

FOCUSED SITE ASSESSMENT REPORT

CASCADES BUSINESS PARK
CASCADE DRIVE
NORTH BONNEVILLE, WASHINGTON



Prepared for
PORT OF SKAMANIA COUNTY
May 5, 2022
Project No. M0350.04.001

Prepared by
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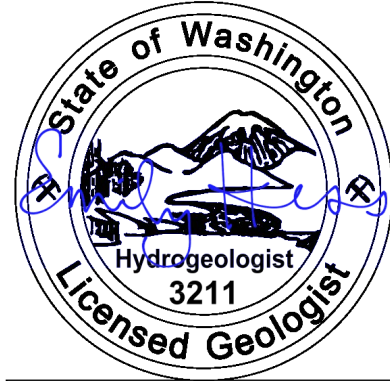
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*The material and data in this report were prepared
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ACRONYMS AND ABBREVIATIONS

95 UCL	95 percent upper confidence limit of the population mean
AOC	area of concern
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSM	conceptual site model
CUL	cleanup level
DEQ	Oregon Department of Environmental Quality
DRO	diesel-range organics
DU	decision unit
E.P. Johnson	E.P. Johnson Construction & Environmental, Inc.
EBS	environmental baseline survey
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FSA	focused site assessment
HRO	heavy-oil-range organics
ISM	incremental sampling methodology
MFA	Maul Foster & Alongi, Inc.
mg/kg	milligrams per kilogram
MTCA	Model Toxics Control Act
NFA	no further action
NPL	National Priorities List
NWTPH	Northwest Total Petroleum Hydrocarbons
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCS	petroleum contaminated soil
PID	photoionization detector
the Port	Port of Skamania County
ppm	parts per million
the Property	Cascades Business Park in North Bonneville, Washington
PVC	polyvinyl chloride
Second Powerhouse	Bonneville Lock and Dam Second Powerhouse
TEC	toxicity equivalent concentration
TEF	toxic equivalence factor
TEQ	toxic equivalency
TPH	total petroleum hydrocarbons
ug/L	micrograms per liter
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

ACRONYMS AND ABBREVIATIONS (CONTINUED)

WAC	Washington Administrative Code
Woodward-Clyde	Woodward-Clyde Group Inc.

1 INTRODUCTION

Maul Foster & Alongi, Inc. (MFA), has prepared this focused site assessment (FSA) report for the Port of Skamania County (the Port). The report describes the field activities and results of the FSA conducted at the Cascades Business Park site located in North Bonneville, Washington (the Property) (see Figure 1-1).

1.1 Regulatory Framework

The Port received an Integrated Planning Grant from the Washington State Department of Ecology (Ecology). The grant supports the Port's environmental site assessment, analysis of cleanup alternatives, and site planning for redevelopment of the Property to support economic development opportunities in the community (the Port and the City of North Bonneville intend to develop the Property as an industrial business park). The FSA was conducted in general accordance with guidance put forth in the Model Toxics Control Act (MTCA) (Revised Code of Washington 70.105d) and its implementing regulations (Washington Administrative Code [WAC] 173-340).

1.2 Purpose and Objectives

The purpose of the FSA was to evaluate the potential presence of environmental impacts at selected areas of concern (AOCs) and generate data sufficient for evaluating the nature of potential impacts and developing potential cleanup actions. The AOCs are discussed in detail in Section 2. Data generated by the FSA will support risk screening and evaluation of potential supplemental property characterization (if necessary) and cleanup actions (as applicable). The results of the FSA are intended to support the following project objectives:

- Characterization of the presence of potentially hazardous substances in environmental media to identify whether contamination is present and whether concentrations are above MTCA cleanup levels (CULs).
- Develop a preliminary conceptual site model (CSM) for the Property.
- Evaluate the potential risks to current and reasonably likely future human and ecological receptors.
- Evaluate the potential cleanup options for impacted environmental media identified at the Property.

1.3 Property Description

The Property is located in section 20, township 2 north, range 7 east of the Willamette Meridian on Skamania County parcel number 02072000020500 (see Figures 1-1 and 1-2). According to the

Skamania County Assessor's website,¹ the approximately 42-acre Property is currently zoned 67-Services- Governmental, but the Port's website reports the Property as zoned industrial.²

A telecommunications tower facility was constructed on the northeast portion of the Property in 2021. The remainder of the Property is vacant and undeveloped, with large piles of concrete rubble and boulders throughout the Property.

1.4 Geology and Hydrogeology

The western half of the Property comprises a large hill, and the topography slopes down in all directions from this hill. In general, the Property slopes south-southeast toward the Columbia River. The current elevation at the Property varies from approximately 45 feet above mean sea level near the northwest corner (near Cascade Drive) up to approximately 103 feet above mean sea level near the central western portion of the Property.

The Property is located on an alluvial terrace approximately 550 to 1,000 feet northwest of the Columbia River (proximity to the river varies along the southern Property boundary). The Property is located along the intersection of the Cascade Range uplift region and the Columbia River Gorge, a region characterized by deeply dissected mountains that have been incised by the Columbia River and associated tributaries. Much of the Property was covered by 25 to 60 feet of fill material derived from Columbia River dredge spoils deposited in the early 1980s.

A drainage channel located near the western and northwestern perimeter of the Property collects water (e.g., perched groundwater) that seeps out of the ridge on the northwest and western sides of the Property. Groundwater levels at the Property are expected to be variable and subject to influence from the Columbia River and seasonal variance. Seeps and springs drain from the ridge into natural or engineered drainage features at the Property. Groundwater is expected to be encountered below original ground surface, which varies based on the topography and fill placement at the Property.

1.5 Property History

According to historical documentation and interviews, the Property was used predominantly as grazing land until it was purchased by the U.S. Army Corps of Engineers (USACE) in the mid-1970s and cleared of vegetation. During construction of the Bonneville Lock and Dam Second Powerhouse (Second Powerhouse) from approximately 1976 to 1982, contractors used the Property (under ownership of the USACE) for the storage, washing, maintenance, and staging of construction equipment. In addition, the Property was used as a disposal area for more than 1 million cubic yards of excavated materials (i.e., dredge spoils excavated from the widening of the northernmost channel of the Columbia River, concrete rubble from the temporary cofferdams, and various construction

¹ Skamania County, Washington. TaxSifter, Parcel No. 02072000020500. <https://skamaniawa-taxsifter.publicaccessnow.com/Search/Results.aspx>. Accessed on March 28, 2022.

² Port of Skamania County. Our North Bonneville Properties. <https://portofskamania.org/our-properties/north-bonneville-properties/> Accessed on March 28, 2022.

debris from the construction of the Second Powerhouse) in 1980, 1981, and 1982 (Squier Associates, 2000).

The Property is listed in Ecology's cleanup site database as Cleanup Site ID 736 (cleanup site name US Army COE Hamilton is Parcel 2). Based on investigations conducted in the 1990s, petroleum products were remediated in soil and groundwater. The Property is listed because cleanup started through the standard voluntary cleanup program, project ID no. SW1740.

Between 1992 and 1994, the USACE investigated potential contamination caused by leaks and spills during the Property's prior use as a contractor staging and vehicle maintenance area. Petroleum contaminated soil (PCS) was discovered and removed. In 1997, Ecology reviewed the USACE's remedial investigations and cleanup actions and determined that conditions stemming from past USACE activities at the Property did not require further action, with the exception of two localized areas requiring a deed restriction and monitoring because of remaining PCS. In 1998, a restrictive covenant was prepared for the two localized areas (Sites 1 and 2; see Figure 1-2) specified in Ecology's no further action (NFA) determination, and the USACE conveyed the Property to the City of North Bonneville. In November 2000, the City of North Bonneville conveyed the Property to the Port.

1.6 Previous Investigations

MFA was provided the following historical environmental reports for the Property:

Environmental Baseline Study—Woodward-Clyde (November 1993). In June 1993, Woodward-Clyde Group Inc. (Woodward-Clyde) conducted an environmental baseline survey (EBS) to determine whether the Property sustained impacts from the USACE's construction activities (Woodward-Clyde, 1993). The survey identified several areas of potential concern in former operations areas: an area of apparent debris disposal, a former outbuilding (i.e., a shed), two former fuel farms, a surface spill area, four former maintenance buildings (including the remnants of a concrete pad under the former location of one of the shops), a former oil change area, a former wash rack, and a former drum storage area.

Site Characterization Report—E.P. Johnson (November 1994). E.P. Johnson Construction & Environmental, Inc. (E.P. Johnson) prepared a site characterization report of the Property for the USACE. E.P. Johnson was contracted by the USACE to dispose of PCS at the Property caused by leaks and spills during its prior use as a contractor staging and vehicle maintenance area associated with the construction of the Second Powerhouse. The objective of the cleanup was to restore the Property to a condition consistent with Ecology's requirements and to prepare the Property for real estate transfer.

The Property was initially investigated as part of the USACE's 1990 inspection of the nearby Hamilton Island site. At that time, Hamilton Island was included on the National Priorities List (NPL), but the boundaries of the site had not yet been defined.³ The EBS was conducted to determine whether

³ The National Priorities List is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is

contamination from construction activities existed at the Property. Based on the results of the site inspection and the EBS, EPA and Ecology determined that the Property would not be considered a part of the nearby Hamilton Island NPL site, but that several areas at the Property exhibited contamination sufficient to require cleanup under MTCA.

Woodward-Clyde, the consultant conducting the EBS, collected soil samples from several areas of potential concern in former operations areas and discovered PCS throughout the Property at various depths. PCS was discovered in a trench excavated immediately adjacent to the east side of an existing concrete slab foundation of a former equipment maintenance building that was determined to have been caused by a broken pipe from floor drains in the slab. The highest level of total petroleum hydrocarbons (TPH) contamination was detected in soils in the trench directly adjacent to the broken pipe at a concentration of 820 parts per million (ppm) at a depth of 2 feet below ground surface (bgs), but according to the report, volatiles and metals detected in the soils were not significantly elevated. It should be noted that no analytical data regarding volatiles or metals were presented in E.P. Johnson's report; MFA could verify only that soil samples collected at the Property had been analyzed for TPH. In the Former Wash Rack Area (an area east of the concrete slab building foundation formerly used to wash construction equipment), three test pits were excavated. The highest detected concentration of TPH (as diesel) was 250 ppm, in a sample collected approximately 3 feet bgs in notably discolored soil (again, E.P. Johnson reported that volatiles and metals were not significantly elevated, but MFA could not verify this statement). According to the E.P. Johnson report, the contaminated area sampled in the Former Wash Rack Area appeared to be covered by approximately 2 feet of visibly clean soil. The PCS discovered in the two areas with TPH detections above 200 ppm required remediation.

Two other areas of PCS with TPH concentrations above 200 ppm were discovered near the Former Maintenance Building #1 and the Former Fuel Farm along the southern central Property boundary. TPH was detected at a concentration of 1,200 ppm at 10 to 15 feet bgs near the former maintenance buildings and at a concentration of 230 ppm at 26 to 28 feet bgs near the Former Fuel Farm. As stated in the report, contaminated soils remained in place in these two areas; it was determined that there was adequate soil cover over the contamination and that the excavation of such deep soils was impractical and would not significantly reduce risk to human health and the environment (E.P. Johnson, 1994).

