (EDD) accompanied with each laboratory report. The Aspect database manager will verify the completeness and correctness of all laboratory deliverables (i.e., laboratory report and EDDs) before releasing the deliverables for data validation.

A.3.6.1. Minimum Data Reporting Requirements

The following sections specify general and specific requirements for analytical data reporting to provide sufficient deliverables for project documentation and data quality assessment.

General Requirements

The following requirements apply to laboratory reports for all types of analyses:

- A laboratory report will include a cover page signed by the laboratory director, the laboratory QA officer, or his/her designee to certify the eligibility of the reported contents and the conformance with applicable analytical methodology.
- Definitions of abbreviations, data flags, and data qualifiers used in the report.
- Cross reference of field sample names and laboratory sample identity for all samples in the sample delivery group (SDG).
- Completed COC document signed and dated by parties of acquiring and receiving.
- Completed sample receipt document with record of cooler temperature and sample conditions upon receipt at the laboratory. Anomalies such as inadequate sample preservation, inconsistent bottle counts, and sample container breakage, and communication record and corrective actions in response to the anomalies will be documented and incorporated in the sample receipt document. The document will be initialed and dated by personnel that complete the document.
- Case narrative that addresses any anomalies or QC outliers in relation to sample receiving, sample preparation, and sample analysis on samples in the SDG. The narrative will be presented separately for each analytical method and each sample matrix.
- All pages in the report are to be paginated. Any insertion of pages after the laboratory report is issued will be paginated with starting page number suffixed with letters (e.g., pages inserted between pages 134 and 135 should be paginated as 134A, 134B, etc.)
- Any resubmitted or revised report pages will be submitted to Aspect with a cover page stating the reason(s) and scope of resubmission or revision, and signed by laboratory director, QA officer, or the designee.

Specific Requirements

The following presents specific requirements for laboratory reports:

- Sample results: Sample results will be evaluated and reported down to the DLs. Detections at levels greater than the DLs, but less than the LOQs, will be reported and flagged with “J.” Results less than the DLs will be reported at the LOQs and flagged with “U.” All soil sample results will be reported on a dry-weight basis. The report pages for sample results (namely Form 1s) will, at minimum, include sample results, LOQs, unit, proper data flags, dates of sample collection, preparation, and analysis, dilution factor, percent moisture (for solid samples), and sample volume (used for analysis).
- Instrument run log: The run log will list, in chronological order, all analytical runs on field samples, QC samples, calibrations, and calibration verification analyses in the SDG with data file name (and/or legible laboratory codes) and analysis date/time for each analytical run.
- Original sample preparation and analyst worksheet: Initialed and dated by analyst and reviewer.
- GC/MS and inductively coupled plasma (ICP)/MS tune report: Including ion abundance ratios and criteria for all required ions.
- Initial calibration summary: Including data file name for each calibration standard file; response factor (RF) or calibration factor (CF) for each calibration standard and each target and surrogate compound; average RF or CF, percent relative standard deviation (%RSD), correlation coefficient, or coefficient of determination; and absolute and relative retention times and ion ratios for HRGC/HRMS methods for each target compound and surrogate (labeled) compounds. As applicable and if required by the methods, initial calibrations should be verified with a second-source standard (namely the initial calibration verification [ICV]) at the mid-point concentration of the initial calibration. ICV results should be reported as part of the initial calibration.
- Calibration verification summary: Including true amount, calculated amount, and percent difference (%D), or percent drift (%D_f) as applicable, for target compounds.
- Method blank and calibration blank (as applicable such as metals analyses) results.
- LCS and LCSD (if matrix spike duplicate analysis is not performed) results with laboratory acceptance criteria for %R and RPD.
- Surrogate spike results with laboratory acceptance criteria for %R.
- MS and MSD results with laboratory acceptance criteria for %R and RPD. In cases where MS/MSD analyses were not performed on a project sample, LCS/LCSD analyses should be performed and reported instead.
- Internal standard (as applicable) results: Internal standard absolute retention times and response areas in field samples, QC analyses, and associated calibration verification analyses.

- Labeled compound (HRGC/HRMS methodology only) results, ion abundance ratios, and recovery.

A.3.7. Data Quality Verification and Validation

Reported analytical results will be qualified by the laboratory to identify QC concerns in accordance with the specifications of the analytical methods. Additional laboratory data qualifiers may be defined and reported by the laboratory to more completely explain QC concerns regarding a particular sample result. All data qualifiers will be defined in the laboratory's narrative reports associated with each case.

A Level 2b data validation will be performed on the data collected as described in the RI Work Plan. In cases where a systematic QC problem is suspected, such as unusual detections of an analyte or consistent outlying results of a QC parameter, a more detailed review, including a Level 4 validation, will be performed on laboratory records pertinent to the concerned analysis to further evaluate the extent of the QC issue and the final data quality and usability. The actual level of validation for each data point will be entered in the electrical database submitted to the Ecology Environmental Information Management system (EIMs). Data validation will be conducted following the guidance below:

- EPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, January 2010, EPA 540/R-10/011.
- EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, June 2008, EPA-540-R-08-01.

The data validation will examine and verify the following parameters against the method requirements and laboratory control limits specified in Tables A-2 and A-3:

- Sample management and holding times
- Instrument performance check, calibration, and calibration verification
- Laboratory and field blank results
- Detection and reporting limits
- Laboratory replicate results
- MS/MSD results
- LCS and/or standard reference material results
- Field duplicate results
- Surrogate spike recovery (organic analyses only)
- Internal standard recovery (internal calibration methods only)
- Inter-element interference check (ICP analyses only)
- Serial dilution (metals only)

- Labeled compound recovery (isotope dilution methods only)
- Ion ratios for detected compounds (high resolution GC/MS methods only)

Data qualifiers will be assigned based on outcome of the data validation. Data qualifiers are limited to and defined as follows:

- U = The analyte was analyzed for but was determined to be non-detect above the reported sample quantitation limit, or the quantitation limit was raised to the concentration found in the sample due to blank contamination.
- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ = The analyte was not detected above the reported quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
- DNR = Do not report from this analysis; the result for this analyte is to be reported from an alternative analysis.

In cases of multiple analyses (such as an undiluted and a diluted analysis) performed on one sample, the optimal result will be determined and only the determined result will be reported for the sample.

The scope and findings of the data validation will be documented and discussed in the Data Validation Report(s). The Data Validation Report(s) will be appended to the RI report.

A.3.8. Preventative Maintenance Procedures and Schedules

Preventative maintenance in the laboratory will be the responsibility of the laboratory personnel and analysts. This maintenance includes routine care and cleaning of instruments and inspection and monitoring of carrier gases, solvents, and glassware used in analyses. Details of the maintenance procedures are addressed in the respective laboratory SOPs.

Precision and accuracy data are examined for trends and excursions beyond control limits to determine evidence of instrument malfunction. Maintenance will be performed when an instrument begins to change as indicated by the degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet one or another of the method-specific QC criteria.

Maintenance and calibration of instruments used in the field for sampling (e.g., PID for evaluating presence of VOCs in soil samples and the YSI multimeter for measuring field parameters during groundwater sampling) will be conducted regularly in accordance with manufacturer recommendations prior to use.

A.3.9. Performance and System Audits

The Aspect project manager has responsibility for reviewing the performance of the laboratory QA program; this review will be achieved through regular contact with the analytical laboratory's project manager. To ensure comparable data, all samples of a given matrix to be analyzed by each specified analytical method will be processed consistently by the same analytical laboratory.

A.3.10. Data and Records Management

Records will be maintained documenting all activities and data related to field sampling and chemical analyses.

A.3.10.1. Field Documentation

Inspection and monitoring results will be documented on field report forms and/or in field notebooks. Adequate records will be maintained for each sample collected. The field representative will document pertinent observations and events specific to each activity and specific to each sample collected and, when warranted, provide photographic documentation of specific sampling efforts. Field notes will include the following:

- Date, time, weather conditions, project location, and sampler's name
- Sample location, sample type, and sample number
- Description of the field activity
- Sample descriptions and sampling method
- Size, type, and quantity of sample containers
- Field equipment used
- Field parameters

Pertinent observations of the sample condition that are worthy of noting in the field documentation include the following:

- Sample color
- Sedimentation or turbidity
- Oil or sheen
- Separate phase liquids
- Odor
- Effervescence
- Beginning canister vacuum (soil gas samples only)
- Ending canister vacuum (soil gas samples only)

Other information to be included in the field notebook includes the following:

- Reason for sampling
- Problems encountered due to unusual conditions
- Communications with Ecology, City staff, laboratory, or field staff

A.3.10.2. Analytical Data Management

Raw data received from the analytical laboratory will be reviewed, entered into a computerized database, and verified for consistency and correctness. The database will be updated based on data review and independent validation, if necessary.

The following field data will be included in the database:

- Sample location coordinates
- Sample type (i.e., groundwater or soil)
- Soil or groundwater sampling depth interval

Information regarding whether concentrations represent total phase (unfiltered samples) or dissolved phase (filtered samples) will be compiled and stored in the database. Data will be submitted to Ecology's Environmental Information Management (EIM) database once data have been reviewed and validated.

A.4. References for Appendix A

ASTM International, Inc. (ASTM) D2488-09a, 2009, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), ASTM International, West Conshohocken, PA, 2009, www.astm.org.

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US Environmental Protection Agency (EPA), 2008, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, June 2008, EPA-540-R-08-01.

US Environmental Protection Agency (EPA), 2010, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, January 2010, EPA 540/R-10/011.

Washington State Department of Ecology (Ecology) 2016, Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies, Publication No. 04-03-030, December 2016.

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TABLES

Table A-1. Analytical Methods, Sample Containers, Preservation, and Holding Times

Project No. 210507, 2200 Cooper Point Road NW, Olympia, Washington

Sample Matrix	Analytical Parameter	Analytical Method	Sample Container	No. Containers	Preservation Requirements	Holding Time
Soil	Petroleum hydrocarbons, diesel- and oil-range	NWTPH-Dx	8 ounce glass jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Petroleum hydrocarbons, gasoline-range	NWTPH-Gx	8 ounce jar, 3 40-ml VOA vials	4	4°C ±2°C, Freeze within 48 hours to <-7°C	14 days for extraction; 40 days for analysis
	Metals	EPA 200.8/6020A/7471A	4 ounce glass jar	1	4°C ±2°C	6 months, Hg-28 days
	Polychlorinated Biphenyls	EPA 8082	8 ounce glass jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Pentachlorphenol	EPA 8270D	8 ounce glass jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Volatile Organic Compounds	EPA 8260C	Method 5035A, 40-ml VOA vials, 2 ounce jar	5	4°C ±2°C, Freeze within 48 hours to <-7°C, Methanol, Sodium Bisulfate	14 days
	Low-level PAHs	Method 8270D-SIM	8 ounce glass jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
Sediment	Total solids	SM2540G	4 ounce glass jar	1	4°C ±2°C	14 days
	Total organic carbon	PSEP	4 ounce glass jar	1	4°C ±2°C	14 days
	Grain size	PSEP	16 ounce glass or plastic jar	1	4°C ±2°C	none
	Sulfide	PSEP	2 ounce glass jar, no headspace	1	4°C ±2°C	7 days
	Metals	EPA 6020A, 7196A, 7471B	4 ounce glass jar	1	4°C ±2°C	6 months 28 days for Hg
	Semivolatile organic compounds/polychlorinated biphenyls/pesticides	EPA 8270D (with SIM for LL PAHs); EPA 8081	16 ounce glass jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Volatile organic compounds	EPA 8260C	2 ounce glass jar, no headspace	1	4°C ±2°C	14 days
Groundwater/Surface Water	Petroleum hydrocarbons, diesel- and oil-	NWTPH-Dx	500-mL Amber Glass, 40-mL VOA vial	2	4°C ±2°C, HCl	7 days for extraction, 40 days for analysis
	Petroleum hydrocarbons, gasoline-	NWTPH-Gx	40-mL VOA vial	3	4°C ±2°C, HCl	14 days
	Petroleum hydrocarbons, extractable (EPH)	NW-EPH	1-L Amber glass	2	≤6°C, HCl pH<2	14 days for extraction, 40 days for analysis
	Petroleum hydrocarbons, volatile (VPH)	NW-VPH	40-mL VOA vial	3	≤6°C, HCl pH<2	14 days
	Metals, total/dissolved (field filter)	Method 200.7/200.8	500-mL HDPE	1	4°C ±2°C, HNO3 pH < 2 (after filtration)	180 days
	Low-level PAHs	EPA 8270D (w/8270D-SIM for LL PAHs)	500-mL Amber Glass	2	4°C ±2°C	7 days for extraction, 40 days for analysis
	Pentachlorophenol	EPA 8270D	500-mL Amber Glass	2	4°C ±2°C	7 days for extraction, 40 days for analysis
	Polychlorinated biphenyls	EPA 8082	1-L Amber Glass	2	≤6°C	7 days for extraction; 40 days for analysis
	Volatile Organic Compounds	EPA 8260	40-mL VOA Vials	3	4°C ±2°C, 2 with HCl pH < 2, 2 without HCl	14 days for analysis
	Total Organic Carbon	SM5310B/EPA 9060A	205-mL HDPE	1	≤6°C, HCl pH <2	28 days
	Dissolved Organic Carbon	SM5310B	250-mL Amber glass	1	H2SO4 ph<2, ≤6°C, (after filtration)	28 days
	Methane	RSK 175	40-mL VOA vial	3	4°C ±2°C, HCl pH<2	14 days
	Nitrogen as Nitrate	353.2/9056	500-mL HDPE	1	≤6°C	48 hours
	Sulfate	300.0/9056	500-mL HDPE	1	≤6°C	28 days
	Alkalinity	SM 2320B-97	500-mL HDPE	1	≤6°C	14 days

Table A-2. Measurement Quality Objectives for Soil and Sediment Samples

Project No. 210507, 2200 Cooper Point Road NW, Olympia, Washington

Analyte Name	DL(1)	LOQ	LCS/LCS %R(A)	MS/MSD %R(A)	RPD (%)	Surrogate %R(A)
Metals by EPA 200.8/6020A (mg/kg)						
Antimony	0.100	0.200	75 - 125	80 - 120	20	n/a
Arsenic	0.250	0.500	75 - 125	80 - 120	20	n/a
Beryllium	0.100	0.200	75 - 125	80 - 120	20	n/a
Cadmium	0.0500	0.100	75 - 125	80 - 120	20	n/a
Chromium	0.250	0.500	75 - 125	80 - 120	20	n/a
Copper	0.250	0.500	75 - 125	80 - 120	20	n/a
Lead	0.0500	0.100	75 - 125	80 - 120	20	n/a
Nickel	0.250	0.500	75 - 125	80 - 120	20	n/a
Selenium	0.250	0.500	75 - 125	80 - 120	20	n/a
Silver	0.100	0.200	75 - 125	80 - 120	20	n/a
Thallium	0.100	0.200	75 - 125	80 - 120	20	n/a
Zinc	2.00	4.00	75 - 125	80 - 120	20	n/a
Mercury by EPA 7471B (mg/kg)						
Mercury	0.0125	0.025	75 - 125	80 - 120	20	n/a
Volatile Organic Compounds (VOCs) by SW8260C (ug/kg)						
1,1,1,2-Tetrachloroethane	0.233	1.00	80 - 120	80 - 120	30	n/a
1,1,1-Trichloroethane	0.226	1.00	78 - 133	78 - 133	30	n/a
1,1,2,2-Tetrachloroethane	0.253	1.00	71 - 120	71 - 120	30	n/a
1,1,2-Trichloroethane	0.286	1.00	77 - 120	77 - 120	30	n/a
1,1,2-Trichlorotrifluoroethane (Freon 113)	0.287	2.00	72 - 142	72 - 142	30	n/a
1,1-Dichloroethane	0.203	1.00	65 - 139	65 - 139	30	n/a
1,1-Dichloroethene	0.336	1.00	73 - 138	73 - 138	30	n/a
1,2,3-Trichlorobenzene	0.305	5.00	76 - 122	76 - 122	30	n/a
1,2,3-Trichloropropane	0.517	2.00	75 - 120	75 - 120	30	n/a
1,2,4-Trimethylbenzene	0.230	1.00	77 - 125	77 - 125	30	n/a
1,2-Dibromo-3-chloropropane	0.586	5.00	61 - 128	61 - 128	30	n/a
1,2-Dichloroethane	0.191	1.00	77 - 120	77 - 120	30	n/a
1,2-Dichloroethene, cis-	0.240	1.00		75 - 124	30	n/a
1,2-Dichloroethene, trans-	0.266	1.00	73 - 131	73 - 131	30	n/a
1,2-Dichloropropane	0.162	1.00	74 - 120	74 - 120	30	n/a
1,3,5-Trimethylbenzene (Mesitylene)	0.254	1.00	77 - 126	77 - 126	30	n/a
1,3-Dichloropropane	0.209	1.00	77 - 120	77 - 120	30	n/a
1,3-Dichloropropene, cis-	0226	1.00	80 - 124	80 - 124	30	n/a
1,3-Dichloropropene, trans-	0.216	1.00	80 - 126	80 - 126	30	n/a
1,4-Dichloro-2-butene, trans-	0.437	5.00	62 - 127	62 - 127	30	n/a
2-Butanone (MEK)	0.513	5.00	64 - 120	64 - 120	30	n/a
2-Hexanone (Methyl butyl ketone)	0.439	5.00	62 - 128	62 - 128	30	n/a
4-Chlorotoluene	0.277	1.00	75 - 121	75 - 121	30	n/a
4-Isopropyltoluene (4-Cymene)	0.236	1.00	78 - 131	78 - 131	30	n/a
Acetone	0.482	5.00	48 - 132	48 - 132	30	n/a
Acrolein	3.81	50.0	60 - 130	60 - 130	30	n/a
Acrylonitrile	1.03	5.00	59 - 124	59 - 124	30	n/a
Benzene	0.296	1.00	80 - 120	80 - 120	30	n/a
Bromobenzene	0.153	1.00	75 - 120	75 - 120	30	n/a
Bromochloromethane	0.323	1.00	69 - 133	69 - 133	30	n/a
Bromodichloromethane	0.254	1.00	80 - 122	80 - 122	30	n/a
Bromoform (Tribromomethane)	0.297	1.00	63 - 120	63 - 120	30	n/a
Bromomethane (Methyl bromide)	0.187	1.00	40 - 172	40 - 172	30	n/a
Carbon disulfide	0.559	1.00	72 - 146	72 - 146	30	n/a
Carbon tetrachloride (Tetrachloromethane)	0.213	1.00	76 - 136	76 - 136	30	n/a
Chlorobenzene	0.219	1.00	80 - 120	80 - 120	30	n/a
Chloroethane	0.462	1.00	53 - 154	53 - 154	30	n/a
Chloroform	0.234	1.00	75 - 126	75 - 126	30	n/a
Chloromethane	0.263	1.00	65 - 129	65 - 129	30	n/a
Dibromochloromethane	0.266	1.00	77 - 123	77 - 123	30	n/a
Dibromomethane	0.147	1.00	80 - 120	80 - 120	30	n/a
Dichlorodifluoromethane	0.207	1.00	67 - 142	67 - 142	30	n/a
Dichloromethane (Methylene chloride)	0.635	2.00	61 - 128	61 - 128	30	n/a
Ethylbenzene	0.202	1.00	80 - 120	80 - 120	30	n/a
Ethylene dibromide (1,2-Dibromoethane)	0.176	1.00	79 - 120	79 - 120	30	n/a
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	0.410	5.00	72 - 135	72 - 135	30	n/a
Isopropylbenzene (Cumene)	0.233	1.00	77 - 127	77 - 127	30	n/a
Methyl iodide (Iodomethane)	0.215	1.00	34 - 181	34 - 181	30	n/a
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))	0.420	5.00	70 - 124	70 - 124	30	n/a
Methyl tert-butyl ether (MTBE)	0.231	1.00	68 - 124	68 - 124	30	n/a
n-Butylbenzene	0.262	1.00	75 - 134	75 - 134	30	n/a
n-Propylbenzene	0.272	1.00	76 - 126	76 - 126	30	n/a
o-Xylene	0.224	1.00	80 - 120	80 - 120	30	n/a
sec-Butylbenzene	0.240	1.00	77 - 127	77 - 127	30	n/a
Styrene	0.138	1.00	80 - 122	80 - 122	30	n/a
tert-Butylbenzene	0.306	1.00	77 - 125	77 - 125	30	n/a
Tetrachloroethene (PCE)	0.257	1.00	76 - 131	76 - 131	30	n/a
Toluene	0.151	1.00	78 - 120	78 - 120	30	n/a
Trichloroethene (TCE)	0.212	1.00	80 - 120	80 - 120	30	n/a
Trichlorofluoromethane (Fluorotrichloromethane)	0.266	1.00	57 - 161	57 - 161	30	n/a
Vinyl acetate	0.381	5.00	54 - 138	54 - 138	30	n/a
Vinyl chloride	0.235	1.00	74 - 134	74 - 134	30	n/a
1,2-Dichloroethane-d4	n/a	n/a	n/a	n/a	n/a	80 - 149
1,2-Dichlorobenzene-d4	n/a	n/a	n/a	n/a	n/a	80 - 120
Toluene-d8	n/a	n/a	n/a	n/a	n/a	77 - 120
4-Bromofluorobenzene	n/a	n/a	n/a	n/a	n/a	80 - 120
Dibromofluoromethane	n/a	n/a	n/a	n/a	n/a	80 - 120

Table A-2. Measurement Quality Objectives for Soil and Sediment Samples

Project No. 210507, 2200 Cooper Point Road NW, Olympia, Washington

Analyte Name	DL[(1)]	LOQ	LCS/LCS %R[(A)]	MS/MSD %R[(A)]	RPD (%)	Surrogate %R[(A)]
Semivolatile Organic Compounds (SVOCs) by SW8270D (ug/kg)						
1,2,4-Trichlorobenzene	15.9	67.0	50 - 120	50 - 120	30	n/a
1,2-Dichlorobenzene	18.4	67.0	48 - 120	48 - 120	30	n/a
1,3-Dichlorobenzene	15.7	67.0	47 - 120	47 - 120	30	n/a
1,4-Dichlorobenzene	15.6	67.0	46 - 120	46 - 120	30	n/a
1,4-Dioxane	n/a	67.0	n/a	n/a	30	n/a
2,2'-Oxybis (1-chloropropane)	18.7	67.0	36 - 120	36 - 120	30	n/a
2,4,5-Trichlorophenol	150	330	52 - 120	52 - 120	30	n/a
2,4,6-Trichlorophenol	142	330	51 - 120	51 - 120	30	n/a
2,4-Dichlorophenol	74.7	330	51 - 120	51 - 120	30	n/a
2,4-Dimethylphenol	16.2	67.0	40 - 120	40 - 120	30	n/a
2,4-Dinitrophenol	77.3	670	15 - 169	15 - 169	30	n/a
2,4-Dinitrotoluene	96.0	330	57 - 127	57 - 127	30	n/a
2,6-Dinitrotoluene	96.0	330	54 - 124	54 - 124	30	n/a
2-Chloronaphthalene	21.3	67.0	48 - 120	48 - 120	30	n/a
2-Chlorophenol	14.3	67.0	45 - 120	45 - 120	30	n/a
2-Methylphenol (o-Cresol)	23.3	67.0	45 - 120	45 - 120	30	n/a
2-Nitroaniline	120	330	51 - 120	51 - 120	30	n/a
2-Nitrophenol	63.4	67.0	50 - 120	50 - 120	30	n/a
3,3'-Dichlorobenzidine	89.3	330	37 - 140	37 - 140	30	n/a
3-Methylphenol & 4-Methylphenol (m&p-Cresol)	n/a	n/a	n/a	n/a	n/a	n/a
3-Methylphenol (m-Cresol)	n/a	n/a	n/a	n/a	n/a	n/a
3-Nitroaniline	104	330	39 - 142	39 - 142	30	n/a
4-Bromophenyl-phenyl ether	19.3	67.0	50 - 120	50 - 120	30	n/a
4-Chloro-3-methylphenol	115	330	54 - 120	54 - 120	30	n/a
4-Chloroaniline	100	330	17 - 149	17 - 149	30	n/a
4-Methylphenol (p-Cresol)	22.4	67.0	47 - 120	47 - 120	30	n/a
4-Nitroaniline	102	330	47 - 124	47 - 124	30	n/a
4-Nitrophenol	48.2	330	23 - 130	23 - 130	30	n/a
Aniline	21.8	67.0	10 - 129	10 - 129	30	n/a
Benzidine	210	670	57 - 120	57 - 120	30	n/a
Benzoic acid	251	670	10 - 160	10 - 160	30	n/a
Benzyl alcohol	86.7	330	16 - 120	16 - 120	30	n/a
Biphenyl (1,1'-Biphenyl)	1.44	5.00	30 - 160	30 - 160	30	n/a
bis(2-Chloroethoxy)methane	17.3	67.0	49 - 120	49 - 120	30	n/a
bis(2-Chloroethyl)ether	16.9	67.0	43 - 120	43 - 120	30	n/a
bis(2-Ethylhexyl)phthalate	23.9	67.0	63 - 128	63 - 128	30	n/a
Butylbenzyl phthalate	24.6	67.0	44 - 144	44 - 144	30	n/a
Dibenzofuran	18.2	67.0	55 - 120	55 - 120	30	n/a
Diethyl phthalate	20.9	67.0	54 - 120	54 - 120	30	n/a
Dimethyl phthalate	26.5	67.0	56 - 120	56 - 120	30	n/a
Di-n-butyl phthalate	33.1	67.0	60 - 120	60 - 120	30	n/a
Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	122	670	10 - 157	10 - 157	30	n/a
Di-n-octyl phthalate	19.1	67.0	59 - 120	59 - 120	30	n/a
Hexachlorobenzene	18.9	67.0	50 - 121	50 - 121	30	n/a
Hexachlorocyclopentadiene	62.4	330	23 - 149	23 - 149	30	n/a
Hexachloroethane	18.8	67.0	43 - 120	43 - 120	30	n/a
Isophorone	13.4	67.0	57 - 120	57 - 120	30	n/a
Nitrobenzene	25.6	67.0	39 - 120	39 - 120	30	n/a
n-Nitrosodimethylamine	84.0	330	43 - 120	43 - 120	30	n/a
n-Nitrosodi-n-propylamine	20.8	67.0	44 - 120	44 - 120	30	n/a
n-Nitrosodiphenylamine	16.9	67.0	54 - 138	54 - 138	30	n/a
Pentachlorophenol	96.7	330	40 - 123	40 - 123	30	n/a
Phenol	16.1	67.0	37 - 120	37 - 120	30	n/a
2-Fluorophenol	n/a	n/a	n/a	n/a	n/a	22 - 120
Phenol-d5	n/a	n/a	n/a	n/a	n/a	27 - 120
2-Chlorophenol-d4	n/a	n/a	n/a	n/a	n/a	36 - 120
1,2-Dichlorobenzene-d4	n/a	n/a	n/a	n/a	n/a	38 - 120
Nitrobenzene-d5	n/a	n/a	n/a	n/a	n/a	32 - 120
2-Fluorobiphenyl	n/a	n/a	n/a	n/a	n/a	39 - 120
2,4,6-Tribromophenol	n/a	n/a	n/a	n/a	n/a	31 - 131
p-Terphenyl-d14	n/a	n/a	n/a	n/a	n/a	31 - 130
Polycyclic Aromatic Hydrocarbons by SW8270D-SIM (ug/kg)						
1-Methylnaphthalene	1.61	5.00	39 - 120	39 - 120	30	n/a
2-Methylnaphthalene	1.69	5.00	35 - 120	35 - 120	30	n/a
Acenaphthene	1.49	5.00	39 - 120	39 - 120	30	n/a
Acenaphthylene	1.61	5.00	35 - 120	35 - 120	30	n/a
Anthracene	1.78	5.00	36 - 120	36 - 120	30	n/a
Benzo(a)anthracene	2.22	5.00	42 - 120	42 - 120	30	n/a
Benzo(a)pyrene	2.38	5.00	36 - 120	36 - 120	30	n/a
Benzo(b)fluoranthene	2.11	5.00	35 - 127	35 - 127	30	n/a
Benzo(g,h,i)perylene	2.79	5.00	38 - 120	38 - 120	30	n/a
Benzo(k)fluoranthene	2.28	5.00	37 - 129	37 - 129	30	n/a
Chrysene	1.92	5.00	48 - 120	48 - 120	30	n/a
Dibenzo(a,h)anthracene	2.56	5.00	38 - 120	38 - 120	30	n/a
Fluoranthene	1.87	5.00	46 - 120	46 - 120	30	n/a
Fluorene	1.47	5.00	41 - 120	41 - 120	30	n/a
Indeno(1,2,3-c,d)pyrene	3.01	5.00	40 - 120	40 - 120	30	n/a
Naphthalene	2.26	5.00	36 - 120	36 - 120	30	n/a
Phenanthrene	1.58	5.00	46 - 120	46 - 120	30	n/a
Pyrene	2.26	5.00	49 - 120	49 - 120	30	n/a
Total HPAH	n/a	n/a	n/a	n/a	n/a	n/a
Total LPAH	n/a	n/a	n/a	n/a	n/a	n/a
Total PAH	n/a	n/a	n/a	n/a	n/a	n/a
2-Methylnaphthalene-d10	n/a	n/a	n/a	n/a	n/a	32 - 120
Dibenzo[a,h]anthracene-d14	n/a	n/a	n/a	n/a	n/a	21 - 133
Fluoranthene-d10	n/a	n/a	n/a	n/a	n/a	36 - 134

Table A-2. Measurement Quality Objectives for Soil and Sediment Samples

Project No. 210507, 2200 Cooper Point Road NW, Olympia, Washington

Analyte Name	DL[1]	LOQ	LCS/LCS %R[A]	MS/MSD %R[A]	RPD (%)	Surrogate %R[A]
Petroleum Hydrocarbons by NWTPH-Gx/-Dx (mg/kg)						
Gasoline-Range Hydrocarbons	n/a	20	n/a	n/a	n/a	n/a
Diesel-Range Hydrocarbons	1.50	50	n/a	n/a	n/a	n/a
Oil-Range Hydrocarbons	3.00	100	n/a	n/a	n/a	n/a
o-Terphenyl	n/a	n/a	n/a	n/a	n/a	50-150
n-Triacontane	n/a	n/a	n/a	n/a	n/a	50-150
Polychlorinated Biphenyls by EPA 8082 (ug/kg)						
Aroclor 1016	1.56	4	51-120	51-120	30	n/a
Aroclor 1221	1.56	4	51-120	51-120	30	n/a
Aroclor 1232	1.56	4	51-120	51-120	30	n/a
Aroclor 1242	1.56	4	51-120	51-120	30	n/a
Aroclor 1248	1.56	4	51-120	51-120	30	n/a
Aroclor 1254	1.56	4	51-120	51-120	30	n/a
Aroclor 1260	0.589	4	59-120	59-120	30	n/a

Notes

(1) - Based on current laboratory control criteria. Some values may vary slightly between instruments and can be subject to change as the laboratory updates the charted values periodically.