Ecology's Petroleum Contaminated Soils Rating Matrix was used to calculate the CULs for the Property: 800 ppm TPH (as diesel) for paved areas and 600 ppm for unpaved areas. In May 1994, E.P. Johnson excavated approximately 350 cubic yards of PCS from the Former Maintenance Building #2 area. Samples collected from the contaminated soils excavated in these areas contained levels of heavy-oil TPH ranging from approximately 500 to 1,000 ppm. One sample collected approximately 8 feet east of the broken pipe in Trench #3 contained 16,000 ppm of heavy-oil TPH. Soils were excavated until confirmation soil samples collected from the excavation sidewalls and floors were below the Petroleum Contaminated Soils Rating Matrix CUL. The excavation at Trench #3 was terminated at approximately 2 feet bgs, and confirmation samples indicated that the 800-ppm CUL had been satisfied. The excavated PCS was removed from the Property, transported to Thermal Process

intended primarily to guide the U.S. Environmental Protections Agency (EPA) in determining which sites warrant further investigation.

Systems Technologies in Portland, Oregon, and treated by thermal desorption at their facility. After successful treatment, the soil was returned to the Property and used to backfill the excavation.

No Further Action Letter—Ecology (June 1997). Ecology issued an NFA determination for the Property on June 16, 1997. Ecology reviewed the following environmental reports prepared for the Property: Parcels 2 and C field investigation report prepared by Woodward-Clyde in 1992 (Woodward-Clyde, 1992), the Parcels 2 and C EBS prepared by Woodward-Clyde in 1993 (Woodward-Clyde, 1993), and the revised final report of PCS remediation at Parcel 2 and Hamilton Island prepared by E.P. Johnson in 1994 (E.P. Johnson, 1994). Based on a site visit and the information provided in these reports, Ecology issued a determination that conditions caused by past USACE activities at the Property did not require further action, except in two localized areas (Sites 1 and 2), which would involve a deed restriction and monitoring requirements. It was determined that contaminants found during these investigations either had been properly remediated or did not pose a risk to human health or the environment, except at Sites 1 and 2. Compliance monitoring was required to confirm that human health and the environment were adequately protected, and inspection of the two localized areas was required to determine the effectiveness of the existing soil cover to ensure that erosion or other unwanted exposure of contaminants had not occurred. Ecology's NFA determination was also contingent on filing a restrictive covenant with the Skamania County Auditor's Office (Ecology, 1997).

Quitclaim Deed/Restrictive Covenant—USACE (June 1998). A quitclaim deed and restrictive covenant were prepared for the transfer of the Property from the USACE to the City of North Bonneville and recorded on June 2, 1998. Contaminated soil remained at Sites 1 and 2; Ecology had determined that additional excavation was impractical and would not significantly reduce the risk to human health or the environment. The remaining contaminants in these two locations are located beneath a former building foundation and fill mounds, reducing the potential for human exposure and the potential risk to human health. MTCA stipulates as follows:

[a] remedy that leaves hazardous substances on a site in excess of cleanup levels may qualify as a cleanup action as long as the remedy is protective of human health and the environment, meets clean up levels at specified points of compliance, complies with applicable state and federal laws, provides for adequate monitoring, and incorporates appropriate institutional controls.

The remediation at the Property met these requirements and received an NFA letter from Ecology (Ecology, 1997). The restrictive covenant applies exclusively to two restricted areas at the Property, Site 1 (known as the Former Wash Rack Area) and Site 2 (near the Former Maintenance Building #1). Site 1 is located in the eastern portion of the Property, just east of the existing concrete floor slab. A CUL of 800 ppm TPH was achieved and approved for this location. Site 2 is a 10-foot-radius circle located at the Former Maintenance Building #1. Cleanup was accomplished to 600 ppm TPH.

The restrictive covenant makes the following declarations (City of North Bonneville, 1998):

- Any activity that may result in the release or exposure of contaminated soil that remains under 4 feet of clean cap soil at the Site 1 or under 9 feet of clean cap soil at the Site 2, or creates a new exposure (e.g., drilling, digging, bulldozing, earthwork, or grading deeper than the clean cap), is prohibited. Any activities that may interfere with the integrity of the

clean soil containment or the protection of human health and the environment are prohibited.

- Compliance monitoring of the two restricted areas by the owner is required to confirm that human health and the environment are protected, and annual inspection is required to determine the effectiveness of the containment to ensure that erosion or other unwanted exposure has not occurred. Review of the effectiveness of the remedial action is required five years after the remedial action has been initiated and after a minimum of compliance monitoring events have been completed.
- The owner must give 30-day advanced notice to Ecology for any conveyance of Site 1 or Site 2.
- The owner must restrict leases to uses and activities consistent with the restrictive covenant or obtain approval from Ecology prior to any activities inconsistent with the covenant.
- The owner shall allow Ecology to enter Site 1 or Site 2 with prior notice.
- With the consent of Ecology and after public notice and comment, the owner may record an instrument that provides that the restrictive covenant shall no longer limit use of the two areas or be of any further force or effect.

Site Geologic Characterization Report—Squier Associates (August 2000). The Port and the City of North Bonneville intended to develop the Property into an industrial business park once the USACE conveyed the Property to the city. In August 2000, Squier Associates prepared a preliminary geologic site characterization report based solely on information previously prepared for the Property (Squier Associates, 2000). The goal of this report was to provide the business park design team with initial findings regarding the likely types of fill material present at the Property. Squier Associates reportedly reviewed published and unpublished data and studied historical aerial photographs to characterize the likely nature and distribution of fill materials placed on the Property during the construction of the Second Powerhouse.

The Property was in extensive use between April 1978 and September 1981 for construction of the Second Powerhouse as well as for the contractors' equipment-related use, as the Bonneville Lock and Dam began operation in April 1982. Two contractors built and operated equipment maintenance shops and fueling yards at the Property. Excavation spoils dredged from the northernmost channel of the Columbia River were placed on the Property during later phases of construction. The entire project involved the excavation and disposal of 23 million cubic yards of excavation spoils, most of which was placed on Hamilton Island. More than 1 million cubic yards of excavation spoils and some construction debris was disposed of at the Property.

Soil Sampling—Martin Environmental Solutions Inc. (April 2021). Soil was sampled by Martin Environmental Solutions Inc. in April 2021 for a proposed telecommunications tower facility on the northeast portion of the Property. Six borings were advanced using a hand auger to a maximum of 6 feet bgs. Two soil samples were collected from the proposed tower location, at 3 and 6 feet bgs. One soil sample was collected from each of the remaining five borings in the proposed lease area and the access road at 3 feet bgs. The soil samples were analyzed for diesel- and heavy-oil-range TPH. Diesel-range organics (DRO) were detected at the 3-foot depth in three borings, with the highest

concentration of 342 milligrams per kilogram (mg/kg), below the MTCA Method A soil CUL for unrestricted land use of 2,000 mg/kg. Heavy-oil-range organics (HRO) were not detected in any of the soil samples (Martin Environmental Solutions Inc., 2021).

Further Action Letter—Ecology (August 2021). Ecology issued a further action letter on August 17, 2021, stating that additional reporting and evaluation were needed for the site before Ecology would concur with closure of the site without a restrictive covenant (Ecology, 2021). In the letter, Ecology notes that the soil sample analysis completed by Martin Environmental Solutions Inc. did not meet the requirements of Table 830-1 and that the analytical laboratory used did not appear to be a Washington-accredited laboratory. Ecology is requesting confirmation of the conditions that remain at the two sites identified in the 1997 covenant as restricted. Per Table 830-1, because the chemical of concern (COC) is DRO, analyses for the restricted area should include DRO and HRO; benzene, toluene, ethylbenzene, and total xylenes (BTEX); carcinogenic polycyclic aromatic hydrocarbons (cPAHs); and naphthalenes. In addition, a terrestrial ecological evaluation will have to be completed in accordance with WAC 173-340-7490 through 7494.

2 AREAS OF CONCERN

This section discusses known and suspected areas of contamination at the Property, based on identified features of interest associated with historical operations, areas of contamination identified during previous sampling activities, and the nature and extent of COCs.

AOCs have been identified based on activities, conveyances, and physical features associated with former operations that may have resulted in a release of hazardous substances to environmental media at the Property (see Figures 2-1, 2-2, and 2-3).

2.1 AOC 1: Site 1—Former Wash Rack Area

The Former Wash Rack Area is an AOC (see Figure 2-1), based on PCS left in place following remedial activities conducted in the 1990s. It is identified in the restrictive covenant as Site 1.

2.2 AOC 2: Site 2—Former Maintenance Building #1

The Former Maintenance Building #1 is an AOC (see Figure 2-2), based on PCS left in place following remedial activities conducted in the 1990s. It is identified in the restrictive covenant as Site 2.

2.3 AOC 3: Fill Material

The Property was used as a disposal area for more than 1 million cubic yards of excavated materials (i.e., dredge spoils from the widening of the northernmost channel in the Columbia River, concrete rubble from the temporary cofferdams, and debris from the construction of the Second Powerhouse) in 1980, 1981, and 1982 (Squier Associates, 2000). A review of Oregon Department of Environmental

Quality (DEQ) files on the Bradford Island cleanup site⁴ and an interview with Robert Schwarz, the DEQ project manager for the Bradford Island cleanup site, revealed that river sediments near the island were contaminated with polychlorinated biphenyls (PCBs) caused by leaching from the Bradford Island landfill (which operated from the 1940s through the early 1980s) and the USACE's dumping of PCB-containing electrical components into the river around Bradford Island. MFA's file review and interview with Robert Schwarz confirmed there is potential that the sediments that received Bradford Island landfill materials and PCB-containing electrical components were later dredged and placed onto the western two-thirds of the Property. Based on the placement of potentially contaminated river sediments onto the Property and the known or suspected presence of buried debris (i.e., buried asphalt, treated wood, scrap metal, containers) at the Property, the fill material is considered an AOC (see Figure 2-3).

According to the fact sheet prepared for the proposal to list Bradford Island on the NPL, PCBs and heavy metals were discovered in sediment around Bradford Island. Contamination in soils on the upland portion of Bradford Island includes PCBs, polycyclic aromatic hydrocarbons (PAHs), and heavy metals (EPA, 2021). In March 2022, the EPA added Bradford Island as a Superfund Site on the NPL (EPA, 2022).

2.3.1 Fill Material—Area of Greatest Thickness

A large hill comprising 25 to 60 feet of fill material is present on the western portion of the Property.

2.3.2 Fill Material—Northern Decision Unit

Shallow soil in the fill is likely to be disturbed during mass grading activities conducted during the construction phase of redevelopment in the northern area (see Figure 2-3). Based on preliminary designs, mass grading activities in the northern decision unit (DU) are anticipated to reach a maximum depth of 7 feet.

2.3.3 Fill Material—Southern Decision Unit

Shallow soil in the fill is likely to be disturbed during mass grading activities conducted during the construction phase of redevelopment in the southern area (see Figure 2-3). Based on preliminary designs, mass grading activities in the southern DU are anticipated to reach a maximum depth of 10 feet.

3 FIELD AND ANALYTICAL METHODS

The FSA field investigation was conducted in general accordance with the methods and protocols described in the work plan (MFA, 2021). Standard field operating procedures for collecting soil

⁴ Bradford Island is an island in the Columbia River at Bonneville Dam between the spillway and the first powerhouse that is approximately 0.4 mile to the east of the Property.

samples, scheduling analyses, decontaminating equipment, and managing waste are described in the sampling and analysis plan, included as Appendix A of the work plan. Before test pitting and drilling began, public and private underground utility locating services checked for underground utilities.