%R - percent recovery

LCS/LCSD - laboratory control samples and laboratory control sample duplicate

DL - Detection Limit

LOQ = Level of Quantitation

mg/kg - milligram per kilogram

MS/MSD - Matrix spike and matrix spike duplicate

n/a - not applicable

RPD - Relative percent difference

ug/kg - micrograms per kilogram

Table A-3. Measurement Quality Objectives for Water Samples

Project No. 210507, 2200 Cooper Point Road NW, Olympia, Washington

Analyte Name	DL[(1)]	LOQ	LCS/LCS %R[(A)]	MS/MSD %R[(A)]	RPD (%)	Surrogate %R[(A)]
Total and Dissolved Metals by EPA 200.8/6020A (u/L)						
Antimony	0.1	0.2	80 - 120	75 - 125	20	n/a
Arsenic	0.048	0.2	80 - 120	75 - 125	20	n/a
Beryllium	0.2	0.1	80 - 120	75 - 125	20	n/a
Cadmium	0.01	0.1	80 - 120	75 - 125	20	n/a
Chromium	0.045	0.5	80 - 120	75 - 125	20	n/a
Copper	0.25	0.5	80 - 120	75 - 125	20	n/a
Lead	0.046	0.1	80 - 120	75 - 125	20	n/a
Nickel	0.25	0.5	80 - 120	75 - 125	20	n/a
Selenium	0.127	0.5	80 - 120	75 - 125	20	n/a
Silver	0.008	0.2	80 - 120	75 - 125	20	n/a
Thallium	0.1	0.2	80 - 120	75 - 125	20	n/a
Zinc	4.0	2.0	80 - 120	75 - 125	20	n/a
Total and Dissolved Mercury by EPA 7470A (ug/L)						
Mercury	0.007000	0.100	80 - 120	75 - 125	20	n/a
Volatile Organic Compounds (VOCs) by SW8260C (ug/L)						
1,1,1,2-Tetrachloroethane	0.0396	0.200	80 - 128	80 - 128	30	n/a
1,1,1-Trichloroethane	0.0408	0.200	79 - 124	79 - 124	30	n/a
1,1,2,2-Tetrachloroethane	0.0598	0.200	80 - 120	80 - 120	30	n/a
1,1,2-Trichloroethane	0.129	0.200	80 - 120	80 - 120	30	n/a
1,1,2-Trichlorotrifluoroethane (Freon 113)	0.0429	0.200	76 - 124	76 - 124	30	n/a
1,1-Dichloroethane	0.0533	0.200	80 - 120	80 - 120	30	n/a
1,1-Dichloroethene	0.0540	0.200	74 - 120	74 - 120	30	n/a
1,2,3-Trichlorobenzene	0.110	0.500	80 - 125	80 - 125	30	n/a
1,2,3-Trichloropropane	0.131	0.500	80 - 120	80 - 120	30	n/a
1,2,4-Trimethylbenzene	0.0243	0.200	80 - 122	80 - 122	30	n/a
1,2-Dibromo-3-chloropropane	0.366	0.500	79 - 129	79 - 129	30	n/a
1,2-Dichloroethane	0.0717	0.200	80 - 121	80 - 121	30	n/a
1,2-Dichloroethene, cis-	0.0427	0.200	78 - 120	78 - 120	30	n/a
1,2-Dichloroethene, trans-	0.0485	0.200	75 - 120	75 - 120	30	n/a
1,2-Dichloropropane	0.0352	0.200	80 - 120	80 - 120	30	n/a
1,3,5-Trimethylbenzene (Mesitylene)	0.0150	0.200	80 - 120	80 - 120	30	n/a
1,3-Dichloropropane	0.0622	0.200	80 - 120	80 - 120	30	n/a
1,3-Dichloropropene, cis-	0.0610	0.200	80 - 127	80 - 127	30	n/a
1,3-Dichloropropene, trans-	0.0815	0.200	79 - 132	79 - 132	30	n/a
1,4-Dichloro-2-butene, trans-	0.324	1.00	47 - 147	47 - 147	30	n/a
2-Butanone (MEK)	0.814	5.00	73 - 123	73 - 123	30	n/a
2-Chlorotoluene	0.0236	0.200	80 - 120	80 - 120	30	n/a
2-Hexanone (Methyl butyl ketone)	0.902	5.00	80 - 129	80 - 129	30	n/a
4-Chlorotoluene	0.0159	0.200	80 - 120	80 - 120	30	n/a
4-Isopropyltoluene (4-Cymene)	0.0263	0.200	80 - 124	80 - 124	30	n/a
Acetone	2.06	5.00	64 - 125	64 - 125	30	n/a
Acrolein	2.48	5.00	60 - 124	60 - 124	30	n/a
Acrylonitrile	0.604	1.00	76 - 123	76 - 123	30	n/a
Benzene	0.0266	0.200	80 - 120	80 - 120	30	n/a
Bromobenzene	0.0605	0.200	80 - 120	80 - 120	30	n/a
Bromochloromethane	0.0607	0.200	80 - 120	80 - 120	30	n/a
Bromodichloromethane	0.0506	0.200	80 - 122	80 - 122	30	n/a
Bromoform (Tribromomethane)	0.0618	0.200	62 - 149	62 - 149	30	n/a
Bromomethane (Methyl bromide)	0.252	1.00	68 - 130	68 - 130	30	n/a
Carbon disulfide	0.0370	0.200	77 - 124	77 - 124	30	n/a
Carbon tetrachloride (Tetrachloromethane)	0.0439	0.200	71 - 139	71 - 139	30	n/a
Chlorobenzene	0.0230	0.200	80 - 120	80 - 120	30	n/a
Chloroethane	0.0861	0.200	68 - 133	68 - 133	30	n/a
Chloroform	0.0273	0.200	80 - 120	80 - 120	30	n/a
Chloromethane	0.0948	0.500	77 - 122	77 - 122	30	n/a
Dibromochloromethane	0.0481	0.200	80 - 120	80 - 120	30	n/a
Dibromomethane	0.145	0.200	80 - 120	80 - 120	30	n/a
Dichlorodifluoromethane	0.0521	0.200	68 - 133	68 - 133	30	n/a
Dichloromethane (Methylene chloride)	0.485	1.00	71 - 125	71 - 125	30	n/a
Ethylbenzene	0.0371	0.200	80 - 120	80 - 120	30	n/a
Ethylene dibromide (1,2-Dibromoethane)	0.0745	0.200	80 - 120	80 - 120	30	n/a
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	0.0734	0.500	80 - 135	80 - 135	30	n/a
Isopropylbenzene (Cumene)	0.0212	0.200	80 - 120	80 - 120	30	n/a
Methyl iodide (Iodomethane)	0.227	1.00	76 - 123	76 - 123	30	n/a
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))	0.974	5.00	80 - 125	80 - 125	30	n/a
Methyl tert-butyl ether (MTBE)	0.0729	0.500	79 - 121	79 - 121	30	n/a
n-Butylbenzene	0.0248	0.200	80 - 125	80 - 125	30	n/a
n-Propylbenzene	0.0235	0.200	80 - 120	80 - 120	30	n/a
o-Xylene	0.0349	0.200	80 - 120	80 - 120	30	n/a
sec-Butylbenzene	0.0237	0.200	80 - 121	80 - 121	30	n/a
Styrene	0.0454	0.200	80 - 121	80 - 121	30	n/a
tert-Butylbenzene	0.0256	0.200	80 - 121	80 - 121	30	n/a
Tetrachloroethene (PCE)	0.0474	0.200	80 - 120	80 - 120	30	n/a
Toluene	0.0399	0.200	80 - 120	80 - 120	30	n/a
Trichloroethene (TCE)	0.0489	0.200	80 - 120	80 - 120	30	n/a
Trichlorofluoromethane (Fluorotrichloromethane)	0.0375	0.200	74 - 135	74 - 135	30	n/a
Vinyl acetate	0.0688	0.200	74 - 120	74 - 120	30	n/a
Vinyl chloride	0.0572	0.200	74 - 123	74 - 123	30	n/a
Semivolatile Organic Compounds (SVOCs) by SW8270D (ug/L)						
1,2,4-Trichlorobenzene	0.254	1.00	28 - 120	28 - 120	30	n/a
1,2-Dichlorobenzene	0.250	1.00	28 - 120	28 - 120	30	n/a
1,3-Dichlorobenzene	0.266	1.00	24 - 120	24 - 120	30	n/a
1,4-Dichlorobenzene	0267	1.00	24 - 120	24 - 120	30	n/a
1,4-Dioxane	0.0847	0.4	45-120	45-120	40	39-129
2,2'-Oxybis (1-chloropropane)	0.241	1.00	47 - 120	47 - 120	30	n/a
2,3,4,6-Tetrachlorophenol	0.244	1.00	58 - 120	58 - 120	30	n/a
2,4,5-Trichlorophenol	1.10	5.00	58 - 120	58 - 120	30	n/a
2,4,6-Trichlorophenol	1.04	3.00	53 - 120	53 - 120	30	n/a
2,4-Dichlorophenol	1.11	3.00	54 - 120	54 - 120	30	n/a
2,4-Dimethylphenol	1.12	3.00	37 - 120	37 - 120	30	n/a

Table A-3. Measurement Quality Objectives for Water Samples

Project No. 210507, 2200 Cooper Point Road NW, Olympia, Washington

Analyte Name	DL[(1)]	LOQ	LCS/LCS %R[(A)]	MS/MSD %R[(A)]	RPD (%)	Surrogate %R[(A)]
2,4-Dinitrophenol	3.35	20.0	40 - 120	40 - 120	30	n/a
2,4-Dinitrotoluene	1.12	3.00	51 - 120	51 - 120	30	n/a
2,6-Dinitrotoluene	1.14	3.00	52 - 120	52 - 120	30	n/a
2-Chloronaphthalene	0.248	1.00	42 - 120	42 - 120	30	n/a
2-Chlorophenol	0.220	1.00	48 - 120	48 - 120	30	n/a
2-Methylphenol (o-Cresol)	0.211	1.00	44 - 120	44 - 120	30	n/a
2-Nitroaniline	1.46	3.00	31 - 120	31 - 120	30	n/a
2-Nitrophenol	0.263	3.00	47 - 120	47 - 120	30	n/a
3,3'-Dichlorobenzidine	1.77	5.00	44 - 120	44 - 120	30	n/a
3-Methylphenol & 4-Methylphenol (m&p-Cresol)	n/a	n/a	n/a	n/a	n/a	n/a
3-Methylphenol (m-Cresol)	n/a	n/a	n/a	n/a	n/a	n/a
3-Nitroaniline	1.53	3.00	36 - 120	36 - 120	30	n/a
4-Bromophenyl-phenyl ether	0.238	1.00	56 - 120	56 - 120	30	n/a
4-Chloro-3-methylphenol	1.12	3.00	59 - 120	59 - 120	30	n/a
4-Chloroaniline	1.73	5.00	10 - 132	10 - 132	30	n/a
4-Methylphenol (p-Cresol)	0.468	2.00	48 - 120	48 - 120	30	n/a
4-Nitroaniline	2.02	3.00	25 - 132	25 - 132	30	n/a
4-Nitrophenol	1.75	10.0	44 - 129	44 - 129	30	n/a
Aniline	0.973	1.00	21 - 120	21 - 120	30	n/a
Benzoic acid	3.92	3.92	37 - 120	37 - 120	30	n/a
Benzyl alcohol	0.552	0.552	26 - 120	26 - 120	30	n/a
bis(2-Chloroethoxy)methane	0.237	1.00	48 - 120	48 - 120	30	n/a
bis(2-Chloroethyl)ether	0.248	1.00	50 - 120	50 - 120	30	n/a
bis(2-Ethylhexyl)phthalate	2.14	3.00	58 - 120	58 - 120	30	n/a
Butylbenzyl phthalate	0.299	1.00	54 - 120	54 - 120	30	n/a
Dibenzofuran	0.309	1.00	36 - 120	36 - 120	30	n/a
Diethyl phthalate	0.273	1.00	60 - 120	60 - 120	30	n/a
Dimethyl phthalate	0.259	1.00	61 - 120	61 - 120	30	n/a
Di-n-butyl phthalate	0.291	1.00	65 - 120	65 - 120	30	n/a
Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	3.61	10.0	56 - 120	56 - 120	30	n/a
Di-n-octyl phthalate	0.268	1.00	62 - 120	62 - 120	30	n/a
Hexachlorobenzene	0.280	1.00	54 - 120	54 - 120	30	n/a
Hexachlorocyclopentadiene	1.08	5.00	16 - 120	16 - 120	30	n/a
Hexachloroethane	0.300	2.00	18 - 120	18 - 120	30	n/a
Isophorone	0.423	1.00	57 - 120	57 - 120	30	n/a
Nitrobenzene	0.253	1.00	49 - 120	49 - 120	30	n/a
n-Nitrosodimethylamine	1.33	3.00	41 - 120	41 - 120	30	n/a
n-Nitrosodi-n-propylamine	0.269	1.00	50 - 120	50 - 120	30	n/a
n-Nitrosodiphenylamine	0.299	1.00	48 - 120	48 - 120	30	n/a
Pentachlorophenol	1.89	10.0	40 - 131	40 - 131	30	n/a
Phenol	0.271	1.00	48 - 120	48 - 120	30	n/a
Polycyclic Aromatic Hydrocarbons (PAHs) by SW8270D-SIM (ug/L)						
1-Methylnaphthalene	0.00313	0.0100	29 - 120	29 - 120	30	n/a
2-Methylnaphthalene	0.00384	0.0100	37 - 120	37 - 120	30	n/a
Acenaphthene	0.00311	0.0100	41 - 120	41 - 120	30	n/a
Acenaphthylene	0.00317	0.0100	41 - 120	41 - 120	30	n/a
Anthracene	0.00248	0.0100	40 - 120	40 - 120	30	n/a
Benzo(a)anthracene	0.00347	0.0100	42 - 120	42 - 120	30	n/a
Benzo(a)pyrene	0.00237	0.0100	35 - 120	35 - 120	30	n/a
Benzo(b)fluoranthene	0.00356	0.0100	44 - 120	44 - 120	30	n/a
Benzo(g,h,i)perylene	0.00312	0.0100	38 - 120	38 - 120	30	n/a
Benzo(k)fluoranthene	0.00345	0.0100	50 - 120	50 - 120	30	n/a
Chrysene	0.00313	0.0100	44 - 120	44 - 120	30	n/a
Dibenzo(a,h)anthracene	0.00303	0.0100	34 - 120	34 - 120	30	n/a
Fluoranthene	0.00337	0.0100	45 - 120	45 - 120	30	n/a
Fluorene	0.00317	0.0100	43 - 120	43 - 120	30	n/a
Indeno(1,2,3-c,d)pyrene	0.00334	0.0100	37 - 120	37 - 120	30	n/a
Naphthalene	0.00740	0.0100	37 - 120	37 - 120	30	n/a
Phenanthrene	0.00299	0.0100	41 - 120	41 - 120	30	n/a
Pyrene	0.00417	0.0100	41 - 120	41 - 120	30	n/a
Total Benzofluoranthenes (b,j,k)	0.00356	0.0100	46 - 120	46 - 120	30	n/a
Total HPAH	n/a	n/a	n/a	n/a	n/a	n/a
Total LPAH	n/a	n/a	n/a	n/a	n/a	n/a
Total PAH	n/a	n/a	n/a	n/a	n/a	n/a
Petroleum Hydrocarbons by NWTPH-Gx/-Dx (ug/L)						
Gasoline-Range Hydrocarbons	n/a	250	n/a	n/a	n/a	n/a
Diesel-Range Hydrocarbons	30	500	n/a	n/a	n/a	n/a
Oil-Range Hydrocarbons	50	1000	n/a	n/a	n/a	n/a
o-Terphenyl	n/a	n/a	n/a	n/a	n/a	50-150
n-Triacontane	n/a	n/a	n/a	n/a	n/a	50-150
PCB Aroclors by SW8082A (ug/L)						
Aroclor 1016	0.00248	0.01	50-103	25-144	30	n/a
Aroclor 1221	0.00276	0.01	n/a	n/a	n/a	n/a
Aroclor 1232	0.00276	0.01	n/a	n/a	n/a	n/a
Aroclor 1242	0.00248	0.01	n/a	n/a	n/a	n/a
Aroclor 1248	0.00248	0.01	n/a	n/a	n/a	n/a
Aroclor 1254	0.00248	0.01	n/a	n/a	n/a	n/a
Aroclor 1260	0.00276	0.01	56-100	40-127	30	n/a
Tetrachloro-m-xylene	n/a	n/a	n/a	n/a	n/a	50-150