On February 9 and 10, 2021, MFA conducted the FSA subsurface investigation to identify the potential or residual impacts to environmental media at each of the AOCs described in Section 2. Reconnaissance borings were advanced for the collection of environmental soil and groundwater samples by Pacific Soil and Water, LLC, using push-probe methods. Hart Crowser, Inc., conducted a geotechnical assessment concurrently with the FSA subsurface investigation, which consisted of drilling and test-pitting activities. The geotechnical borings were advanced by Holt Services, Inc., using a sonic drill rig. The test pits were advanced by Dan J. Fischer Excavating, Inc., using a Case 580 Super N Backhoe Loader. Willamette Cultural Resources Associates, Ltd., was also on site to observe soils in each test pit and boring, in the event of a discovery of archaeological materials or human remains, in accordance with the Inadvertent Discovery Plan (included as Appendix C of the work plan).

Some of the boring locations proposed in the work plan were moved five to ten feet in the field due to subsurface obstructions (e.g., from encountering refusal during drilling). Eight of the proposed boring locations (four from each DU; B10, B11, B15, B16, B18, B20, B21, B25) were combined with geotechnical test pitting locations for efficiency. Per the work plan, there was a boring (B27) located on the far southwestern portion of the Property. This area of the Property is much lower in elevation compared to the western portion of the Property, as shown in Figure 2 of Appendix B. The topography of this area indicated there was limited fill placed at this location and therefore this boring was not advanced. This soil sample was instead collected from geotechnical boring location (B7). The locations of each boring and test pit are shown in Figure 2-3.

The elements of the investigation are described in the following sections.

3.1 Soil

Reconnaissance soil samples were collected to evaluate the potential for COCs. Soil characteristics and visual or olfactory observations were recorded on soil boring logs (included as Appendix A) and test pit logs (see Appendix C of Appendix B). A photoionization detector (PID) was used to assess soil samples from the borings and test pits for the presence of volatile organic compounds (VOCs).

Soil samples were collected from each AOC in the three investigation focus areas, as described below.

3.1.1 Restrictive Covenant Shallow Soils

Using push-probe technology, four reconnaissance borings were advanced in restricted area Site 1/Former Wash Rack Area (B1 through B4 in AOC 1; see Figure 2-1) and one boring was advanced in restricted area Site 2/Former Maintenance Building #1 (B5 in AOC 2; see Figure 2-2). Per the restrictive covenant at the Property, four feet of clean cap soil is present at Site 1 and nine feet of clean cap soil is present at Site 2; the borings were advanced to 10 feet bgs in Site 1 and to 14 feet bgs in Site 2 to evaluate soils in and below the clean cap. Three attempts were made at boring location B5 to drill to 15 feet bgs (i.e., the depth proposed in the work plan), but refusal was encountered at 9, 12, and 14 feet bgs due to rocky obstructions in the subsurface.

Continuous soil cores were retrieved from each of the five borings for observation and screening; depth intervals were screened using a PID for the potential presence of VOCs commonly associated with petroleum fuel products. There was no visual or olfactory evidence of contamination, and organic vapors were not present.

Consistent with the work plan, three discrete soil samples were collected from each of the restricted area Site 1 borings (B1 through B4) from the following target depths: 0 to 4 feet bgs, 4 to 7 feet bgs, and 7 to 10 feet bgs. Four discrete soil samples were collected from the restricted area Site 2 boring (B5) from the following target depths: 0 to 5 feet bgs, 5 to 9 feet bgs, 9 to 12 feet bgs, and 12 to 14 feet bgs. Subsurface soil in these boring generally consisted of grayish brown, silty gravels and sandy or gravelly silts with trace gray cobbles, underlain by yellowish brown, silty sands with trace wood debris.

MFA used a tiered approach to analyze soil at the laboratory and not all samples collected were submitted for analysis; one sample collected from below the clean cap from each boring was selected for analysis and the remaining samples collected were placed on hold. If the submitted sample from a boring indicated an elevated result for COCs, additional archived soil samples were to be selected for analysis to delineate the vertical extent of contamination. Because evidence of contamination was not observed in any of the borings located in the restricted areas, the samples submitted for analysis were collected from a variety of depths below the clean cap. The soil samples submitted for analysis from B1 through B5 were analyzed for the following COCs:

- DRO and HRO by Northwest TPH (NWTPH)-Dx Method
- PAHs by EPA Method 8270E selected ion monitoring
- BTEX by EPA Method 5035A/8260D
- Total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA Method 6020B

3.1.2 Deep Fill Material

Using sonic drilling technology, two geotechnical borings were advanced to 51.5 feet (B6) and 36.5 feet (B7), the depth at which native soil was encountered. These locations were targeted for the areas where fill material was anticipated to be the thickest (see Figure 2-3). MFA collected soil samples from these borings to evaluate the deeper fill material present in AOC 3. Continuous soil cores were retrieved for observation and screening; depth intervals were screened using a PID for the potential presence of VOCs commonly associated with petroleum fuel products. After field observations were recorded, soil samples were collected from the borings from the following target depth intervals: 10 to 15 feet bgs, 20 to 25 feet bgs, 30 to 35 feet bgs, 40 to 45 feet bgs, and 45 to 50 feet bgs. There was no visual or olfactory evidence of contamination nor were organic vapors present.

Each soil sample collected from B6 and B7 was submitted for analysis and analyzed for the following COCs:

- DRO and HRO by NWTPH-Dx Method

- PAHs by EPA Method 8270E selected ion monitoring
- PCBs by EPA Method 8082A
- Total metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA Method 6020B
- BTEX by EPA Method 5035A/8260D

3.1.3 Shallow Fill Material

Preliminary redevelopment designs indicate that mass grading activities at the Property will result in disturbance of soil to a maximum of 7 feet bgs in the northern portion of the Property (i.e., the northern DU) and to a maximum of 10 feet bgs in the southern portion of the Property (i.e., the southern DU).

Soil samples were collected from ten locations in each DU to evaluate the shallower fill material in AOC 3; six borings (locations denoted with a B) were advanced to 10 feet bgs using push-probe technology and four test pits (locations denoted with TP) were completed to at least 10 feet bgs using an excavator in each DU (see sampling location names and locations in Figure 2-3). Continuous soil cores were retrieved from the push-probe for observation and screening. Discrete soil samples were collected from the excavation sidewalls of the test pits for observation and screening. The soil headspace readings from the test pit excavations had a PID readings of 0.0 ppm. There was no visual or olfactory evidence of contamination nor were organic vapors present in the test pits.

Incremental sampling methodology (ISM) characterizes the average concentration of constituents in a predefined area, the DU. ISM provides data that are more representative of average concentrations than area-wide concentrations derived from discrete or traditional composite samples (ITRC, 2020). Shallow fill material soil (i.e., less than 10 feet bgs) from the northern and southern DUs were assessed using modified ISM procedures⁵ to collect a representative sample from each of these areas. Samples (called increments) were collected at target depths from the ten sample locations in each DU. The increments were collected, prepared, and processed by the laboratory consistent with the methods and procedures described in the work plan. Methods for collecting increments from the test pits (a deviation from the work plan) were as follows: the excavator advanced the test pit to the desired depth for the geotechnical assessment. Using the bucket, the excavator scraped the excavation sidewall from the surface to 5 feet bgs, and then from 5 to 10 feet bgs. The bucket of soil generated from each depth interval was emptied onto the ground surface and from that, an increment of soil comprising several points within the pile was collected, avoiding soil that had direct contact with the excavator bucket.

Composite soil samples were collected from the ten sampling locations in each DU from the following specified depths: surface to 5 feet bgs and from 5 to 10 feet bgs. The ISM samples were analyzed for the following COCs:

⁵ ISM procedures outlined in the ITRC guidance document were generally followed; however, increments were collected from ten locations, not the 30 to 100 locations in the guidance (ITRC, 2020).

- DRO and HRO by NWTPH-Dx Method
- PAHs by EPA Method 8270E selected ion monitoring
- PCBs by EPA Method 8082A
- Total metals by EPA Method 6020B

In boring location B14, MFA observed a slight petroleum-like odor in soils from approximately 8.5 to 10 feet bgs (though no sheen was observed and PID readings were low). MFA collected a discrete sample from this boring at 9.5 feet bgs (where indications of potential contamination were the strongest) as well as a sample from 7 feet bgs (from soils with no indication of contamination located directly above the area of impacts) and submitted these two samples to be analyzed for DRO, HRO, PAHs, PCBs, BTEX, and total metals.

3.2 Groundwater

Reconnaissance groundwater samples were collected from borings B6 and B7 to evaluate the potential for COCs. Per Ecology's request following its review of the work plan, MFA also made attempts to collect perched groundwater when saturated soil was encountered in reconnaissance borings B5 and B14. However, water was not encountered in sufficient quantity to enable purging and groundwater sample collection in these shallow borings. Although saturated soil was not encountered at B4, a temporary well was also installed at this location to verify that soil conditions at Site 1 did not generate perched groundwater in the upper ten feet of soil. Groundwater was encountered at B6 and B7; temporary wells were installed, and groundwater sampling was conducted using the methods and protocol outlined in the work plan. Appendix C includes field sampling data sheets detailing groundwater sampling activities.

At boring B6, saturated soil was encountered in the soil core intermittently from 7.5 to 42.0 feet bgs during drilling activities and stabilized at approximately 40 feet bgs upon installation of a temporary well in the boring. The temporary well was constructed of 2-inch-diameter schedule 40 polyvinyl chloride (PVC) casing and screened with a 0.01 slot, prepacked, schedule 40 PVC screen from 40 to 50 feet bgs. Groundwater was purged using a disposable bailer because the depth to groundwater at this location was deeper than the capability of a peristaltic pump to purge groundwater below approximately 27 feet bgs.

At boring B7, saturated soil was encountered in the soil core intermittently from 5 to 36.5 feet bgs during drilling activities and stabilized at approximately 1.1 feet bgs upon installation of a temporary well in the boring. The temporary well was constructed of 2-inch-diameter schedule 40 PVC casing and screened with a 0.01 slot, prepacked, schedule 40 PVC screen from 15 to 35 feet bgs. Groundwater was purged using a peristaltic pump.

A water quality meter and turbidity meter were used at both locations to record water quality parameters. A groundwater sample was collected when the field parameters had stabilized. Turbidity in both borings was over range for the meter, and turbidity did not clear up during purging. See photographs in Appendix D for groundwater turbidity conditions encountered at B6 during purging and sampling. Significant sediment was observed to settle in all sample bottles, including the bottle

that containing groundwater filtered in the field using a 0.45-micron filter that would be analyzed by the laboratory for dissolved metals.

Groundwater samples were submitted for the following laboratory analyses:

- DRO and HRO by NWTPH-Dx Method
- PAHs by EPA Method 8270E selected ion monitoring
- PCBs by EPA Method 8082A
- Total and dissolved metals by EPA Method 6020B (dissolved metals were field filtered using a disposable 0.45-micron filter)
- BTEX by EPA Method 8260D

3.3 Archaeological Monitoring

During ground-disturbing activities, an archaeologist with Willamette Cultural Resources Associates, Ltd., was on site to observe soils in each test pit and boring. As requested by Ecology, archaeological monitoring was conducted to observe and document cultural resources that may have been exposed during all ground-disturbing activities. The monitoring report prepared by Willamette Cultural Resources Associates, Ltd., is included in Appendix E.

In summary, no cultural resources were identified during geotechnical drilling and test pit monitoring. Nearly all the soil observed was fill and dredge material that was placed at the Property in 1981. The exception was the potential presence of native sediment observed in the northern portion of the Property at boring B-13.

Because of this, Willamette Cultural Resources Associates, Ltd., concluded the need for additional archaeological investigations should be reassessed based on construction plans for the Property and proposed depth of disturbance. More specifically, the need for archaeological monitoring should be reassessed if ground-disturbing activities extending beyond 9 to 10 feet bgs are planned for the area surrounding B-13. The potential for finding intact archaeological deposits in fill or dredge deposits is very low; therefore, the potential for encountering intact archaeological deposits during future ground-disturbing work across most of the Property is also low.

3.4 Geotechnical Assessment

The geotechnical assessment report prepared by Hart Crowser, Inc., is included in Appendix B. Based on explorations, testing, and analyses conduct by Hart Crowser, Inc., it is their opinion that the Property is suitable for the proposed development. The report provides a summary of key preliminary geotechnical findings and conclusions.

4 ANALYTICAL RESULTS

Soil and groundwater analytical results were compared to the MTCA Method A CULs for unrestricted land use. Where MTCA Method A CULs were not available for specific analytes, the results were screened against the lower of MTCA Method B CULs for noncancer and cancer values. Analytical results are included in Tables 4-1 (soil) and 4-2 (groundwater). Values for Clark County, Washington⁶ natural background metals concentrations in soil (Ecology, 1994) are also provided in Table 4-1 for reference. Detections below the reporting limits are recorded as the respective method reporting limit on the analytical tables and denoted with a “U” qualifier. Analytical reports are included in Appendix F. The data validation memorandum is included in Appendix G.

Consistent with the WAC 173-340-708(8), mixtures of cPAHs are considered as a single hazardous substance in evaluation of compliance with CULs such that the toxicity of a particular congener is expressed relative to the most toxic congener (benzo(a)pyrene for cPAHs). The toxicity of cPAHs as a group was assessed using a toxic equivalency (TEQ) approach. Each congener in the group is assigned a toxic equivalence factor (TEF) corresponding to the toxicity of that congener relative to the toxicity of benzo(a)pyrene. For example, a congener that is equal in toxicity to benzo(a)pyrene would have a TEF of 1. Similarly, a congener that is half as toxic as benzo(a)pyrene would have a TEF of 0.5, and so on. Multiplying the concentration of a congener by its TEF produces the concentration for that congener that is equivalent in toxicity to the benzo(a)pyrene concentration, known as the toxicity equivalent concentration (TEC). Computing the TEC for each congener (C_i in the equation below) in a sample, followed by summing all TEC values, results in a single cPAH total TEC (i.e., cPAH TEQ) that can be compared to the CUL. The following formulas represent the summation approach:

$$\text{cPAH TEQ} = \sum_{i=1}^k C_i \times \text{TEF}_i$$

cPAH TEQs were qualified and calculated as follows:

- Congeners qualified as non-detect and flagged with a “U” are used in the TEQ calculation at one-half the associated value.
- Congeners qualified as estimated and flagged with a “J” are used without modification in the TEQ calculation.
- Congeners qualified as non-detect with an estimated limit (i.e., flagged with a “UJ”) are used in the TEQ calculation at one-half the associated method reporting value.

⁶ Although the Property is located in Skamania County, not Clark County, the Clark County data group established in the Ecology document includes this portion of Skamania County adjacent to the Columbia River (see Figure 1 of Ecology, 1994).

- If all congeners in a chemical group are undetected, the group sum is reported as undetected.

Consistent with Ecology Implementation Memorandum No. 4, the diesel- and oil-range TPH results were summed for a total detection value and were calculated as follows (Ecology, 2004):

- Diesel- and oil-range hydrocarbon results qualified as non-detect and flagged with a “U” are used in the total calculation at one-half the associated value. When both results are non-detect, the highest detection limit is used.
- Diesel- and oil-range hydrocarbon results qualified as estimated and flagged with a “J” are used in the total calculation without modification.

Consistent with MTCA Method A CUL Tables 720-1 and 740-1, WAC 173-340-900, the naphthalenes (i.e., 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene) results were summed for a total naphthalenes value and calculated as follows:

- Results qualified as non-detect and flagged with a “U” are used in the total calculation at one-half the associated value.

Per WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated shall be submitted simultaneously in both written and electronic formats. The data presented in this report were loaded into Ecology’s Environmental Information Management System on April 11, 2022.

The following subsections summarize analytical results, arranged by medium and AOC.

4.1 Soil

4.1.1 Restrictive Covenant Shallow Soils

The soil samples collected from B1 through B5 and submitted for laboratory analysis were analyzed to determine whether DRO, HRO, PAHs, BTEX, and metals are present in soils below the clean cap (i.e., COCs potentially associated with the areas of PCS identified in the restrictive covenant at Site 1 and Site 2, caused by historical USACE activities at the Property).

Total arsenic was detected in borings B3 and B4 above the MTCA A CUL of 20 mg/kg in samples B3-S-5 and B4-S-8 at concentrations of 23.1 and 27.3 mg/kg, respectively. Other total metals were detected at concentrations below method reporting limits (i.e., non-detect) or below applicable MTCA CULs and background levels.

All other COCs in borings B1 through B5 were detected at concentrations below method reporting limits or below applicable MTCA CULs (see Table 4-1).

Ecology’s MTCASat 97 was used to calculate a 95 percent upper confidence limit of the population mean (95 UCL) for arsenic in soil at the Property. MTCA requires that, for comparison to cleanup

criteria, the 95 UCL must be less than the specified criterion (WAC 173-340-740[7][c][iv][B]). WAC specifies that the calculation assume that the data are lognormally distributed. MTCA has the additional requirements that no single sample concentration shall be greater than two times the cleanup level (WAC 173-340-740[7][e][i]) and less than 10 percent of the sample concentrations shall exceed the soil cleanup level (WAC 173-340-740[7][e][ii]). Based on the arsenic data presented for the Property in Table 4-1, the 95 UCL calculated in MTCASat 97 for arsenic in soil is 10.2 mg/kg (see Appendix H). The 95 UCL estimate is below the MTCA A CUL of 20 mg/kg for arsenic, there is no detected concentration greater than two times the cleanup criterion, and no more than 10 percent of the samples exceed the cleanup criterion. Therefore, arsenic in soil at the Property is in compliance with the established cleanup criterion.

4.1.2 Deep Fill Material

The soil samples collected from B6 and B7 were analyzed to determine whether DRO, HRO, PAHs, PCBs, BTEX, and metals are present in the 25 to 60 feet of fill material placed on the western portion of the Property in AOC 3 (i.e., Columbia River dredge spoils placed on the Property by USACE in the early 1980s).

All COCs in borings B6 and B7 were detected at concentrations below method reporting limits or below applicable MTCA CULs (see Table 4-1).

4.1.3 Shallow Fill Material

The ISM soil samples collected from the Northern DU and Southern DU located in AOC 3 were analyzed to determine whether DRO, HRO, PAHs, PCBs, and metals are present in the shallow fill materials placed across Property (i.e., soils from ground surface to 10 feet bgs).

All COCs were detected at concentrations below method reporting limits or below applicable MTCA CULs.

As described in Section 3.1.3., two discrete soil samples were also collected from boring B14 (sample B14-S-9.5 from 9.5 feet bgs, where a petroleum-like odor was observed, and B14-S-7 from 7.0 feet bgs, from soil above the potentially impacted area) and analyzed for DRO, HRO, PAHs, PBCs, BTEX, and total metals. All COCs were detected at concentrations below method reporting limits or below applicable MTCA CULs (see Table 4-1).

4.2 Groundwater

Groundwater samples were collected from borings B6 and B7 to determine whether COCs associated with the former operations and dredge material are present.

Detections of COCs above applicable MTCA CULs in groundwater samples are as follows:

Arsenic

- Total arsenic was detected in samples B6-W-45 and B6-W-45-DUP at concentrations of 62.3 and 116 micrograms per liter (ug/L), respectively, and in sample B7-W-25 at a concentration of 160 ug/L, above the MTCA CUL of 5 ug/L.
- Dissolved arsenic was detected in sample B6-W-45 and in the duplicate sample collected at B6 (i.e., B6-W-45-DUP) at concentrations of 33.2 and 32.1 ug/L, respectively, and in sample B7-W-25 at a concentration of 153 ug/L, above the MTCA CUL of 5 ug/L.

Chromium

- Total chromium was detected in samples B6-W-45 and B6-W-45-DUP at concentrations of 184 and 430 ug/L, respectively, and in sample B7-W-25 at a concentration of 370 ug/L, above the MTCA CUL of 50 ug/L.
- Dissolved chromium was detected in samples B6-W-45 and B6-W-45-DUP at concentrations of 70.9 and 51.2 ug/L, respectively, and in sample B7-W-25 at a concentration of 371 ug/L, above the MTCA CUL of 50 ug/L.

Lead

- Total lead was detected in samples B6-W-45 and B6-W-45-DUP at concentrations of 78 and 186 ug/L, respectively, and in sample B7-W-25 at a concentration of 190 ug/L, above the MTCA CUL of 15 ug/L.
- Dissolved lead was detected in samples B6-W-45 and B6-W-45-DUP at concentrations of 35 ug/L and 21.9, respectively, and in sample B7-W-25 at a concentration of 183 ug/L, above the MTCA CUL of 15 ug/L.

All other COCs were detected at concentrations below method reporting limits or below applicable MTCA CULs.

As described in Section 3.2, MFA also placed temporary reconnaissance wells and attempted to collect perched groundwater when saturated soil was encountered in borings B5 and B14, as well as boring B4 for coverage at Site 1. However, water was not encountered in sufficient quantity to enable purging, and perched groundwater samples were not collected in these shallow borings.

As the groundwater samples were collected from reconnaissance borings, sediment in the groundwater samples likely contributed to the MTCA CUL exceedances for total and dissolved arsenic, chromium, and lead. These samples were collected from reconnaissance borings using a peristaltic pump (B6) and a disposable bailer (B7). Groundwater was noted to be very turbid and, despite purging the reconnaissance wells, the turbidity meter indicated the turbidity was over range. As shown in the photographs in Appendix D, sediment visibly settled in the sample bottles, including the dissolved metal sample that was field filtered with a 0.45-micron inline filter. In addition, corresponding soil

samples collected from these borings did not have elevated metals concentrations. Therefore, these elevated metals concentrations in the reconnaissance groundwater samples are not anticipated to be representative of groundwater conditions at the Property.

5 CONCEPTUAL SITE MODEL

Historically, the Property was used as a construction staging area during the construction of the Second Powerhouse and was as a disposal area for more than 1 million cubic yards of excavated materials (i.e., dredge spoils excavated from the widening of the northernmost channel of the Columbia River, concrete rubble from the temporary cofferdams, and various construction debris from the construction of the Second Powerhouse). COCs for the Property include metals, DRO, HRO, PAHs, PCBs, and BTEX. Based on current and previous investigations, sources of COCs at the Property include the historical storage, washing, and maintenance of construction equipment (which served features such as fuel farms, equipment maintenance facilities, a wash rack, drum storage, oil change areas, form and draft tube liner construction, and debris disposal areas), and from potentially PCB-contaminated river sediments placed on the Property (i.e., sediments potentially impacted by Bradford Island). Cleanup actions were completed in the 1990s to address the COCs.

Based on the results of the February 2022 FSA subsurface investigation, it appears that the 1990 actions were successful in removing impacted media. Because the FSA results show two minor soil exceedances for arsenic and groundwater exceedances for metals in reconnaissance borings only, MFA did not prepare a conceptual site model.

6 CONCLUSIONS AND RECOMMENDATIONS

Known and suspected areas of contamination at the Property were evaluated as part of this FSA. The following is a summary of those findings and the recommendations regarding the restrictive covenant, regulatory listing, and redevelopment at the Property.

6.1 AOC 1: Site 1—Former Wash Rack Area

The Former Wash Rack Area is an AOC identified in the restrictive covenant as Site 1 (see Figure 2-1), based on PCS left in place following remedial activities conducted in the 1990s. Soil sampling conducted at AOC 1 indicates petroleum hydrocarbons are not present at concentrations exceeding applicable MTCA CULs. Therefore, the restrictive covenant can be removed.