Notes

(1) - Based on current laboratory control criteria. Some values may vary slightly between instruments and can be subject to change as the laboratory updates the charted values periodically.

%R - Percent recovery

DL - Detection Limit

LCS/LCSD - Laboratory control samples and laboratory control sample duplicate

LOQ - Level of Quantitation

MS/MSD - Matrix spike and matrix spike duplicate

n/a - not applicable

RPD - Relative percent difference

ug/L - microgram per liter

Table A-4. Measurement Quality Control Indicators

Project No. 210507, 2200 Cooper Point Road NW, Olympia, Washington

Measurement Quality Indicators	QC Parameters
Precision	RPD values of:
	(1) LCS/LCS Duplicate
	(2) MS/MSD
	(3) Field Duplicates
Accuracy/Bias	Percent Recovery (%R) or Percent Difference (%D) Values of:
	(1) Initial Calibration and Calibration Verification
	(2) LCS
	(3) MS
	(4) Surrogate Spikes
	Results of:
	(1) Instrument and Calibration Blank
	(2) Method (Preparation) Blank
	(3) Trip Blank
	(4) Equipment Rinsate Blank
Representativeness	Results of All Blanks
	Sample Integrity (CoC and Sample Receipt Forms)
	Holding Times
Comparability	Sample-specific Reporting Limits
	Sample Collection Methods
	Laboratory Analytical Methods
Completeness	Data Qualifiers
	Laboratory Deliverables
	Requested/Reported Valid Results
Sensitivity	MDLs and MRLs

Notes

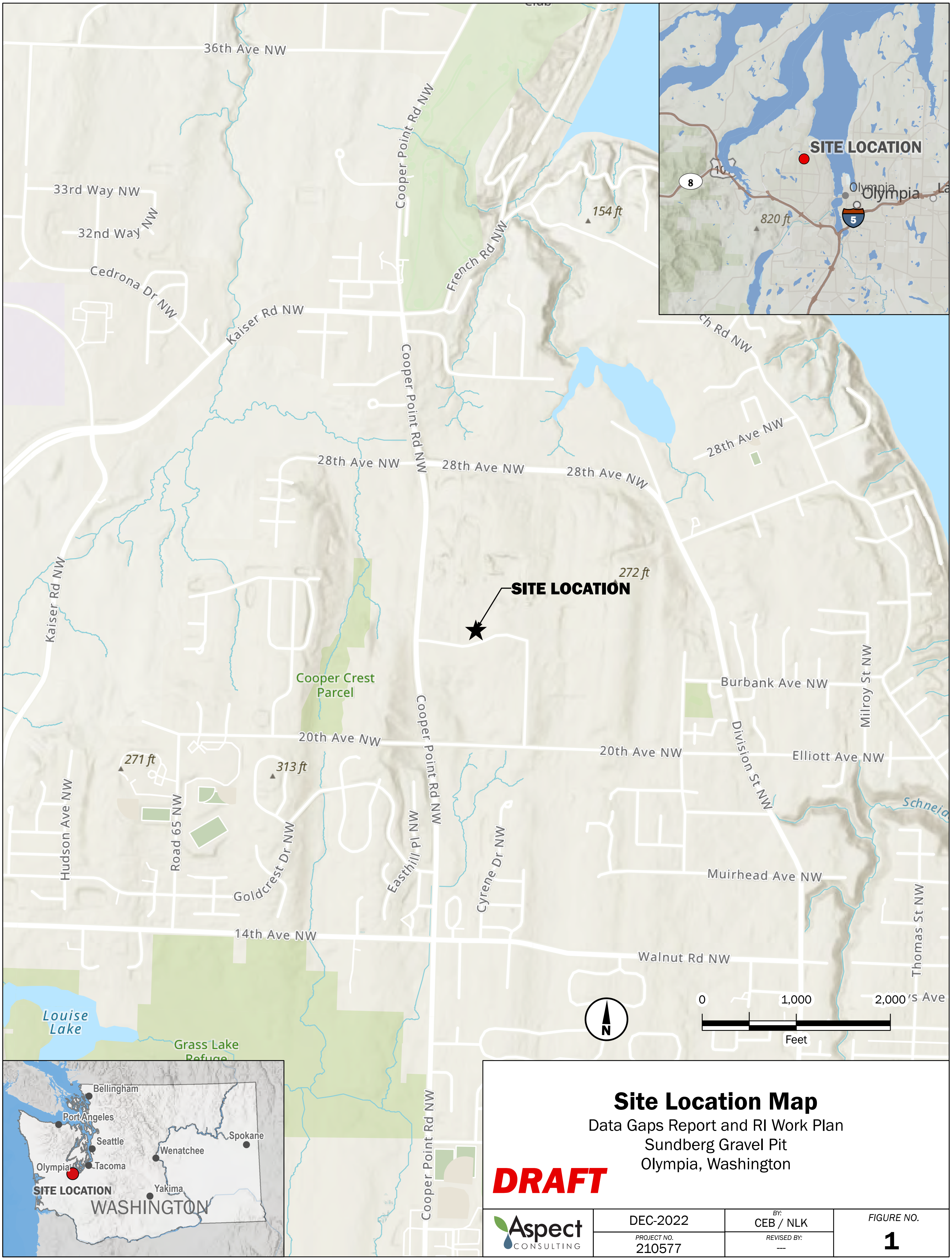
LCS = Laboratory Control Sample

MDL = Method Detection Limit

MRL = Method Reporting Limit

MS/MSD = Matrix Spike/Matrix Spike Duplicate

FIGURES



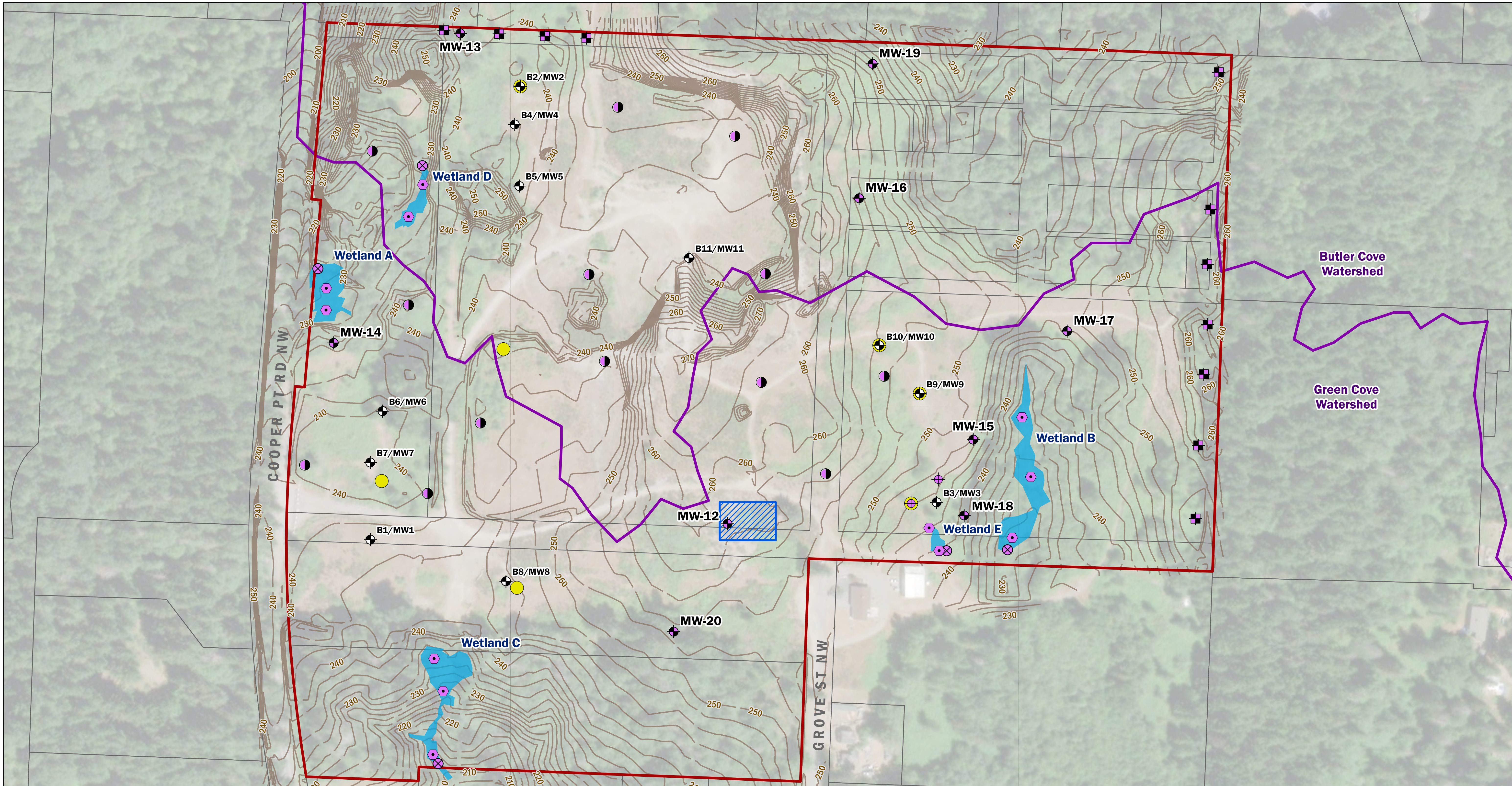
Site Location Map

Data Gaps Report and RI Work Plan
Sundberg Gravel Pit
Olympia, Washington

DRAFT

Aspect CONSULTING

DEC-2022	BY: CEB / NLK	FIGURE NO.
PROJECT NO. 210577	REVISED BY: ---	1



Proposed Explorations

- Soil Boring Location
- Test Pit Exploration Location
- Monitoring Well Location
- Fill Investigation Location
- Preliminary Wetland Sediment Sampling Station
- Preliminary Wetland Surface Water Sample Location

- Methane Sample Location
- Existing Monitoring Well (AEG 2020/2021)
- Approximate location of former Underground Storage Tank (UST) and petroleum-impacted soil stockpile
- Wetland Boundary
- Green Cove Watershed

- 2-foot Contours
- Subject Property
- Thurston County Tax Parcel

Note: Locations are approximate.

N

0 100 200 Feet

Remedial Investigation Approach

Sampling and Analysis Plan
Sundberg Gravel Pit
Olympia, Washington

DRAFT

Aspect CONSULTING

MAY-2023	BY: CEB / NLK	FIGURE NO. A2
PROJECT NO. 210577	REVISED BY: - - - / - - -	

ATTACHMENT A

Field Forms

Sundberg Gravel Pit, 210577
Gas Monitoring Record

Aspect CONSULTING

Gas Probe ID: MW-2

Date & Time:

Field Personnel:

Casing Volume Purged	Volume Purged (cc)	Purge Rate (cc/min)	Purge Time (s)	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (ppm)	Bal (%volume)
0	0	0	0					
0.5	4,650	3000	93					
1.0	9,300	3000	186					
1.5	13,950	3000	279					
2.0	18,600	3000	372					
2.5	23,250	3000	465					
3.0	27,900	3000	558					

Comments:

Baro. Pressure (in Hg):
Probe Pressure (" wc):
Total Casing Volume (cc): 9,300
Probe Diameter (in): 2
Stickup (ft): 0
Top of Screen (ft): 10
Depth to Water (ft):
Total Depth (ft): 15

Screen submerged?

Sundberg Gravel Pit, 210577
Gas Monitoring Record

Gas Probe ID: MW-9

Date & Time:

Field Personnel:

Casing Volume Purged	Volume Purged (cc)	Purge Rate (cc/min)	Purge Time (s)	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (ppm)	Bal (%volume)
0	0	0	0					
0.5	4,650	3000	93					
1.0	9,300	3000	186					
1.5	13,950	3000	279					
2.0	18,600	3000	372					
2.5	23,250	3000	465					
3.0	27,900	3000	558					

Comments:

Baro. Pressure (in Hg):	
Probe Pressure (" wc):	
Total Casing Volume (cc):	9,300
Probe Diameter (in):	2
Stickup (ft):	0
Top of Screen (ft):	5
Depth to Water (ft):	
Total Depth (ft):	15

Screen submerged?

Sundberg Gravel Pit, 210577
Gas Monitoring Record

Aspect CONSULTING

Gas Probe ID: MW-10

Date & Time:

Field Personnel:

Casing Volume Purged	Volume Purged (cc)	Purge Rate (cc/min)	Purge Time (s)	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (ppm)	H_2S (ppm)	Bal (%volume)
0	0	0	0						
0.5	4,650	3000	93						
1.0	9,300	3000	186						
1.5	13,950	3000	279						
2.0	18,600	3000	372						
2.5	23,250	3000	465						
3.0	27,900	3000	558						

Comments:

Baro. Pressure (in Hg):	
Probe Pressure (" wc):	
Total Casing Volume (cc):	9,300
Probe Diameter (in):	2
Stickup (ft):	0
Top of Screen (ft):	5
Depth to Water (ft):	
Total Depth (ft):	15

Screen submerged?