Two soil samples collected from AOC 1 had concentrations of arsenic (23.1 and 27.3 mg/kg) marginally above the MTCA A CUL of 20 mg/kg; however, arsenic is a naturally occurring metal and the 95 UCL estimate (10.2 mg/kg) is below the cleanup criterion, there is no detected concentration greater than two times the cleanup criterion, and no more than 10 percent of the samples exceed the

cleanup criterion. Therefore, arsenic in soil at the Property is in compliance with the established cleanup criterion.

6.2 AOC 2: Site 2—Former Maintenance Building #1

The Former Maintenance Building #1 is an AOC identified in the restrictive covenant as Site 2 (see Figure 2-2), based on PCS left in place following remedial activities conducted in the 1990s. Soil sampling conducted at AOC 1 indicates petroleum hydrocarbons are not present at concentrations exceeding applicable MTCA CULs. Therefore, the restrictive covenant can be removed.

6.3 AOC 3: Fill Material

Preliminary redevelopment designs indicate that mass grading activities at the Property will result in disturbance of soil to a maximum of 7 feet bgs in the northern portion of the Property and to a maximum of 10 feet bgs in the southern portion of the Property. Shallow fill soil samples were collected to evaluate soil conditions. Modified ISM samples collected from surface to 10 feet bgs in these areas did not have detections of COCs exceeding applicable MTCA CULs.

Discrete soil samples were collected from two deep borings (advanced to 36.5 and 51.5 feet bgs) in the southern portion of the Property where the fill soil is most thick. Soil from these borings did not have detections of COCs exceeding applicable MTCA CULs.

Reconnaissance groundwater samples were collected from the two deep borings. The samples did not have detections of DRO, HRO, PAHs, PABs, or BTEX exceeding applicable MTCA CULs. However, concentrations of total and dissolved arsenic, chromium, and lead exceed the MTCA CULs. Sediment in the groundwater samples likely contributed to the exceedances. During purging, the turbidity meter indicated the turbidity was over range. As shown in the photographs in Appendix D, sediment was visibly settling in the sample bottles. In addition, corresponding soil samples collected from these borings did not have elevated metals concentrations. Therefore, these elevated metals concentrations in the reconnaissance groundwater samples are not anticipated to be representative of groundwater conditions at the Property.

6.4 No Further Action Required

The Property is listed in Ecology's cleanup site database as Cleanup Site ID 736, with cleanup started through the standard voluntary cleanup program, project ID no. SW1740. Based on the results of this assessment, a no further action opinion is requested from Ecology.

6.5 Development Considerations

Sampling results from assessment conducted at the Property have not identified contamination at the Property that will need to be managed as part of the redevelopment. Therefore, redevelopment activities can proceed at the Property without preparation of a contaminated media management plan. However, the potential exists for unexpected conditions to be encountered given the past operations

at the Property. If contamination is encountered during redevelopment activities, it should be managed appropriately.

LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

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TABLES



Table 4-1
Summary of Soil Analytical Results
Cascades Business Park
Port of Skamania County

Location:	MTCA A ⁽¹⁾	MTCA B ⁽¹⁾	Background Metals ^{(a)(2)}	B1	B2	B3	B4	B5	B6				
Sample Name:				B1-S-8.5	B2-S-6	B3-S-5	B4-S-8	B5-S-13.5	B6-S-11	B6-S-21	B6-S-31	B6-S-41	B6-S-49.5
Collection Date:				2/9/2022	2/9/2022	2/9/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022
Sample Depth (feet bgs):				8-9	5.5-6.5	4.5-5.5	7.5-8.5	13-14	10.5-11.5	20.5-21.5	30.5-31.5	40.5-41.5	49-50
TPH (mg/kg)													
Diesel Range Hydrocarbons	2,000	NV	NA	12.1 U	11.2 U	11.9 U	10.5 U	12.1 U	11.1 U	10.8 U	11.8 U	12.2 U	11.9 U
Motor Oil Range Hydrocarbons	2,000	NV	NA	24.2 U	22.5 U	203	21 U	24.2 U	22.2 U	26.1 J	23.6 U	69.8	23.9 U
Diesel + Oil ^(b)	2,000	NV	NA	24.2 U	22.5 U	209	21 U	24.2 U	22.2 U	31.5 J	23.6 U	75.9	23.9 U
Total Metals (mg/kg)													
Arsenic	20	NA	6	10.2	7.64	23.1	27.3	6.68	5.29	2.21	1.45	4.23	3.87
Barium	NV	16,000	NV	97.7	46.7	97.4	230	114	93.1	76.7	73	101	92.3
Cadmium	2	NA	1	0.138 U	0.13 U	0.137 U	0.109 U	0.132 U	0.118 U	0.118 U	0.125 U	0.143 J	0.125 U
Chromium	2,000	NA	27	19.5	18.8	21.5	20.1	20.2	11.9	9.53	11.8	17.4	10.8
Lead	250	NV	17	6.15	5.1	9.69	5.38	5.38	4.73	3.37	3.15	7.17	4.38
Mercury	2	NV	0.04	0.0551 U	0.0521 U	0.0619 J	0.0437 U	0.0529 U	0.0473 U	0.0474 U	0.0501 U	0.0502 U	0.0499 U
Selenium	NV	400	NV	0.689 U	0.651 U	0.685 U	0.584 J	0.661 U	0.591 U	0.592 U	0.626 U	0.628 U	0.624 U
Silver	NV	400	NV	0.138 U	0.13 U	0.137 U	0.109 U	0.132 U	0.118 U	0.118 U	0.125 U	0.126 U	0.125 U
Aroclor PCBs (mg/kg)													
Aroclor 1016	NV	5.6	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
Aroclor 1221	NV	NV	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
Aroclor 1232	NV	NV	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
Aroclor 1242	NV	NV	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
Aroclor 1248	NV	NV	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
Aroclor 1254	NV	0.5	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
Aroclor 1260	NV	0.5	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
Total PCBs ^(c)	1	NA	NA	--	--	--	--	--	0.00558 U	0.00564 U	0.00591 U	0.00609 U	0.00589 U
BTEX (mg/kg)													
Benzene	0.03	NA	NA	0.00689 U	0.00683 U	0.00702 U	0.00617 U	0.00704 U	0.00483 U	0.00557 U	0.00584 U	0.00774 U	0.00571 U
Ethylbenzene	6	NA	NA	0.0172 U	0.0171 U	0.0176 U	0.0154 U	0.0176 U	0.0121 U	0.0139 U	0.0146 U	0.0193 U	0.0143 U
Toluene	7	NA	NA	0.0345 U	0.0342 U	0.0351 U	0.0308 U	0.0352 U	0.0241 U	0.0279 U	0.0292 U	0.0387 U	0.0285 U
Xylenes (total)	9	NA	NA	0.0517 U	0.0513 U	0.0527 U	0.0462 U	0.0528 U	0.0362 U	0.0418 U	0.0438 U	0.058 U	0.0428 U
PAHs (mg/kg)													
1-Methylnaphthalene	5	NA	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
2-Methylnaphthalene	5	NA	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Acenaphthene	NV	4,800	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Acenaphthylene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Anthracene	NV	24,000	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Benzo(a)anthracene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Benzo(a)pyrene	0.1	NA	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Benzo(b)fluoranthene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Benzo(ghi)perylene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Benzo(k)fluoranthene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Chrysene	NV	NV	NA	0.00578 U	0.00583 U	0.0125 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U

Table 4-1
Summary of Soil Analytical Results
Cascades Business Park
Port of Skamania County

Location:	MTCA A ⁽¹⁾	MTCA B ⁽¹⁾	Background Metals ^{(a)(2)}	B1	B2	B3	B4	B5	B6				
Sample Name:				B1-S-8.5	B2-S-6	B3-S-5	B4-S-8	B5-S-13.5	B6-S-11	B6-S-21	B6-S-31	B6-S-41	B6-S-49.5
Collection Date:				2/9/2022	2/9/2022	2/9/2022	2/9/2022	2/9/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022
Sample Depth (feet bgs):				8-9	5.5-6.5	4.5-5.5	7.5-8.5	13-14	10.5-11.5	20.5-21.5	30.5-31.5	40.5-41.5	49-50
Dibenzo(a,h)anthracene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Dibenzofuran	NV	80	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Fluoranthene	NV	3,200	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Fluorene	NV	3,200	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Indeno(1,2,3-cd)pyrene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Naphthalene	5	NA	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Phenanthrene	NV	NV	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
Pyrene	NV	2,400	NA	0.00578 U	0.00583 U	0.00711 J	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U
cPAH TEQ ^(d)	0.1	NA	NA	0.00436 U	0.00440 U	0.00477 U	0.00404 U	0.00482 U	0.00400 U	0.00424 U	0.00436 U	0.00475 U	0.00427 U
Total Naphthalenes ^(e)	5	NA	NA	0.00578 U	0.00583 U	0.00627 U	0.00535 U	0.00638 U	0.0053 U	0.00561 U	0.00577 U	0.00629 U	0.00565 U

Table 4-1
Summary of Soil Analytical Results
Cascades Business Park
Port of Skamania County

Location:	MTCA A ⁽¹⁾	MTCA B ⁽¹⁾	Background Metals ^{(a)(2)}	B7				B14		NDU		SDU	
Sample Name:				B7-S-11	B7-S-21	B7-S-29.5	B7-S-35	B14-S-7	B14-S-9.5	NDU-S-0-5	NDU-S-5-10	SDU-S-0-5	SDU-S-5-10
Collection Date:				2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/9/2022	2/9/2022	2/9/2022	2/9/2022
Sample Depth (feet bgs):				10.5-11.5	20.5-21.5	29-30	34.5-35.5	6.5-7.5	9-10	0-5	5-10	0-5	5-10
TPH (mg/kg)													
Diesel Range Hydrocarbons	2,000	NV	NA	11.9 U	11.7 U	11.8 U	12.7 U	11 U	118	9.69 U	19.3 J	9.57 U	10 U
Motor Oil Range Hydrocarbons	2,000	NV	NA	23.9 U	23.5 U	23.7 U	29.9 J	22 U	32.9 J	203	82	26.7 J	20.1 U
Diesel + Oil ^(b)	2,000	NV	NA	23.9 U	23.5 U	23.7 U	36.3 J	22 U	151 J	208	101 J	31.5 J	20.1 U
Total Metals (mg/kg)													
Arsenic	20	NA	6	4.6	4.07	7.18	5.41	4.04	1.56	5.58	7.45	5.98	4.83
Barium	NV	16,000	NV	101	107	103	98.5	74.8	73.3	122	111	117	121
Cadmium	2	NA	1	0.207 J	0.122 U	0.128 U	0.128 U	0.122 U	0.121 U	0.136 J	0.122 J	0.112 U	0.108 U
Chromium	2,000	NA	27	15.8	13.6	16	15.8	14.2	12	26.3	22.4	18.8	17.7
Lead	250	NV	17	5.05	5.6	5.72	5.24	4.58	2.67	10.2	6.96	6.59	5.68
Mercury	2	NV	0.04	0.05 U	0.0487 U	0.0514 U	0.0512 U	0.0489 U	0.0483 U	0.0406 U	0.0438 U	0.0449 U	0.0433 U
Selenium	NV	400	NV	0.625 U	0.609 U	0.642 U	0.64 U	0.611 U	0.604 U	0.508 U	0.547 U	0.562 U	0.542 U
Silver	NV	400	NV	0.125 U	0.122 U	0.128 U	0.128 U	0.122 U	0.121 U	0.102 U	0.109 U	0.112 U	0.108 U
Aroclor PCBs (mg/kg)													
Aroclor 1016	NV	5.6	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
Aroclor 1221	NV	NV	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
Aroclor 1232	NV	NV	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
Aroclor 1242	NV	NV	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
Aroclor 1248	NV	NV	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
Aroclor 1254	NV	0.5	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
Aroclor 1260	NV	0.5	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
Total PCBs ^(c)	1	NA	NA	0.00616 U	0.00594 U	0.00589 U	0.00622 U	0.00558 U	0.00535 U	0.00505 U	0.0051 U	0.00503 U	0.005 U
BTEX (mg/kg)													
Benzene	0.03	NA	NA	0.00552 U	0.00585 U	0.005 U	0.00629 U	0.00549 U	0.00491 U	--	--	--	--
Ethylbenzene	6	NA	NA	0.0138 U	0.0146 U	0.0125 U	0.0157 U	0.0137 U	0.0123 U	--	--	--	--
Toluene	7	NA	NA	0.0276 U	0.0292 U	0.025 U	0.0315 U	0.0274 U	0.0246 U	--	--	--	--
Xylenes (total)	9	NA	NA	0.0414 U	0.0439 U	0.0375 U	0.0472 U	0.0411 U	0.0368 U	--	--	--	--
PAHs (mg/kg)													
1-Methylnaphthalene	5	NA	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
2-Methylnaphthalene	5	NA	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Acenaphthene	NV	4,800	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.0107 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Acenaphthylene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Anthracene	NV	24,000	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Benzo(a)anthracene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00951 U	0.00492 U	0.00488 U
Benzo(a)pyrene	0.1	NA	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00521 J	0.00476 U	0.00492 U	0.00488 U
Benzo(b)fluoranthene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.0064 J	0.00476 U	0.00492 U	0.00488 U
Benzo(ghi)perylene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00731 J	0.00476 U	0.00492 U	0.00488 U
Benzo(k)fluoranthene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Chrysene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00708 J	0.00951 U	0.00492 U	0.00488 U