Sundberg Gravel Pit, 210577
Gas Monitoring Record

Aspect CONSULTING

Gas Probe ID: GP-1

Date & Time:

Field Personnel:

Casing Volume Purged	Volume Purged (cc)	Purge Rate (cc/min)	Purge Time (s)	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (ppm)	H_2S (ppm)	Bal (%volume)
0	0	0	0						
0.5	300	550	33						
1.0	600	550	65						
1.5	900	550	98						
2.0	1,200	550	131						
2.5	1,500	550	164						
3.0	1,800	550	196						

Comments:

Baro. Pressure (in Hg):
Probe Pressure (" wc):
Total Casing Volume (cc): 600
Probe Diameter (in): 0.75
Stickup (ft): 2.5
Top of Screen (ft): -3
Depth to Water (ft):
Total Depth (ft): 7

Screen submerged?

Sundberg Gravel Pit, 210577
Gas Monitoring Record

Aspect CONSULTING

Gas Probe ID: GP-2

Date & Time:

Field Personnel:

Casing Volume Purged	Volume Purged (cc)	Purge Rate (cc/min)	Purge Time (s)	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (ppm)	H_2S (ppm)	Bal (%volume)
0	0	0	0						
0.5	500	550	55						
1.0	1,000	550	109						
1.5	1,500	550	164						
2.0	2,000	550	218						
2.5	2,500	550	273						
3.0	3,000	550	327						

Comments:

Baro. Pressure (in Hg):	
Probe Pressure (" wc):	
Total Casing Volume (cc):	1,000
Probe Diameter (in):	0.75
Stickup (ft):	2.5
Top of Screen (ft):	2
Depth to Water (ft):	
Total Depth (ft):	12

Screen submerged?

Sundberg Gravel Pit, 210577
Gas Monitoring Record

Gas Probe ID: GP-3

Date & Time:

Field Personnel:

Casing Volume Purged	Volume Purged (cc)	Purge Rate (cc/min)	Purge Time (s)	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (ppm)	H_2S (ppm)	Bal (%volume)
0	0	0	0						
0.5	300	550	33						
1.0	600	550	65						
1.5	900	550	98						
2.0	1,200	550	131						
2.5	1,500	550	164						
3.0	1,800	550	196						

Comments:

Baro. Pressure (in Hg):	
Probe Pressure (" wc):	
Total Casing Volume (cc):	600
Probe Diameter (in):	0.75
Stickup (ft):	2.5
Top of Screen (ft):	-3
Depth to Water (ft):	
Total Depth (ft):	7

Screen submerged?

Sundberg Gravel Pit, 210577
Gas Monitoring Record

Aspect CONSULTING

Gas Probe ID: GP-4

Date & Time:

Field Personnel:

Casing Volume Purged	Volume Purged (cc)	Purge Rate (cc/min)	Purge Time (s)	CH_4 (%volume)	CO_2 (%volume)	O_2 (%volume)	CO (ppm)	H_2S (ppm)	Bal (%volume)
0	0	0	0						
0.5	500	550	55						
1.0	1,000	550	109						
1.5	1,500	550	164						
2.0	2,000	550	218						
2.5	2,500	550	273						
3.0	3,000	550	327						

Comments:

Baro. Pressure (in Hg):

Probe Pressure (" wc):

Total Casing Volume (cc): 1,000

Probe Diameter (in): 0.75

Stickup (ft): 2.5

Top of Screen (ft): 1

Depth to Water (ft):

Screen submerged?

Total Depth (ft): 11

APPENDIX B

Previous Exploration Logs

maps, which identified the area as the Alderwood series – a soil with shallow glacial till that tends to perch seasonal groundwater. This appears to be due to mining and removal of the overlying impermeable ablative till, and subsequent exposure of underlying gravelly and sandy advance outwash glacial deposits. Unfortunately, because these exposed substrates have been weathering for such a short period of time (some less than 1 year, most less than 50), evidence of seasonal saturation in the substrates that would develop over decades or centuries of chemical and physical changes are for the most part lacking or inconclusive.

For reasons explained above, it may be prudent to engage for a Phase II site assessment to verify if there are buried contaminants in the very common deep fills that dominate the site, but also for a more extensive geotechnical site assessment to provide a formal evaluation of the type of fill, whether it is or is not structural, and whether it might be necessary to remove fill entirely in some areas.

Robinson and Noble does provide Phase II site assessments; they might also have staff that could provide geotechnical assessments in concert with the drilling needed for Phase II work – which might be less expensive overall.

Respectfully submitted,

Pacific Rim Soil and Water, Inc.
Lisa Palazzi, CPSS

Pit 1

Horiz	Dpth	Col	CF	Txt	Struc	Perc	Mott	Roots	OM	%C
A	0-9	10YR3/2	10	L	WFSBk	0.2-0.6	—	CF, CM	6	12
Bs	9-18	10YR3/3	15	GrSL	MMSBk	2-6	—	CF, CM	<3	15
2Bsm	18-27	10YR4/3	15	GrLFS	MA sw	0-0.06	CMD	FM, FF	—	<10
2Cd	27-48	10YR4/2	25	GrLFS	MA	0-0.06	CMD	—	—	<10

Pit 1 was excavated in the far southeast corner of the site, in an area proposed for a stormwater facility. It was typical Alderwood soils with densic till at 27+ inches depth; harder till at 48 inches.

Pit 2

Horiz	Dpth	Col	CF	Txt	Struc	Perc	Mott	Roots	OM	%C
Fill1	0-23	mixed	25	GrLFS	MA	0-0.06	CMD	MF, CM	4	15
Fill2	23-33	10YR4/1	10	LFS	MA	0-0.06	CMD	CF	<3	<10
2Cd	33-60	10YR4/2	35	VGrLFS	MA	0-0.06	CMD	—	<3	<10
3C	60+	10YR4/3	--	LFS	WFSBk	0.6	—	—	<3	<10

Pit 2 was located farther north in the same proposed stormwater facility area. The surface was reworked fill and native surface over densic till and with loamy fine sand below.

Pit 3

Horiz	Dpth	Col	CF	Txt	Struc	Perc	Mott	Roots	OM	%C
Fill	0-19	10YR3/2	40	VGrLFS	MA	<0.2	--	MF, CM	4	<10
A	19-24	10YR3/2	40	VGRSL	MA	<0.2	--	MF	6	12
Bs	24-34	10YR3/3	40	VGRSL	MA	0.6-2	--	CF	<3	12
Bsm	34-38	10YR4/3	60	GrLFS	MA	<0.6	CMD	CF	<3	<10
2Cd	38-48	10YR4/3	60	GRLFS	MA/SG	<0.6	CMD	FF	<3	<10
2Cd2	48+	10YR4/2	50	VGrLFS	MA	0-0.06	—	—	<3	<10

Alderwood series. Fill over gravelly over densic till.

Pit 4

Horiz	Dpth	Col	CF	Txt	Struc	Perc	Mott	Roots	OM	%C
A	0-5	10YR3/2	15	GrSL	WFG	<0.6	—	MF, CM	6	12
Bs	5-18	10YR3/3	15	GrSL	WFSBk	06-2	—	CF	4	15
2Bsm	18-27	10YR4/3	35	VGrLFS	MA	<0.6	CMD	—	<3	12
2Cd	27-66+	10YR4/2	40	VGrLFS	MA	0-0.06	CMD	—	<3	<10

Alderwood series. Densic till at 27 inches; very gravelly

Pit 5

Horiz	Dpth	Col	CF	Txt	Struc	Perc	Mott	Roots	OM	%C
Fill	0-30	10YR5/4	15	GrSL	MIXED	2-6	—	CM	3	--
B1	30-39	10YR5/4	15	GrSL	MMSBk	2-6	—	CM	<3	18
B2	39-52	10YR5/4	15	GrSL	MMSBK	2-6	--	CM	<3	18
C1	52-90	10YR6/3	0	SiL	MA	0.6-2	--	FM	<3	18
C2m	90-120	10YR4/2	35	VGRSL	MA	0.06-0.2	CMD	—	<3	<10

Soil surface slopes to east. Soil pit measurements are taken from the high side. Base of pit varies from 5-7 feet below grade, dependent on where one take the measurement. From 0-30 is old fill – estimated at 50-100 years old. Below that, the buried surface is full of charcoal. The fill is about 40% coarse fragments with sandy loam fine fraction texture and weakly cemented zones. Estimated percolation rate of 2-6 inches per hour through the fill.

Pit 6

Horiz	Dpth	Col	CF	Txt	Struc	Perc	Mott	Roots	OM	%C
Fill	0-72	mixed	gravel – sandy loam – woody debris – concrete chunks....							
B	72-84	10YR5/4	40	VGRSL	WFSBK	6-20	--	--	<3	15
C1	84-156	2.5Y4/3	50	XGrLMS		SG	20+	--	--	<3<10
C2	156-192	2.5Y4/3	50	XGrLMS		SG	20+	--	--	<3<10

Six feet of mixed fill (not structural) overlying very to extremely gravelly sandy substrates with high infiltration potential.

Pit 7

This pit is located in the base of the gravel pit approximately 20 feet lower in elevation than Pit 6. Surface topo here is significantly different than what is shown on GeoData. The pit was dug to 7 feet, where groundwater was encountered. The surface to about 3 feet depth was mixed from gravel pit activities; substrate from 3-7 feet was clean sorted sand and gravel (glacial flood deposit).

Pit 8

This pit is at the east end of an old gravel pit excavation near the northwest site corner, in an area proposed for stormwater facilities.

0-9 inches:	The surface was saturated and compacted fill;
9-16 inches:	10YR5/4 gravelly sandy loam – dry
16-84 inches:	Weakly cemented layered ablative till – expect to be saturated during winter months
84-138 inches:	Loose medium to fine sand with occasional lenses holding up water; damp but not saturated. May be wet in winter, but possibly dry between upper saturated layer and underlying groundwater table.
138-180 inches:	Wet but not saturated. No mottling, but deep enough that it may not have adequate OM content to support microbial population that creates the mottling patterns. Groundwater at 14.5 feet depth, expected to rise in winter months.

Pit 9

Pit is located at west end of same old excavation. The surface is not saturated, nor is there any ablative till layer as was observed in Pit 8. The substrate is medium to fine sand from surface to 14.5 feet depth. No gravels. Saturated at 14.5 feet. There was a buried, green plastic, 6" diameter perforated pipe extending to about 15 feet depth that appears to have been either an old monitoring well of some sort or a drain. There was no silica sand screen and no bentonite. Estimated to have been in place at least 10-20 years. It was full of sand, so long since non-functional.

Pit 10

Pit is located right at the southwest corner of Cooper Ridge parcel, or at NW corner of main (central) Sundberg parcel. Mixed fill (non-structural) to 10 feet depth. Possibly disturbed native at 11 feet. The fill smells of diesel or oil; it has large chunks of concrete, asphalt, large boles of wood and construction debris. May be an old dump.

Pit 11
Pit is located southeast of Pit 10 about 100 feet in an area where we noticed earlier had black, non-native material pushed out of scattered mole holes. Fill to 12 feet depth. Pit base at 13.5 feet. Surface 3 feet is compacted and saturated; has a lot of coarse woody debris – 12-18 inch diameter tree boles that may have been placed to create a "corduroy" road surface across the saturated fill. At 12 feet, we broke through the base of fill into clean gravelly to very gravelly medium sand that appeared to be draining. However, that rate of inflow from the saturated fill above was greater than the rate of drainage; the pit was filling. The lowest fill had old Olympia oyster shells, which suggests that some old road may have been surfaced with shell waste from the waterfront (about 100 years old).

Pit 12
Pit was located east of the dirt road running up the west side of the gravel pit, and directly northwest of a small sediment pond on the west side of the gravel pit. 0-8 feet of massive random fill; severely compacted and completely impermeable. Water ponding at 6 feet depth. From 8-10 feet, an old disturbed sandy native surface. Possibly seasonally saturated, but not saturated today.

Pit 13
Pit located in northern portion of proposed southwest stormwater facility. 0-4 feet was relatively clean loamy sand fill. From 4-10 feet, the fill was old asphalt and concrete – structural fill. From 10-11 feet (pit base) – loose 100% woody debris. Did not reach native material.

Pit 14
Pit located in southern portion of proposed southwest stormwater facility. 0-2 feet is mottled sandy loam and loam sand mixed; no woody debris. From 2-12 feet – mixed fill with large logs, chunks of concrete and asphalt (2 feet or more in diameter), rebar; metal strips, cedar planks. Most of the asphalt and concrete debris is at 8-11 feet depth. Water was seeping in rapidly at 12 feet. The substrate below 12 feet was coarse sand, and appears to be native material. Possible that the seeping was from water trapped in fill, but appears to be coming from sandy substrates.

Pit 15
Pit was located about 80 feet east of double-wide trailer south of entry road. Top foot is mottled sandy loam. From 1-7 feet, mixed extremely gravelly sandy loam fill with about 15% woody debris. Fill includes concrete chunks; burn debris, and the base of the fill slopes deeper to the south. So it appears we are digging at the northern edge of a deeper fill hole. Below 7 feet depth, the substrate is native material – extremely gravelly loamy sand with color suggesting that it might once have been within about 3 feet of a native surface. The substrates are seeping rapidly and saturated below 7 feet depth (fill interface).

Pit 16
Pit is located in what may have been parking area west of old shop about 500 feet east and slightly north of Pit 15.
0-32 inches: The surface is clean fill – extremely gravelly loam sand with no wood and no garbage.
32-65 inches: Extremely gravelly loam sand native material with weakly cemented gravels.
65 inches to 11 feet depth: Extremely gravelly coarse sand with Mn stains on rock bases in a series of lenses of gravel.
11-12 feet: Uncemented medium sand – not wet or mottled.

Pit 17
Pit is located in southern portion of a secondary potential stormwater area west of wetland and east of shop (about 400 feet east of Pit 16). This pit had fill to 10+ feet. From 0-6 feet, the upper fill was mixed sandy loam with construction debris and a strong odor of diesel or oil. Below 6 feet, the fill was mostly large logs and lumber, possibly from an old log building. The lumber was squared off logs with notched ends – most pieces about 6-8 feet long (RR ties?). The pit base at 10 feet was still in fill, but was saturated, so we stopped digging since the fill pit sidewalls were unstable. Water was also seeping from 3 feet depth – from above a secondary fill layer. We thought it possible that the water at 10 feet was the same surface elevation as in the wetland to the east?

Pit 18
Pit located farther north, and slightly west of Pit 17 (about 300 feet).
0-7 feet: Relatively clean very gravelly sandy loam fill, massive and mixed with minor amounts of wire, coarse wood, etc. Seeping at 7 feet.
7-9 feet: Older fill with about 60% by volume coarse and fine woody debris and other fill material, including an old tire sidewall.
9-15 feet: The substrate was gleyed and mottled massive coarse sandy loam. Colors indicate saturation, but it is not saturated today. This material is possibly a native material base, but is disturbed and mixed.