Table 4-1
Summary of Soil Analytical Results
Cascades Business Park
Port of Skamania County

Location:	MTCA A ⁽¹⁾	MTCA B ⁽¹⁾	Background Metals ^{(a)(2)}	B7				B14		NDU		SDU	
Sample Name:				B7-S-11	B7-S-21	B7-S-29.5	B7-S-35	B14-S-7	B14-S-9.5	NDU-S-0-5	NDU-S-5-10	SDU-S-0-5	SDU-S-5-10
Collection Date:				2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/10/2022	2/9/2022	2/9/2022	2/9/2022	2/9/2022
Sample Depth (feet bgs):				10.5-11.5	20.5-21.5	29-30	34.5-35.5	6.5-7.5	9-10	0-5	5-10	0-5	5-10
Dibenzo(a,h)anthracene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Dibenzofuran	NV	80	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.0143	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Fluoranthene	NV	3,200	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00487 J	0.00476 U	0.00492 U	0.00488 U
Fluorene	NV	3,200	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.028	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Indeno(1,2,3-cd)pyrene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00573 J	0.00476 U	0.00492 U	0.00488 U
Naphthalene	5	NA	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00537 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Phenanthrene	NV	NV	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.0378	0.00476 U	0.00476 U	0.00492 U	0.00488 U
Pyrene	NV	2,400	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.00952 J	0.00622 J	0.00476 U	0.00492 U	0.00488 U
cPAH TEQ ^(d)	0.1	NA	NA	0.00470 U	0.00440 U	0.00461 U	0.00488 U	0.00436 U	0.00405 U	0.00721 J	0.00386 U	0.00371 U	0.00368 U
Total Naphthalenes ^(e)	5	NA	NA	0.00623 U	0.00583 U	0.0061 U	0.00646 U	0.00577 U	0.0107 U	0.00476 U	0.00476 U	0.00492 U	0.00488 U

Table 4-1
Summary of Soil Analytical Results
Cascades Business Park
Port of Skamania County

NOTES:
Shading indicates values that exceed screening criteria; non-detects ("U" or "UJ") were not compared with screening criteria. When the result is greater than the screening criteria but less than the soil background level, the result is not shaded.
MTCA A, Unrestricted Land Use
-- = not analyzed.
bgs = below ground surface.
BTEX = benzene, toluene, ethylbenzene, and xylenes.
cPAH = carcinogenic polycyclic aromatic hydrocarbons.
J = result is an estimated value.
mg/kg = milligrams per kilogram.
MTCA = Model Toxics Control Act.
MTCA A = Model Toxics Control Act Method A, unrestricted land use.
MTCA B = Model Toxics Control Act Method B; lower of carcinogen or noncarcinogen value, for direct contact.
NA = not applicable.
NV = no value.
PAH = polycyclic aromatic hydrocarbons.
PCB = polychlorinated biphenyl.
TEQ = toxic equivalency.
TPH = total petroleum hydrocarbons.
U = result is non-detect to laboratory detection limit.
UJ = result is non-detect with an estimated laboratory detection limit.
^(a) Background levels are included in the table for purposes of comparison, but are not used in screening the sample concentrations.
^(b) Total diesel + oil is the sum of diesel- and motor-oil-range hydrocarbons. When results are non-detect, one-half the detection limit is used. When all results are non-detect, the highest detection limit is shown.
^(c) Total PCBs is the sum of all-PCB Aroclors. When results are non-detect, one-half the detection limit is used. When all results are non-detect, the highest detection limit is shown.
^(d) cPAH TEQ values are based on toxicity equivalence factors from Washington State Department of Ecology Implementation Memorandum #10 (Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs). April 20, 2015.
^(e) Total naphthalene is the sum of all naphthalenes. When results are all non-detect, the highest detection limit is shown.
REFERENCES:
⁽¹⁾ Washington State Department of Ecology. 2021. Cleanup Levels and Risk Calculation Table. July.
⁽²⁾ Washington State Department of Ecology. 1994. Natural Background Soil Metals Concentrations in Washington State. October.

Table 4-2
Summary of Groundwater Analytical Results
Cascades Business Park
Port of Skamania County



Location	MTCA A ⁽¹⁾	MTCA B ^{(a)(1)}	B6		B7
Sample Name:			B6-W-45	B6-W-45-DUP	B7-W-25
Collection Date:			2/10/2022	2/10/2022	2/10/2022
Sample Depth (feet bgs):			40-50	40-50	20-30
TPH (ug/L)					
Diesel-Range Hydrocarbons	500	NV	223 J	225 J	116 U
Motor Oil-Range Hydrocarbons	500	NV	278 U	250 U	233 U
Diesel + Oil ^(b)	500	NV	390 U	363 U	233 U
Dissolved Metals (ug/L)					
Arsenic	5	NA	33.2	32.1	153
Barium	NV	3,200	425	286	1,660
Cadmium	5	NA	0.50 U	0.50 U	1.82
Chromium	50	NV	70.9	51.2	371
Lead	15	NV	35	21.9	183
Mercury	2	NV	0.20 U	0.20 U	0.997
Selenium	NV	80	2.7 J	2.5 U	10
Silver	NV	80	0.5 U	0.5 U	1.58
Total Metals (ug/L)					
Arsenic	5	NA	62.3 J	116 J	160
Barium	NV	3,200	1,050 J	2,340 J	1,740
Cadmium	5	NA	2.0 UJ	2.29 J	2.0 U
Chromium	50	NV	184 J	430 J	370
Lead	15	NV	78 J	186 J	190
Mercury	2	NV	0.80 U	0.80 U	1.03 J
Selenium	NV	80	10 U	10 U	13.2 J
Silver	NV	80	2.0 U	2.0 U	2.0 U
PCB Aroclors (ug/L)					
Aroclor 1016	NV	0.56	0.026 U	0.025 U	0.0364 U
Aroclor 1221	NV	NV	0.0519 U	0.025 U	0.0364 U
Aroclor 1232	NV	NV	0.026 U	0.025 U	0.0364 U
Aroclor 1242	NV	NV	0.026 U	0.025 U	0.0364 U
Aroclor 1248	NV	NV	0.026 U	0.025 U	0.0364 U
Aroclor 1254	NV	0.022	0.026 U	0.025 U	0.0364 U
Aroclor 1260	NV	0.022	0.026 U	0.025 U	0.0364 U
Total PCBs ^(c)	0.1	NA	0.0519 U	0.025 U	0.0364 U
BTEX (ug/L)					
Benzene	5	NA	0.15 J	0.14 J	0.1 U
Ethylbenzene	700	NA	0.25 U	0.25 U	0.25 U
Toluene	1,000	NA	0.50 U	0.50 U	0.50 U
Xylenes (total)	1,000	NA	0.75 U	0.75 U	0.75 U

Table 4-2
Summary of Groundwater Analytical Results
Cascades Business Park
Port of Skamania County



Location	MTCA A ⁽¹⁾	MTCA B ^{(a)(1)}	B6		B7
Sample Name:			B6-W-45	B6-W-45-DUP	B7-W-25
Collection Date:			2/10/2022	2/10/2022	2/10/2022
Sample Depth (feet bgs):			40-50	40-50	20-30
PAH (ug/L)					
1-Methylnaphthalene	160	NA	1.4	1.8	0.0667 U
2-Methylnaphthalene	160	NA	1.66	2.15	0.0667 U
Acenaphthene	NV	480	0.205 U	0.277 U	0.0333 U
Acenaphthylene	NV	NV	0.04 U	0.0422 U	0.0333 U
Anthracene	NV	2,400	0.02 U	0.0422 U	0.0333 U
Benzo(a)anthracene	NV	NV	0.01 U	0.0106 U	0.0333 U
Benzo(a)pyrene	0.1	NA	0.0105 J	0.0106 U	0.0333 U
Benzo(b)fluoranthene	NV	NV	0.0115 J	0.0106 U	0.0333 U
Benzo(ghi)perylene	NV	NV	0.02 U	0.0211 U	0.0333 U
Benzo(k)fluoranthene	NV	NV	0.0125 J	0.0106 U	0.0333 U
Carbazole	NV	NV	0.0871	0.0887	--
Chrysene	NV	NV	0.01 J	0.0106 U	0.0333 U
Dibenzo(a,h)anthracene	NV	NV	0.01 U	0.0106 U	0.0333 U
Dibenzofuran	NV	8	0.0906	0.118	0.0333 U
Fluoranthene	NV	640	0.02 U	0.0422 U	0.0333 U
Fluorene	NV	320	0.171	0.222	0.0333 U
Indeno(1,2,3-cd)pyrene	NV	NV	0.01 U	0.0106 U	0.0333 U
Naphthalene	160	NA	0.641	0.755	0.0667 U
Phenanthrene	NV	NV	0.111	0.165	0.0333 U
Pyrene	NV	240	0.02 U	0.0211 U	0.0333 U
cPAH TEQ ^(d)	0.1	NA	0.0145 J	0.008 U	0.0251 U
Total Naphthalenes ^(e)	160	NA	3.7	4.7	0.0667 U

Table 4-2
Summary of Groundwater Analytical Results
Cascades Business Park
Port of Skamania County



NOTES:

Shading indicates values that exceed screening criteria; non-detects ("U" or "UJ") were not compared with screening criteria.

MTCA A, Unrestricted Land Use

-- = not analyzed.

bgs = below ground surface

cPAH = carcinogenic polycyclic aromatic hydrocarbons.

J = result is an estimated value.

MTCA = Model Toxics Control Act.

BTEX = benzene, toluene, ethylbenzene, and xylenes.

NV = no value.

TEQ = toxic equivalency.

TPH = total petroleum hydrocarbons.