Pit 19

Pit is located farther north and slightly west (about 300 feet from Pit 18), just south of cross-site gravel road.
0-30 inches: Massive, dark-brown fine sandy loam fill.
30-40 inches: Massive, severely gleyed silt loam fill.
40 inches to 11 feet: Older fill with dark brownish black color and a great deal of bark (about 25%). The balance is very gravelly sandy loam fill. Possibly a place where logs were stripped of bark?
Seeping at 40 inches, but not below.

Pit 20
Pit is located about 200-300 feet north and slightly west of Pit 19; Profile very similar to Pit 19
0-26 inches: Massive, dark-brown fine sandy loam fill.
26-36 inches: Massive, severely gleyed silt loam fill.
36 inches to 11 feet: Older fill with dark brownish black color and a great deal of bark (about 25%). The balance is very gravelly sandy loam fill.
11 feet+: started to hit a lighter colored layer with concrete chunks.

Pit 21
Pit is located on a wide flat area northwest of the double-wide trailer, and north of the main west to east gravel road. Surface here looks very different than what is shown on GeoData topography maps.
0-13 inches: Very gravelly sandy loam/ loamy sand fill surface; brown colored
13-30 inches: Very gravelly sandy loam/ loamy sand fill; gleyed and mottled (suggesting seasonal saturation)
30 inches to 6 feet: dark brown very gravelly sandy loam with about 10% metal debris
6 feet to 12 feet: Extremely gravelly coarse sand – almost blue in color, indicating seasonally saturated, but no mottles and not 100% saturated today. Water was seeping from top of occasional weakly cemented lenses of sandy gravelly material. Expect more water later in the winter as series of perched water tables develop in this zone.

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS More than 50% Retained on No. 200 Sieve	GRAVEL More than 50% Of Coarse Fraction Retained on No. 4 Sieve	GRAVEL WITH < 5 % FINES	GW	Well-Graded GRAVEL
			GP	Poorly-Graded GRAVEL
		GRAVEL WITH BETWEEN 5 AND 15 % FINES	GW-GM	Well-Graded GRAVEL with silt
			GW-GC	Well-Graded GRAVEL with clay
			GP-GM	Poorly-Graded GRAVEL with silt
			GP-GC	Poorly-Graded GRAVEL with clay
		GRAVEL WITH > 15 % FINES	GM	Silty GRAVEL
			GC	Clayey GRAVEL
	SAND More than 50% Of Coarse Fraction Passes No. 4 Sieve	SAND WITH < 5 % FINES	SW	Well-Graded SAND
			SP	Poorly-Graded SAND
		SAND WITH BETWEEN 5 AND 15 % FINES	SW-SM	Well-Graded SAND with silt
			SW-SC	Well-Graded SAND with clay
			SP-SM	Poorly-Graded SAND with silt
			SP-SC	Poorly-Graded SAND with clay
		SAND WITH > 15 % FINES	SM	Silty SAND
			SC	Clayey SAND
FINE GRAINED SOILS More than 50% Passes No. 200 Sieve	SILT AND CLAY	Liquid Limit Less than 50	ML	Inorganic SILT with low plasticity
			CL	Lean inorganic CLAY with low plasticity
			OL	Organic SILT with low plasticity
		Liquid Limit 50 or more	MH	Elastic inorganic SILT with moderate to high plasticity
			CH	Fat inorganic CLAY with moderate to high plasticity
			OH	Organic SILT or CLAY with moderate to high plasticity
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

(1) Soil descriptions are based on visual field and laboratory observations using the classification methods described in ASTM D-2488. Where laboratory data are available, classifications are in accordance with ASTM D-2487.

(2) Solid lines between soil descriptions indicate a change in the interpreted geologic unit. Dashed lines indicate stratigraphic change within the unit.

(3) Fines are material passing the U.S. No. 200 Sieve.

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www.agesengineering.com

Unified Soil Classification System (USCS)
Sundberg Estates
2200 Cooper Point Road NW
Olympia, Washington

Project No.: A-245 | January 2015 | **Figure A-1**

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Test Pit TP-1

DATE: December 23, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	**FILL:** sand with silt and gravel, trace topsoil, loose, moist.		
	TOPSOIL		
	Gray mottled orange silty **SAND** with gravel, medium dense,moist (SM)		
5	Tan **SAND** with silt, fine-grained sand, medium dense, moist. (SP-SM) (Outwash)		
	Gray **SILT** with sand, fine-grsined sand, medium stiff, moist. (SM) (Outwash)		
	Tan **SAND** with silt, fine-grained sand, medium dense, moist. (SP-SM) (Outwash)		
10	Test Hole terminated at a depth of 10.0 feet below surface grades. No groundwater seepage encountered.		

Test Pit TP-2

DATE: December 23, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	**FILL:** Topsoil, sand, gravel, tree roots, woody debris, loose, moist.		
5	**TOPSOIL**		
	Brown mottled orange **GRAVEL** with silt and sand, medium dense,moist. (GP-SM) (Outwash)		▼
10	Test Hole terminated at a depth of 9.0 feet below surface grades. Moderate groundwater seepage encountered at 8.0 feet below surface grades.		

Figure A-2

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Test Pit TP-3

DATE: December 23, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	Gray mottled orange **SAND** with silt and gravel, cobbles to 6 inches, medium dense, moist. (SP-SM) (Outwash) (Possible Old Fill)		
	Gray **SAND** with silt and gravel, medium dense, moist. (SP-SM) (Outwash) (Possible Old Fill)		
5	Reddish-brown **GRAVEL** with silt and sand, cobbles to 4 inches, medium dense, moist. (GP-GM) (Possible Original Surface Layer)		
	Grayish-brown **GRAVEL** with sand, trace silt, cobbles to 6 inches, medium dense, moist. (GP) (Outwash)		
10	Test Hole terminated at a depth of 9.0 feet below surface grades. No groundwater seepage encountered.		

Test Pit TP-4

DATE: December 23, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	**FILL:** Brown and tan silty sand with gravel, loose, moist.		
	FILL: Brown sand with silt and gravel, some topsoil, loose, moist.		
	FILL: Bluish-gray sandy silt loose, moist.		▼
	TOPSOIL		
5	Gray **SAND** with gravel, coarse-grained sand, cobbles to 4 inches, medium dense, moist. (SP) (Outwash)		
10	Test Hole terminated at a depth of 9.0 feet below surface grades. Light groundwater seepage encountered from 3.5 to 4.0 feet below the surface.		

Figure A-3

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Test Pit TP-5

DATE: December 23, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0–3	**FILL:** Alternating layers of Brown silty sand with gravel and bluish-gray silt with sand, loose, moist.		
3–11	**FILL:** Topsoil, gravel, sand, tree roots, woody debris, and occasional large pieces of wood, loose, moist.		
11–12	Gray **GRAVEL** with silt and sand, medium dense, moist. (GP-GM) (Outwash)		

Test Hole terminated at a depth of 12.0 feet below surface grades.

No groundwater seepage encountered.

Test Pit TP-6

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0–10	**FILL:** Topsoil, gravel, sand, garbage, tree roots, woody debris, loose, moist.		▼ (3.5 ft)

Test Hole terminated at a depth of 10.0 feet below surface grades.

Light groundwater seepage encountered at 3.5 feet below surface grades.

Figure A-4

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Test Pit TP-7

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	**FILL:** Sand, silt, gravel, and topsoil, loose, moist.		
5	Gray **GRAVEL** with silt and sand, cobbles to 6 inches, medium dense, moist. (GP-GM) (Outwash)		
10	Test Hole terminated at a depth of 10.0 feet below surface grades. No groundwater seepage encountered.		

Test Pit TP-8

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0–5	**FILL:** Alternating layers of brown silty gravel with sand, brown silty sand with gravel, bluish-gray silt with sand and gravel, and topsoil with woody debris, loose, moist.		
10	Gray **GRAVEL** with silt and sand, medium dense, moist. (GP-GM) (Outwash)		
	Test Hole terminated at a depth of 13.0 feet below surface grades. No groundwater seepage encountered.		

Figure A-5

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Test Pit TP-9

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	Tan **SAND** with silt and gravel, cobbles to 3 inches, medium dense, moist. (SP-SM) (Outwash) (Possible Old Fill)		
5	Gray **SAND** with silt, trace gravel, medium dense, moist. (SP-SM) (Outwash) (Possible Old Fill)		▼ ▼
	Brown **GRAVEL** with silt and sand, cobbles to 4 inches, medium dense,moist. (GP-GM) (Outwash) (Possible Original Surface Layer)		
10	Test Hole terminated at a depth of 8.0 feet due to heavy sidewall caving. Light groundwater seepage encountered at 3.5 feet, and heavy groundwater seepage encountered at 5.5 feet below surface grades.		

Test Pit TP-10

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	**FILL:** Topsoil, woody debris		
	FILL: Brown to reddish-orange silty sand with gravel, loose, moist.		
5	**FILL:** Topsoil, gravel, sand, silt, cobbles to 6 inches, woody debris, loose, moist. Large logs from 7 to 8 feet.		
10	Test Hole terminated at a depth of 8.0 feet due to large logs. No groundwater seepage encountered.		

Figure A-6

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Test Pit TP-11

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	**TOPSOIL**		
	Reddish-orange silty **SAND** with gravel, medium dense, moist. (SM)		
5	Gray **GRAVEL** with silt and sand, cobbles to 6 inches, medium dense, moist. (GP-GM) (Outwash)		▼
10	Test Hole terminated at a depth of 8.0 feet due to heavy sidewall caving. Moderate groundwater seepage encountered at 6.5 feet below surface grades.		

Test Pit TP-12

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0	Gray **GRAVEL** with silt and sand, cobbles to 4 inches, medium dense, moist. (GP-GM) (Outwash)		
	Gray **SAND,** trace silt and gravel, fine-grained sand, medium dense, moist. (SP) (Outwash)		
5	Gray **GRAVEL** with silt and sand, cobbles to 4 inches, medium dense, moist. (GP-GM) (Outwash)		▼
10	Test Hole terminated at a depth of 7.0 feet belowsurface grades. Light groundwater seepage encountered at 5.5 feet below surface grades.		

Figure A-7

Project No.: A-245

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Test Pit TP-13

DATE: December 24, 2014 LOGGED BY: BPK ELEV:

Depth (feet)	Soil Description	Notes M%	Notes Other
0 – 5	Tan silty **SAND** with gravel, cobbles to 4 inches, medium dense, moist. (SM) (Outwash)		

Test Hole terminated at a depth of 5.0 feet due to heavy sidewall caving.

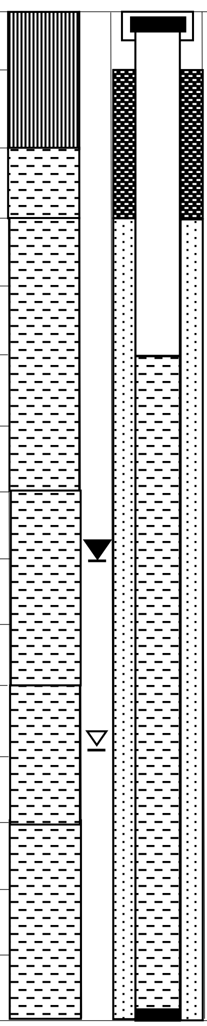
No groundwater seepage encountered.

(Depth scale: 0, 5, 10)

Figure A-8

Client: Green Cove Park Development	**WELL LOG**
Project #: 1903-00129-RI	Boring #: B1 Well #: MW1
Address: 220 Cooper Point Rd NW	Page: 1 of 1

Start Date/Time: 11/09/20; 0830	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/09/20; 0915	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 8	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 10.9	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 241.9	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.065914, -122.941671	Filter Pack: Monterey #2 sand

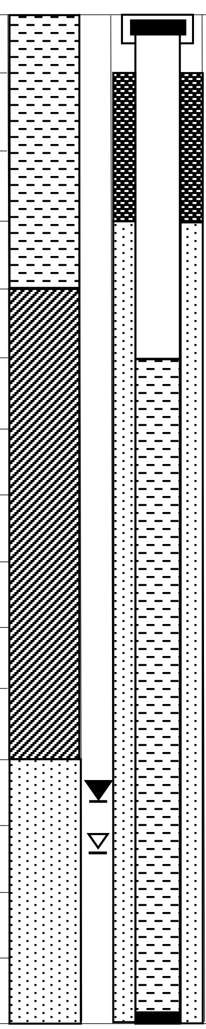


DEPTH (ft)	COLLECT: Sample Type	COLLECT: Time	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Sample ID	DEPTH (ft)
0				OL—Organic silts with gravel (20%), dark yellowish brown topsoil			0
				SM—Silt and sand with cobbles (30%), olive	0.2		
5				SM—Silt and sand with cobbles and gravel (10—20%), olive	0.3 0.3		5
	Soil	0930		SM—Sand and silt with gravel (40—50%), olive	0.3	B1-7	
10				SM—Sand and silt with very little gravel , olive	0.3		10
15	Soil	1000		SM —Sand and silt with increasing gravel and cobbles, olive	0.2 0.2	B1-15	15

NOTES: Groundwater sample MW1-111220 collected 11/12/20 at 1500. Wellhead PID = 0.0 ppm and LEL = 0.0%.

ENPRO environmental	Client: Green Cove Park Development	**WELL LOG**
	Project #: 1903-00129-RI	Boring #: B2 Well #: MW2
	Address: 220 Cooper Point Rd NW	Page: 1 of 1

Start Date/Time: 11/10/20; 1200	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/10/20; 1245	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 11.5	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 12.4	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 214.2	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.068592, -122.940474	Filter Pack: Monterey #2 sand

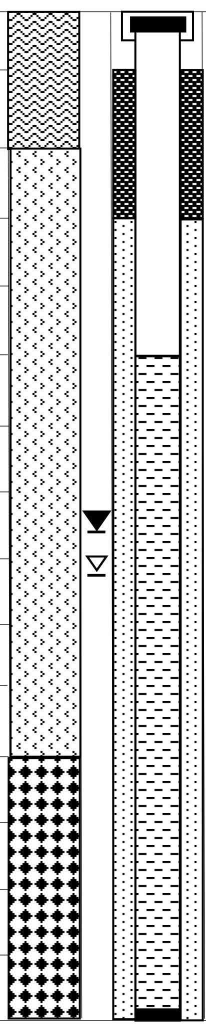


DEPTH (ft)	COLLECT: Sample Type	Time	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	Sample ID	DEPTH (ft)
0				SM—Sandy silt with cobbles and gravel (50%), olive			0
					0.6		
				CL—Clay with cobbles and gravel (30%), gray	0.7		
5							5
					0.8		
	Soil	1245				B2-7/ B2-7a	
					0.6		
10					0.5		10
				SP—Very fine grained sands; well sorted, dark gray			
					0.6		
					0.8		
15	Soil	1245				B2-15/ B2-15a	15

NOTES: Groundwater sample MW2-111320 collected 11/13/20 at 1130. Wellhead PID = 0.2 ppm and LEL = 0.0%.

ENPRO environmental	Client: Green Cove Park Development Project #: 1903-00129-RI Address: 220 Cooper Point Rd NW	**WELL LOG** Boring #: B3 Well #: MW3 Page: 1 of 1

Start Date/Time: 11/09/20; 1040	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/09/20; 1120	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 7.5	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 8.2	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 248.7	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.066258, -122.936654	Filter Pack: Monterey #2 sand

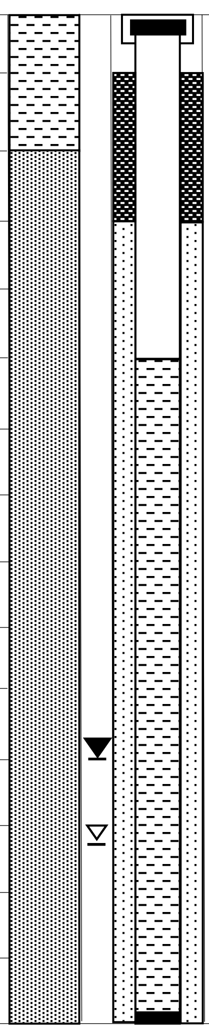


DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Sample ID	DEPTH (ft)
0							OH—Silt and gravel grading to silty clay with gravel. Rounded cobbles and gravel (~5—10%), dark olive topsoil			0
							PT—Peat and highly organic silt with wood fragments and small amount of rounded cobbles (0.25—8.5 inches), black	0.3		
								0.5		
5								0.5		5
				Soil	1100				B3-7/ B3-7a	
								0.4		
10				Soil	1100			26.2	B3-10	10
							GM to GP—Gray, silty gravel and saturated gravelly silt with rounded cobbles (20%) grading to sandy gravel then to gravel, gray	1.2		
								0.6		
15				Soil	1100				B3-15/ B3-15a	15

NOTES: Additional sample collected from 10 feet bgs due to elevated PID reading. Groundwater sample MW3-111420 and duplicate MW3-111420a collected 11/14/20 at 0915 and 0930, respectively. Wellhead PID = 0.0 ppm and LEL = 0.0%.

ENPRO environmental	Client: Green Cove Park Development Project #: 1903-00129-RI Address: 220 Cooper Point Rd NW	**WELL LOG** Boring #: B4 Well #: MW4 Page: 1 of 1

Start Date/Time: 11/09/20; 1430	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/09.20; 1330	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 11	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 12.2	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 214.1	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.068348, -122.940434	Filter Pack: Monterey #2 sand

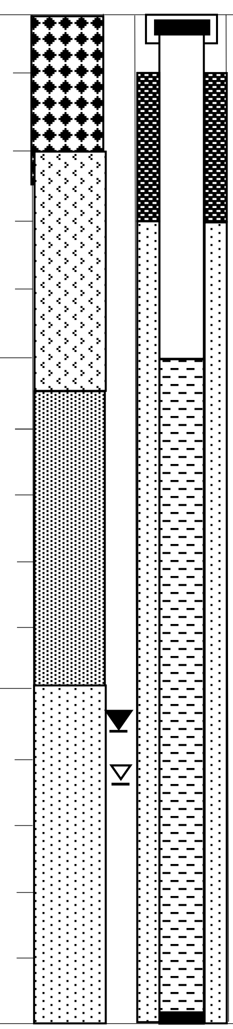


DEPTH (ft)	COLLECT: Sample Type	COLLECT: Time	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Sample ID	DEPTH (ft)
0				SM—Silty sand with gravel (50%), yellowish brown topsoil			0
				SW/SM—Well-sorted, medium grained sand (50%), greenish	0.2		
					0.1		
5					0.2		5
	Soil	1440				B4-7	
					0.2		
10					0.2		10
					0.2		
					0.2		
15	Soil	1440				B4-15	15

NOTES: Groundwater sample MW4-111320 collected 11/13/20 at 0930. Wellhead PID = 0.5 ppm and LEL = 0.0%.

ENPRO environmental	Client: Green Cove Park Development	**WELL LOG**
	Project #: 1903-00129-RI	Boring #: B5 Well #: MW5
	Address: 220 Cooper Point Rd NW	Page: 1 of 1

Start Date/Time: 11/10/20; 1240	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/10/20; 1325	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 10.5	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 11.3	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 218.9	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.067991, -122.940416	Filter Pack: Monterey #2 sand



DEPTH (ft)	COLLECT: Sample Type	Time	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	Sample ID	DEPTH (ft)
0				GM—Silty, sandy, gravel mixture, dark reddish brown			0
				PT—Peat with gravel and clay (fill material), black	0.5		
					0.7		
5				Metal fragments at 5 to 5.5 feet			5
				SW—Medium grained sand with gravel and cobbles (10—20%), olive gray	0.6		
	Soil	1330				B5-7	
					0.9		
10				SP—Very fine grained sands; well sorted, dark gray	Note		10
					0.6		
					0.5		
15	Soil	1330				B5-15	15

NOTES: A PID reading could not be collected from 10 feet bgs due to the presence of scrap metal. Groundwater sample MW5-111220 collected 11/12/20 at 1615. Wellhead PID = 0.3 ppm and LEL = 40.0%.

ENPRO environmental	Client: Green Cove Park Development Project #: 1903-00129-RI Address: 220 Cooper Point Rd NW	**WELL LOG** Boring #: B6 Well #: MW6 Page: 1 of 1

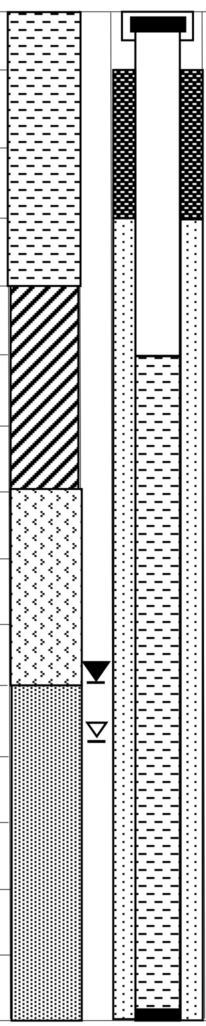
Drilling Start Date/Time:	Boring Depth (ft): 15	Well Depth (ft): 15
Drilling End Date/Time:	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 9	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 9.9	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 247.4	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.066719, -122.941400	Filter Pack: Monterey #2 sand

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Sample ID	DEPTH (ft)
0							SM—Sandy silt with gravel and cobbles (40%), yellowish brown topsoil			0
								0.6		
								0.6		
5										5
							Large (4 inch by 2 inch) oval/sphere asphalt boulder	0.7		
				Soil	1200		SW—Medium grained sand with gravel and cobbles (10—20%), greenish gray		B6-7	
								0.8		
10								0.7		10
								0.7		
								1.0		
15				Soil	1200				B6-15	15

NOTES: Groundwater sample MW6-111220 collected 11/12/20 at 1220. Wellhead PID = 0.1 ppm and LEL = 0.0%.

ENPRO environmental	Client: Green Cove Park Development Project #: 1903-00129-RI Address: 220 Cooper Point Rd NW	**WELL LOG** Boring #: B7 Well #: MW7 Page: 1 of 1

Start Date/Time: 11/10/20; 0900	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/10/20; 0945	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 10	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 10.8	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 226.3	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.066375, -122.941490	Filter Pack: Monterey #2 sand

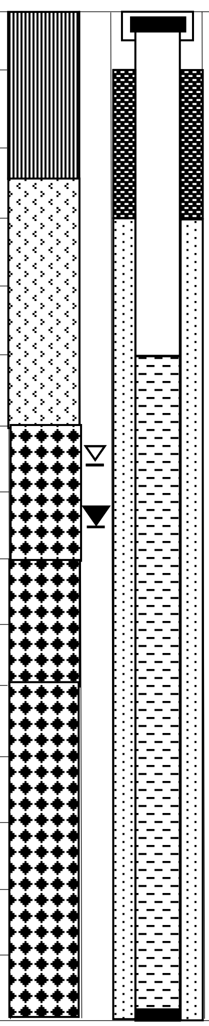


DEPTH (ft)	COLLECT: Sample Type	COLLECT: Time	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Sample ID	DEPTH (ft)
0							0
				SM—Sandy silt with gravel and cobbles (40%), yellowish brown topsoil	0.3		
				SC—Silt with clay and gravel (~50%); concrete debris at 6—7 feet bgs, dark brown	0.3		
5							5
					0.3		
	Soil	0950		PT—Peat with wood debris and gravel (~10%), black	0.5	B7-7	
10				SW/SM—Well-sorted, medium grained sand, greenish gray	1.4		10
					0.6		
					0.8		
15	Soil	0950				B7-15	15

NOTES: Groundwater sample MW7-111220 collected 11/12/20 at 1345. Wellhead PID = 0.2 ppm and LEL = 0.0%.

ENPRO environmental	Client: Green Cove Park Development Project #: 1903-00129-RI Address: 220 Cooper Point Rd NW	**WELL LOG** Boring #: B8 Well #: MW8 Page: 1 of 1

Drilling Start Date/Time:	Boring Depth (ft): 15	Well Depth (ft): 15
Drilling End Date/Time:	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 7.5	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 6.5	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 254.2	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.065724, -122.940326	Filter Pack: Monterey #2 sand



DEPTH (ft)	COLLECT: Sample Type	Time	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	Sample ID
0				OL—Organic silt and sand with gravel and rounded cobbles, dark yellowish brown topsoil	0.3	
				PT—Peat, highly organic silt with wood fragments and concrete debris; some rounded cobbles, black	0.4	
5					0.3	
	Soil	1030		GM—Sandy, silty gravel, olive		B8-7
				GM—Silty gravel with sand (~30%) and cobbles, olive	0.3	
10				GM—Gravel with sand (20—40%), pale olive	0.2	
					0.3	
					0.2	
15	Soil	1030				B8-15

NOTES: Groundwater sample MW8-111420 collected 11/14/20 at 1030. Wellhead PID = 0.3 ppm and LEL = 0.0%.

ENPRO environmental	Client: Green Cove Park Development	**WELL LOG**
	Project #: 1903-00129-RI	Boring #: B9 Well #: MW9
	Address: 220 Cooper Point Rd NW	Page: 1 of 1

Start Date/Time: 11/09/20; 1140	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/09/20; 1220	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 13.5	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 14.0	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 261.3	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.066891, -122.936880	Filter Pack: Monterey #2 sand

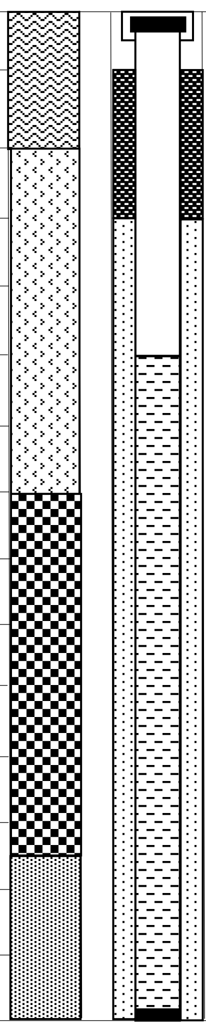
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Sample ID	DEPTH (ft)
0							OL—Sandy silt with gravel , dark grayish brown topsoil			0
							PT—Peat, highly organic silt with wood fragments and concrete debris; some rounded cobbles, black	0.6		
								1.0		
5										5
								0.7		
				Soil	1230				B9-7	
							ML—Inorganic silt with sand and gravel, dark yellowish brown	0.6		
10								0.6		10
							SM—Saturated silty sand with gravel (10%), dark yellowish brown	0.4		
				Soil	1230			0.6		
15									B9-15	15

NOTES: Approximately 1 foot of water was present in MW9 and was declared effectively dry; a groundwater sample could not be collected.

ENPRO environmental	Client: Green Cove Park Development Project #: 1903-00129-RI Address: 220 Cooper Point Rd NW	**WELL LOG** Boring #: 10 Well #: MW10 Page: 1 of 1

Start Date/Time: 11/09/20; 1240	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/09/20; 1320	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): NA	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): NA	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 249.8	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.067168, -122.937087	Filter Pack: Monterey #2 sand

DEPTH (ft) | LITHOLOGY | WATER LEVEL | WELL COMPLETION | COLLECT: Sample Type, Time, Recovery (ft) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm), Sample ID | DEPTH (ft)

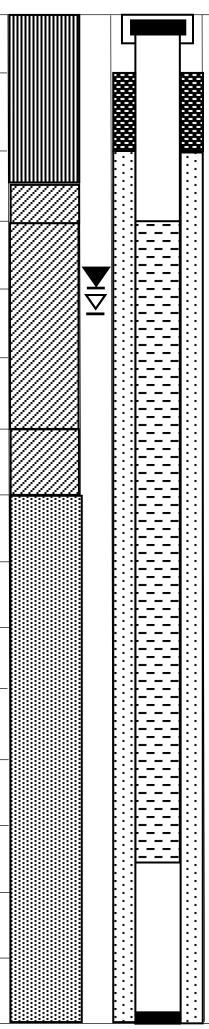


DEPTH (ft)	Sample Type	Time	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	PID (ppm)	Sample ID	DEPTH (ft)
0				OH—Clay with gravel and cobbles (~10—15%), brown			0
				PT—Peat with gravel and cobbles (50%), black	0.5		
					0.8		
5							5
					0.6		
	Soil	1315		GP/SC—Poorly graded gravels with sands, silts, and clays, brown		B10-7	
					0.4		
10					0.4		10
					0.4		
				SW—Well-graded, medium grained sand with gravel (~5—10%) No free water, light olive gray	0.4		
15	Soil	1315				B10-15	15

NOTES: No water was present in MW10 and was declared dry; a groundwater sample could not be collected.