U = result is non-detect to laboratory detection limit.

ug/L = micrograms per liter.

UJ = result is non-detect with an estimated laboratory detection limit.

PAH = polycyclic aromatic hydrocarbons.

PCB = polychlorinated biphenyl.

^(a)Value is the lower of MTCA Method B noncancer and cancer values.

^(b)Total diesel + oil is the sum of diesel- and motor-oil-range hydrocarbons. When results are non-detect, one-half the reporting limit is used. When all results are non-detect, the highest detection limit is shown.

^(c)Total PCBs is the sum of all PCB Aroclors. When results are non-detect, one-half the detection limit is used. When all results are non-detect, the highest detection limit is shown.

^(d)cPAH TEQ values are based on toxicity equivalence factors from Washington State Department of Ecology Implementation Memorandum #10 (Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors [TEFs]). April 20, 2015.

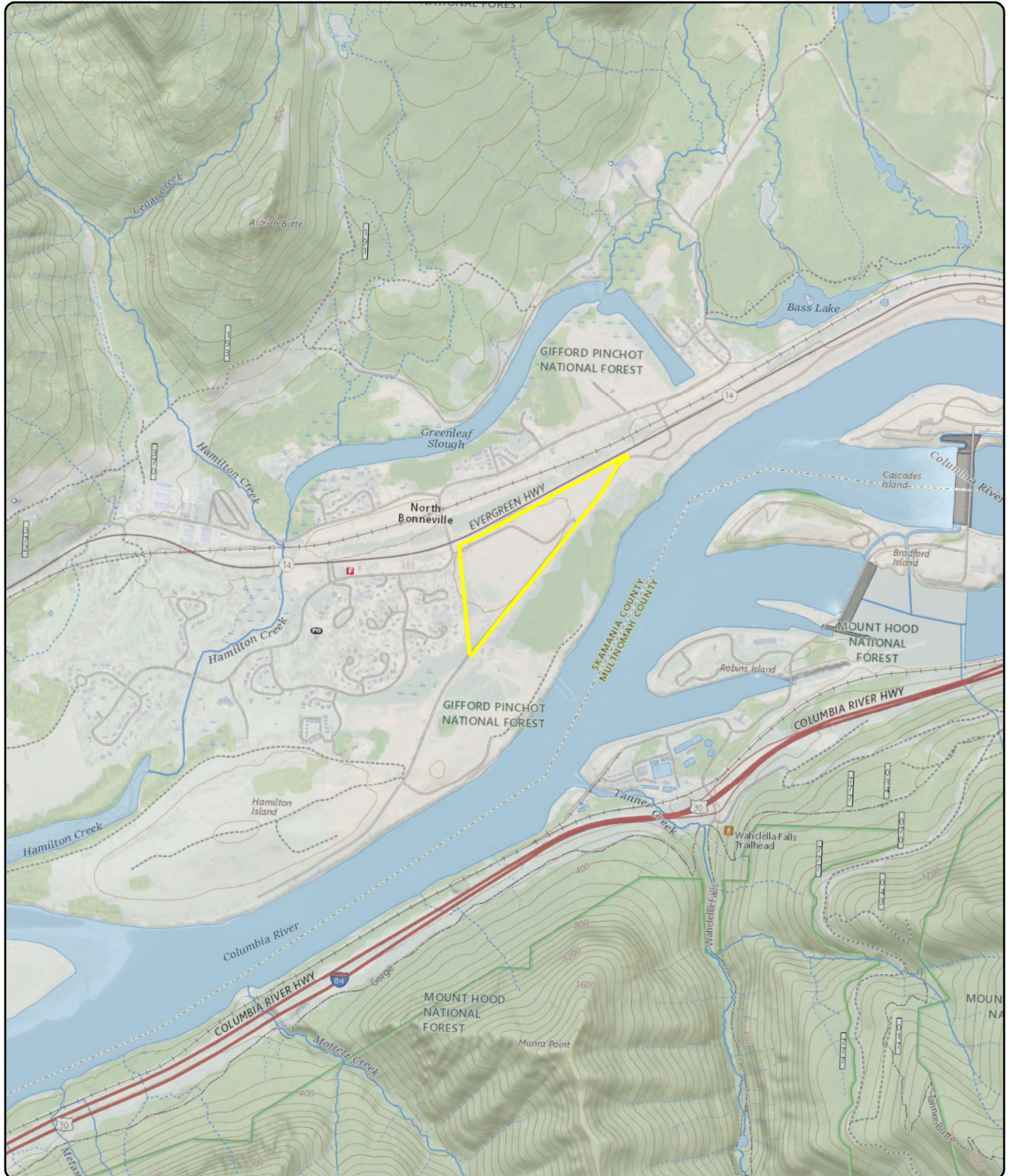
^(e)Total naphthalenes is the sum of all naphthalenes. When results are non-detect, one half the reporting limit is used. When results are all non-detect, the highest detection limit is shown.

REFERENCE:

⁽¹⁾Washington State Department of Ecology. 2021. Cleanup Levels and Risk Calculation Table. July.

FIGURES





Address: Cascades Business Park
 North Bonneville, WA 98639
 Source: USGS 7.5-minute
 topographic quadrangle:
 Bonneville Dam (2020)
 Section 20, township 2 north, range 7 east.

Legend

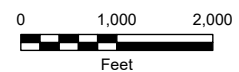
Property

Figure 1-1
Property Location
 Cascades Business Park
 North Bonneville, WA 98639



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Source: Aerial imagery obtained from MapBox.
 Address: Cascades Business Park
 North Bonneville, WA 98639
 Section 20, township 2 north, range 7 east.
 Restricted area based on survey conducted
 on 9/16/2020 by Klein & Associates, Inc.,
 per legal description book 177, page 839.

Legend

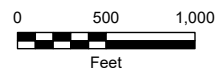
- Restricted Area
- Property

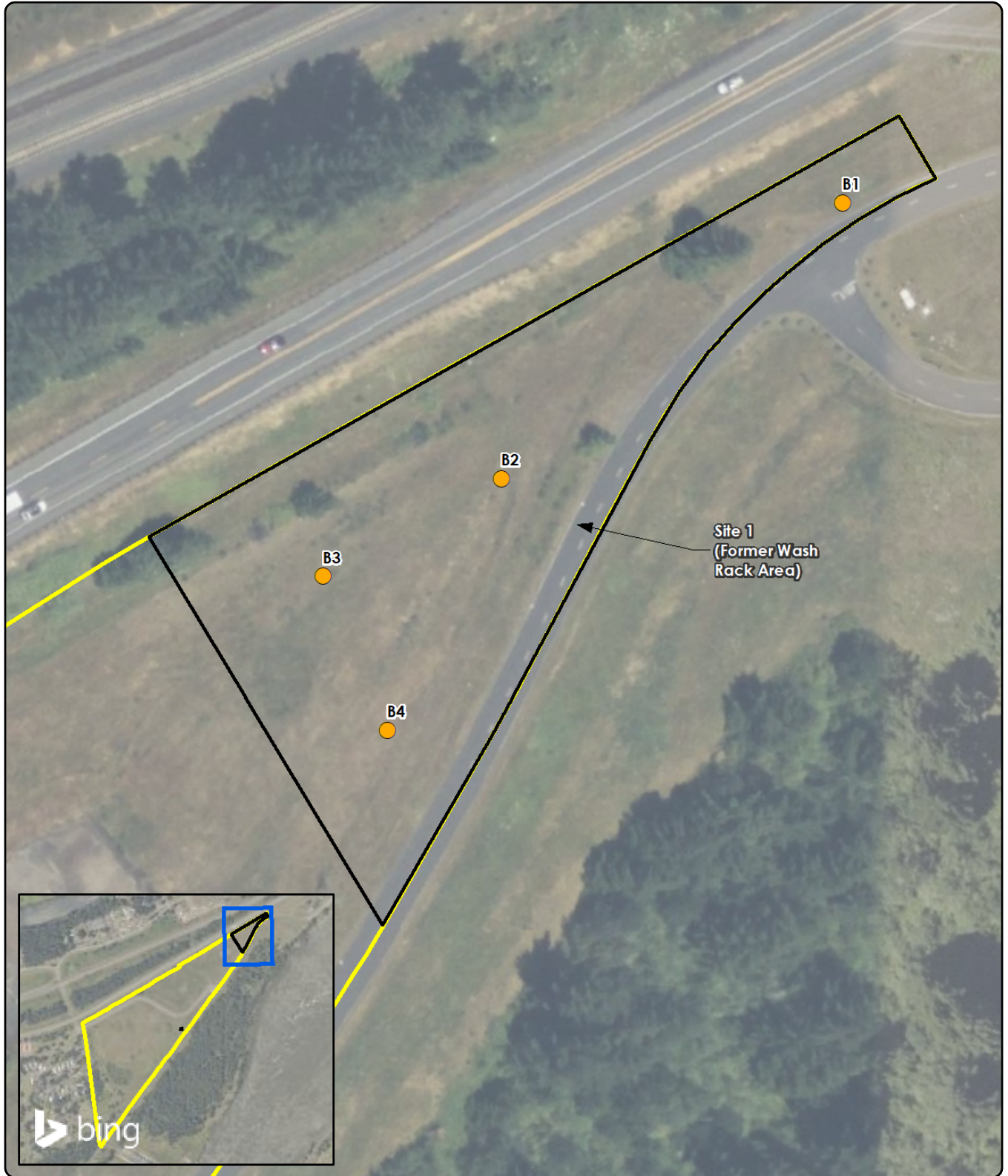
Figure 1-2
Property Features
 Cascades Business Park
 North Bonneville, WA 98639



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Source: Aerial imagery obtained from Bing.
Address: Cascades Business Park
North Bonneville, WA 98639
Section 20, township 2 north, range 7 east.
Restricted area based on survey conducted
on 9/16/2020 by Klein & Associates, Inc.,
per legal description book 177, page 839.

Legend

- Restrictive Covenant Soil Sampling Location
- Restricted Area
- Property

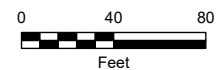
Figure 2-1 Site 1 – Former Wash Rack Area

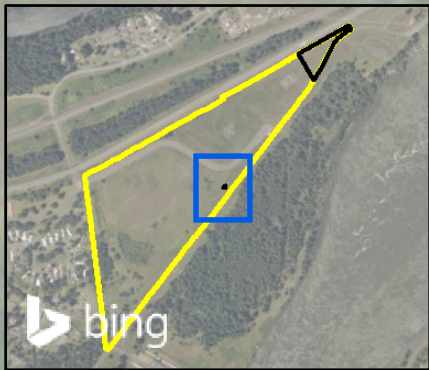
Cascades Business Park
North Bonneville, WA 98639



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Source: Aerial imagery obtained from Bing.
 Address: Cascades Business Park
 North Bonneville, WA 98639
 Section 20, township 2 north, range 7 east.
 Restricted area based on survey conducted on
 9/16/2020 by Klein & Associates, Inc., per
 legal description book 177, page 839.