ENPRO environmental	Client: Green Cove Park Development Project #: 1903-00129-RI Address: 220 Cooper Point Rd NW	**WELL LOG** Boring #: 11 Well #: MW11 Page: 1 of 1

Start Date/Time: 11/09/20; 1340	Boring Depth (ft): 15	Well Depth (ft): 15
End Date/Time: 11/09/20; 1415	Boring Diameter (in): 6	Well Diameter (in): 2
Drilling Company: Cascade Env.	Sampling Method(s): Discrete (5035)	Screen Slot (in): 0.020
Drilling Method: Sonic	DTW During Drilling (ft): 4	Riser Material: PVC
Drilling Equipment: Longyear DB-100	DTW After Drilling (ft): 4.3	Screen Material: PVC
Driller: Rico Rodriguez	Top of Casing Elevation (ft): 223.7	Seal Material(s): Bentonite
Logged By: Ken Beal	Location (X, Y): 47.067653, -122.938828	Filter Pack: Monterey #2 sand



DEPTH (ft)	LITHOLOGY / WATER LEVEL / WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Sample ID	DEPTH (ft)
0					OL—Silty gravel (~50% gravel), grayish brown	0.4		0
					CH — Clean, dense clay, gray			
					CH/GC—Clay with gravel (50—60%), gray	0.4		
5								5
					CH—Clay, olive brown	0.3		
		Soil	1350		SW — Sand with gravel (20%) grading to clean medium grained, well sorted sand , greenish gray		B11-7	
						0.4		
10						0.4		10
						0.7		
15		Soil	1350			0.6	B11-15	15

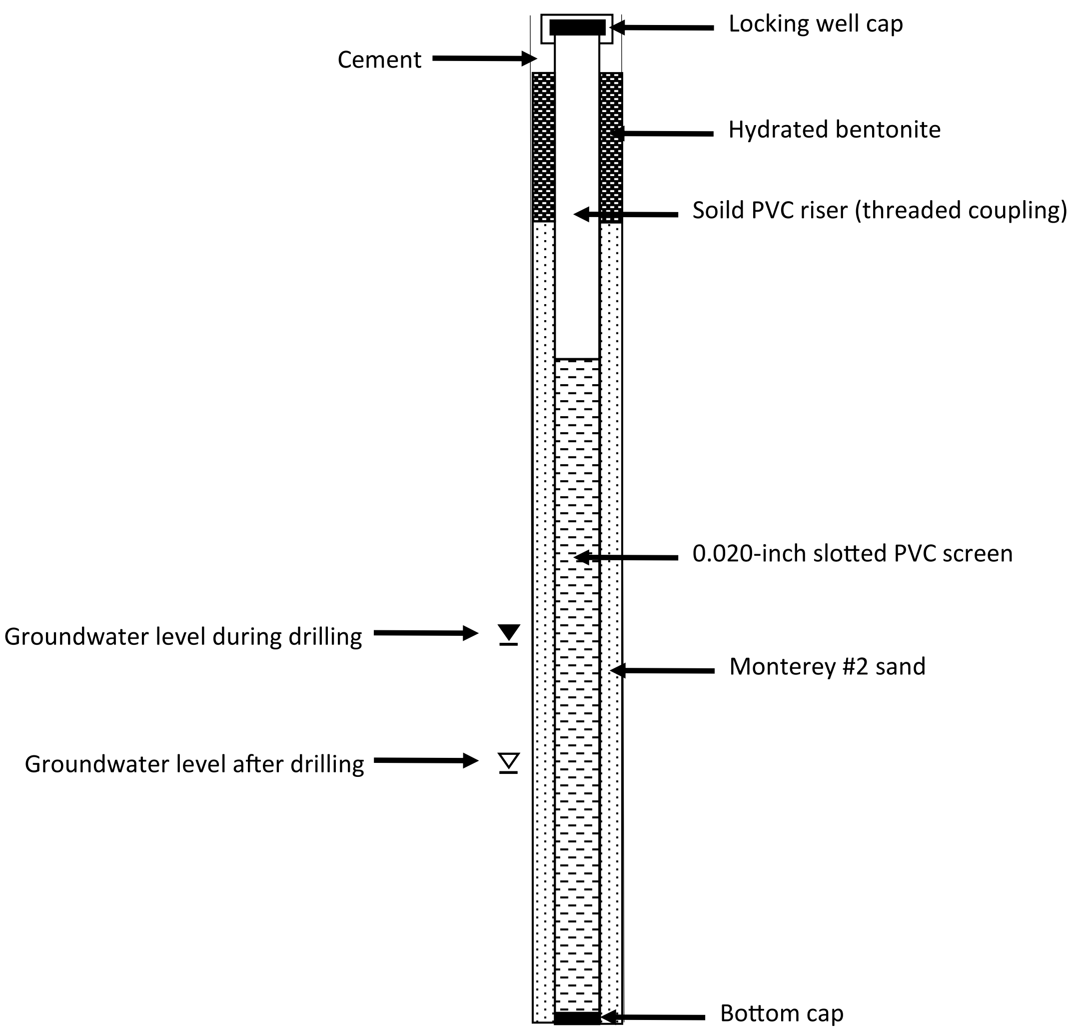
NOTES: Groundwater sample MW11-111420 collected 11/14/20 at 0830. Wellhead PID = 0.3 ppm and LEL = 0.0%.

UNIFIED SOIL CLASSIFICATION SYSTEM—ASTM D2488

GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
GM	Silty gravels, gravel-sand-silt mixtures
SW	Well-graded sands, gravelly sands, little or no fines
SP	Poorly graded sands, gravelly sands, little or no fines
SM	Silty sands, sand-silt mixtures
SC	Clayey sands, sand-clay mixtures

ML	Inorganic silts & very fine sands, silty or clayey sands
CL	Inorganic clays of low to medium plasticity, gravelly clays
OL	Organic silts and organic silty clays of low plasticity
CH	Inorganic clays of high plasticity, fat clays
OH	Organic clays of medium to high plasticity, organic silts
PT	Peat and other highly organic soils

MONITORING WELL DIAGRAM



Associated Environmental Group, LLC		
Client:	**AEG-CLIENTS**	**BORING LOG**
Project:	**21-142**	**Boring No.** **B-12**
Address:	**2200 Cooper Point Road SW, Olympia, WA**	**Page:** **1 of 1**

Drilling Start Date:	**06/24/2021 08:25**	Boring Depth (ft):	**15.0**
Drilling End Date:	**06/24/2021 09:01**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**11.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0				DP	08:32		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
										B12-3	
								(3.5') Poorly graded SAND with silt (SP-SM); mostly fine grained sand, trace fine-coarse gravel, few silt, dense, moist, dark bluish-gray			
5				DP	08:36		5.00				5
								(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray			
										B12-8	
10				DP	08:45		5.00				10
		∇									
										B12-12	
15								(15') Boring terminated			15
20											20

NOTES:

Associated Environmental Group, LLC

Client:	**AEG-CLIENTS**	**BORING LOG**	
Project:	**21-142**	**Boring No.**	**B-13**
Address:	**2200 Cooper Point Road SW, Olympia, WA**	**Page:**	**1 of 1**

Drilling Start Date:	**06/24/2021 09:11**	Boring Depth (ft):	**15.0**
Drilling End Date:	**06/24/2021 09:40**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**7.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0				DP	09:14		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
2.5								(2.5') Poorly graded SAND (SP); mostly fine-medium grained sand, trace silt, loose, dry, light bluish-gray			
4										B13-4	
5				DP	09:22		5.00				5
7		▽									
8										B13-8	
10				DP	09:30		5.00				10
14										B13-14	
15								(15') Boring terminated			15
20											20

NOTES:

Associated Environmental Group, LLC	Client:	AEG-CLIENTS	BORING LOG	
	Project:	21-142	Boring No.	B-14
	Address:	2200 Cooper Point Road SW, Olympia, WA	Page:	1 of 1

Drilling Start Date:	**06/24/2021 10:07**	Boring Depth (ft):	**15.0**
Drilling End Date:	**06/24/2021 10:31**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**10.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0	SP			DP	10:12		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
	SP-SM							(3.5') Poorly graded SAND with silt (SP-SM); mostly fine grained sand, trace fine-coarse gravel, few silt, dense, moist, dark bluish-gray		B13-4	
5				DP	10:14		5.00				5
	GP							(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray		B13-8	
10		▽		DP	10:21		5.00				10
	SW							(10.5') Well-graded SAND (SW); fine-coarse grained, medium dense, wet, light reddish-brown		B13-14	
15								(15') Boring terminated			15
20											20

NOTES:

	Client:	AEG-CLIENTS	BORING LOG	
Associated Environmental Group, LLC	Project:	21-142	Boring No.	B-15
	Address:	2200 Cooper Point Road SW, Olympia, WA	Page:	1 of 1

Drilling Start Date:	**06/24/2021 11:04**	Boring Depth (ft):	**15.0**
Drilling End Date:	**06/24/2021 11:31**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**12.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	Time	Blow Counts	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	Lab Sample	DEPTH (ft)
0				DP	11:08		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
								(3.5') Poorly graded SAND with silt (SP-SM); mostly fine grained sand, trace fine-coarse gravel, few silt, dense, moist, dark bluish-gray		B15-4	
5				DP	11:11		5.00				5
								(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray		B15-8	
10				DP	11:16		5.00				10
		▽ (12)						(10.5') Poorly graded SAND with gravel (SP); some fine-coarse grained sand, some fine-coarse gravel, dense, wet, light bluish-gray		B15-14	
15								(15') Boring terminated			15
20											20

NOTES:

Associated Environmental Group, LLC

Client:	**AEG-CLIENTS**	**BORING LOG**	
Project:	**21-142**	**Boring No.**	**B-16**
Address:	**2200 Cooper Point Road SW, Olympia, WA**	**Page:**	**1 of 1**

Drilling Start Date:	**06/24/2021 12:24**	Boring Depth (ft):	**15.0**
Drilling End Date:	**06/24/2021 12:55**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**13.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0	SP			DP	12:26		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
4										B16-4	
5				DP	12:31		5.00				5
6	GP							(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray			
8										B16-8	
10				DP	12:38		5.00				10
11	SP							(11') Poorly graded SAND (SP); fine-medium grained, medium dense, wet, light bluish-gray			
13		▽								B16-13	
15								(15') Boring terminated			15
20											20

NOTES:

Associated Environmental Group, LLC

Client:	**AEG-CLIENTS**	**BORING LOG**	
Project:	**21-142**	**Boring No.**	**B-17**
Address:	**2200 Cooper Point Road SW, Olympia, WA**	**Page:**	**1 of 1**

Drilling Start Date:	**06/24/2021 13:10**	Boring Depth (ft):	**15.0**
Drilling End Date:	**06/24/2021 13:40**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**8.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0				DP	13:19		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
										B17-4	
5				DP	13:21		5.00				5
								(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray			
		▽						(8') Poorly graded SAND (SP); fine-medium grained, medium dense, wet, light bluish-gray		B17-8	
10				DP	13:26		5.00				10
										B17-13	
15								(15') Boring terminated			15
20											20

NOTES:

Associated Environmental Group, LLC

Client:	**AEG-CLIENTS**	**BORING LOG**
Project:	**21-142**	**Boring No.** **B-18**
Address:	**2200 Cooper Point Road SW, Olympia, WA**	**Page:** **1 of 2**

Drilling Start Date:	**06/25/2021 06:35**	Boring Depth (ft):	**20.0**
Drilling End Date:	**06/25/2021 07:115**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**N/A**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0				DP	06:37		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
								(3.5') Poorly graded SAND with silt (SP-SM); mostly fine grained sand, trace fine-coarse gravel, few silt, dense, moist, dark bluish-gray		B18-4	
5				DP	06:44		5.00				5
								(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray		B18-8	
								(9') Poorly graded SAND (SP); fine-medium grained, trace silt, medium dense, moist, light reddish-brown			
10				DP	06:54		5.00			B18-13	10
15				DP	07:09		5.00	(15') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray			15
								(17.5') Poorly graded SAND (SP); fine-medium grained, trace silt, medium dense, moist, light reddish-brown		B18-18	
20											20

NOTES:

Associated Environmental Group, LLC	Client: AEG-CLIENTS	**BORING LOG**
	Project: 21-142	Boring No. B-18
	Address: 2200 Cooper Point Road SW, Olympia, WA	Page: 2 of 2

Drilling Start Date:	**06/25/2021 06:35**	Boring Depth (ft):	**20.0**
Drilling End Date:	**06/25/2021 07:115**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**N/A**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	Time	Blow Counts	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	Lab Sample	DEPTH (ft)
20								(20') Boring terminated			20
25											25
30											30
35											35
40											40

NOTES:

Associated Environmental Group, LLC	Client: AEG-CLIENTS	BORING LOG
	Project: 21-142	Boring No. B-19
	Address: 2200 Cooper Point Road SW, Olympia, WA	Page: 1 of 2

Drilling Start Date:	**06/25/2021 07:42**	Boring Depth (ft):	**20.0**
Drilling End Date:		Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**17.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	Time	Blow Counts	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	Lab Sample	DEPTH (ft)
0				DP	07:42		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
								(3.5') Poorly graded SAND with silt (SP-SM); mostly fine grained sand, trace fine-coarse gravel, few silt, dense, moist, dark bluish-gray		B19-5	
5				DP	06:44		5.00				5
								(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray		B19-10	
10				DP	07:55		5.00				10
										B19-15	
15				DP	08:07		5.00				15
		▽						(17') Poorly graded SAND (SP); coarse grained, loose, wet, light bluish-gray		B19-17	
20											20

NOTES:

Associated Environmental Group, LLC	Client: AEG-CLIENTS	BORING LOG
	Project: 21-142	Boring No. B-19
	Address: 2200 Cooper Point Road SW, Olympia, WA	Page: 2 of 2

Drilling Start Date:	**06/25/2021 07:42**	Boring Depth (ft):	**20.0**
Drilling End Date:		Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**17.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
20								(20') Boring terminated			20
25											25
30											30
35											35
40											40

NOTES:

Associated Environmental Group, LLC

Client:	AEG-CLIENTS
Project:	21-142
Address:	2200 Cooper Point Road SW, Olympia, WA

BORING LOG

Boring No. **B-20**

Drilling Start Date:	**06/25/2021 09:03**	Boring Depth (ft):	**15.0**
Drilling End Date:		Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**N/A**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0				DP	09:06		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
								(3.5') Poorly graded SAND with silt (SP-SM); mostly fine grained sand, trace fine-coarse gravel, few silt, dense, moist, dark bluish-gray		B20-5	
5				DP	09:13		5.00				5
								(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray			
								(9') Lean CLAY (CL); trace fine sand, mostly clay, medium plasticity, hard, moist, light bluish-gray		B20-10	
10				DP	09:24		0.60				10
										B20-15	
15								(15') Boring terminated			15
								(17') Poorly graded SAND (SP); coarse grained, loose, wet, light bluish-gray			
20											20

NOTES:

Associated Environmental Group, LLC	Client: AEG-CLIENTS	BORING LOG
	Project: 21-142	Boring No. B-21
	Address: 2200 Cooper Point Road SW, Olympia, WA	Page: 1 of 1

Drilling Start Date:	**06/25/2021 10:01**	Boring Depth (ft):	**15.0**
Drilling End Date:	**06/25/2021 10:20**	Boring Diameter (in):	**2.00**
Drilling Company:	**Cascade**	Sampling Method(s):	**Direct Push**
Drilling Method:	**Direct Push**	DTW During Drilling (ft):	**10.0**
Drilling Equipment:	**Track Mounted Geoprobe**	DTW After Drilling (ft):	**N/A**
Driller:	**Tim**	Ground Surface Elev. (ft):	
Logged By:	**B. Dilba**	Location (Lat, Long):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	Time	Blow Counts	Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	Lab Sample	DEPTH (ft)
0	SP			DP	10:04		4.00	(0') Poorly graded SAND with gravel (SP); mostly fine-coarse grained sand, little fine-coarse gravel, trace silt, medium dense, moist, light brown			0
	SP-SM							(3.5') Poorly graded SAND with silt (SP-SM); mostly fine grained sand, trace fine-coarse gravel, few silt, dense, moist, dark bluish-gray		B21-5	
5				DP	10:07		5.00				5
	GP							(6') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray			
	SP							(9') Poorly graded SAND (SP); fine-medium grained, trace silt, medium dense, moist, light reddish-brown		B21-10	
10		▽		DP	10:12		5.00				10
										B21-15	
15	GP							(15') Boring terminated (15') Poorly graded GRAVEL with sand (GP); mostly fine-coarse grained gravel, some fine-coarse sand, dense, moist, light bluish-gray			15
								(17.5') Poorly graded SAND (SP); fine-medium grained, trace silt, medium dense, moist, light reddish-brown			
20											20

NOTES:

APPENDIX C

Initial Draft RI Report
ENPRO 2021

(Available separately from Washington State Department of Ecology)

APPENDIX D

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons, and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project, or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current loc al., state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.