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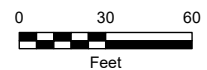
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

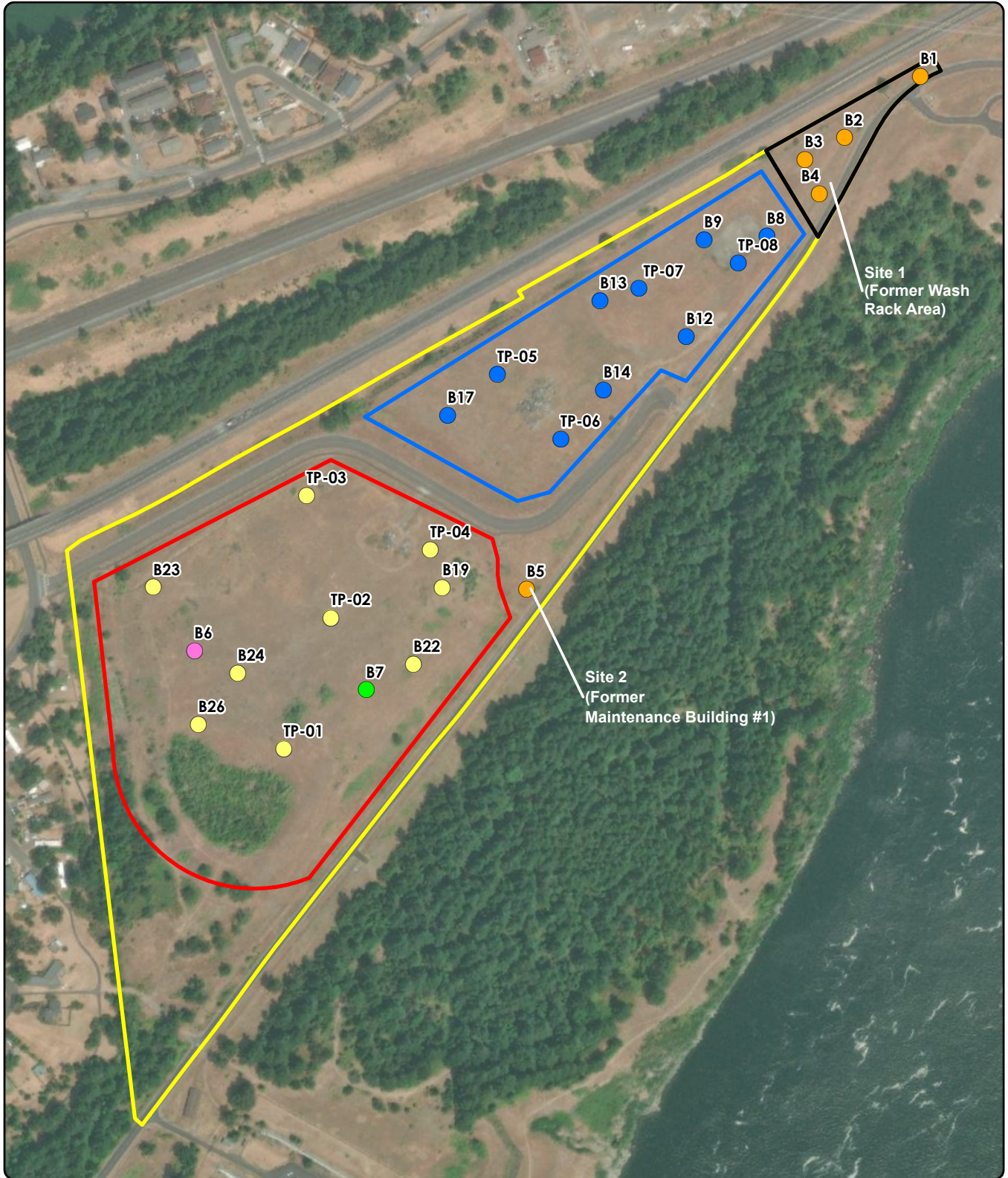
Legend

- Restrictive Covenant Soil Sampling Location
- Restricted Area
- Property

Figure 2-2 Site 2 – Former Maintenance Building #1

Cascades Business Park
 North Bonneville, WA 98639





Source: Aerial imagery obtained from Esri.
Address: Cascades Business Park
North Bonneville, WA 98639
Restricted area based on survey conducted on
9/16/2020 by Klein & Associates, Inc., per legal
description book 177, page 839.
Notes:
B6 and B7 are sonic boring locations; the remaining boring
locations were advanced with direct push.
DU = decision unit.
TP = test pit.

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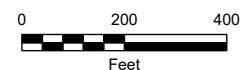
This product is for informational purposes and may not have been prepared for, or be suitable
for legal, engineering, or surveying purposes. Users of this information should review or
consult the primary data and information sources to ascertain the suitability of the information.

Legend

- Restrictive Covenant Soil Sampling Location
- Groundwater and Deep Soil Sampling Location
- Groundwater and Deep Soil Sampling Location; Southern DU Shallow Soil Sampling Location
- Northern DU Shallow Soil Sampling Location
- Southern DU Shallow Soil Sampling Location
- Northern DU
- Southern DU
- Restricted Area
- Property

Figure 2-3 Soil and Groundwater Sampling Locations

Cascades Business Park
North Bonneville, WA 98639



APPENDIX A

BORING LOGS





MAUL FOSTER ALONGI

Geologic Borehole LogProject Number
M0350.04.001Boring Number
B1Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/9/2022 to 2/9/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Sample Data		PID (ppm)	Lithologic Column	Soil Description
			Collection Method	Sample ID			
1			GP		0.0		0 to 0.5 feet: GRAVELLY SILT with SAND (ML); medium brown; 60% fines, no plasticity; 10% sand, fine-grained; 30% gravel, fine- to coarse-grained, subangular to subrounded; trace rootlets; soft; moist.
2					0.0		0.5 to 2.5 feet: SILTY GRAVEL (GM); dark gray; 20% fines, no plasticity; 80% gravel, fine- to coarse-grained, subangular to subrounded; trace very coarse gravel, subrounded; medium density; moist.
3		100					
4			GRAB	B1-S-3	0.2		2.5 to 3.5 feet: SANDY SILT with GRAVEL (ML); medium gray; 70% fines, no plasticity; 20% sand, fine-grained; 10% gravel, fine- to medium-grained, subangular to subrounded; stiff; moist.
5			GP		0.0		3.5 to 10.0 feet: SILTY SAND (SM); yellowish brown; 20% fines, no plasticity; 70% sand, fine- to medium-grained; 10% gravel, fine- to medium-grained; trace very coarse gravel, subrounded; moist.
6			GRAB	B1-S-5.5			
7					0.0		
8		80					@ 8.0 feet: reddish-brown.
9			GRAB	B1-S-8.5			@ 8.5 feet: dry.
10					0.0		

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B2Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/9/2022 to 2/9/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data					Soil Description		
Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column	
1		90	GP	B2-S-2.5	0.0	0 to 0.5 feet: GRAVELLY SILT with SAND (ML); medium brown; 60% fines, no plasticity; 10% sand, fine-grained; 30% gravel, fine- to coarse-grained, subangular to subrounded; trace rootlets; soft; moist.	
2					0.5 to 2.0 feet: SILTY GRAVEL (GM); dark gray; 20% fines, no plasticity; 80% gravel, fine- to coarse-grained, subangular to subrounded; trace very coarse gravel, subrounded; moist.		
3					2.0 to 10.0 feet: SILTY SAND (SM); yellowish brown; 20% fines, no plasticity; 70% sand, fine- to medium-grained, subangular to subrounded; 10% gravel, fine- to medium-grained; trace rootlets; trace coarse gravel, subrounded; dense; moist.		
4					0.0		
5			GP		0.0	@ 4.5 feet: lens of red sand, subrounded.	
6			GRAB	B2-S-6	0.0		
7							
8		100			0.0		
9			GRAB	B2-S-8.5			@ 9.0 feet: dry.
10							@ 9.5 feet: lens of red sand, subrounded.

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B3Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/9/2022 to 2/9/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Sample Data		Lithologic Column	Soil Description
					Sample ID	PID (ppm)		
1				GP				0 to 0.5 feet: GRAVELLY SILT with SAND (ML); medium brown; 60% fines, non-plastic; 10% sand, very fine- to medium-grained; 30% gravel, fine- to medium-grained; trace rootlets; soft; moist.
2								0.5 to 3.5 feet: SILTY GRAVEL (GM); medium gray; 20% fines, non-plastic; 80% gravel, fine- to coarse-grained, subangular to subrounded; trace very coarse gravel, subrounded; moist.
3		100		GRAB	B3-S-3	0.0		
4								3.5 to 5.5 feet: SANDY SILT with GRAVEL (ML); medium gray-brown; 70% fines, non-plastic; 20% sand, fine-grained; 10% gravel, fine- to coarse-grained, subangular to subrounded; very stiff; moist.
5				GP				
6				GRAB	B3-S-5	0.0		5.5 to 7.0 feet: SILTY GRAVEL (GM); gray; 20% fines, non-plastic; 80% gravel, fine- to coarse-grained; trace very coarse gravel, subrounded; dry.
7								
8		100		GRAB	B3-S-8	0.0		7.0 to 8.5 feet: GRAVELLY SILT with SAND (ML); grayish brown; 70% fines, non-plastic; 10% sand, very fine- to fine-grained; 20% gravel, fine- to medium-grained; trace coarse gravel; trace green/blue discoloration; very stiff; dry.
9								
10								8.5 to 10.0 feet: SILTY SAND with GRAVEL (SM); yellowish-brown; 20% fines, non-plastic; 60% sand, fine- to medium-grained; 20% gravel, fine- to medium-grained; dry. @ 8.75 feet: woody debris.

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B4Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/9/2022 to 2/9/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data										Soil Description	
Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Screen Int.	Sample ID	PID (ppm)	Lithologic Column			
1				GP		B4-S-1	0.0			0 to 1.0 feet: SILT with GRAVEL and SAND (ML); medium brown; 60% fines, low plasticity; 20% sand, very fine- to fine-grained; 20% gravel, fine- to medium-grained, subangular to subrounded; trace coarse gravel, subrounded; soft; moist.	
2				GRAB						1.0 to 4.5 feet: SILTY GRAVEL with SAND (GM); dark gray-brown; 20% fines, non-plastic to low plasticity; 10% sand, fine-grained; 70% gravel, fine- to coarse-grained; trace very coarse gravel, subrounded; moist.	
3			80				0.0				
4										@ 4.0 feet: increase in fines.	
5				GP		B4-S-5	0.2			4.5 to 5.5 feet: SILT with GRAVEL and SAND (ML); medium gray; 60% fines, non-plastic; 20% sand, very fine- to fine-grained; 20% gravel, fine- to medium-grained, subrounded; trace coarse gravel, subrounded; stiff; moist.	
6				GRAB						5.5 to 10.0 feet: SILTY SAND with GRAVEL (SM); yellow-brown; 20% fines, non-plastic; 70% sand, fine- to medium-grained, subangular to subrounded; 10% gravel, fine- to medium-grained, subangular to subrounded; trace coarse gravel, subrounded; very loose; moist.	
7							0.1			@ 7.0 feet: increase in gravel up to 20%.	
8			100			B4-S-8					
9				GRAB			0.0				
10											

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. Temporary well set, but no water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Reconnaissance Well Completion Details

2-inch diameter temporary polyvinyl chloride screen set from 5.0 to 10.0 feet bgs, indicated by dashed graphic in the interval column.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B5Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/9/2022 to 2/9/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **14.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data										Soil Description	
Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Screen Int.	Sample ID	PID (ppm)	Lithologic Column			
1				GP						0 to 2.5 feet: GRAVELLY SILT (ML); medium brown; 60% fines, medium plasticity; 10% sand, fine- to medium-grained; 30% gravel, fine- to medium-grained, subangular to subrounded; trace rootlets; soft; moist.	
2							0.0				
3		80		GRAB		B5-S-3	0.0			2.5 to 3.0 feet: GRAVEL with SILT (GP-GM); medium brown; 10% fines, medium plasticity; 10% sand, very fine; 80% gravel, medium- to coarse-grained, subangular to subrounded; dense; moist.	
4										3.0 to 5.0 feet: SILTY GRAVEL (GM); medium brown; 40% fines, medium plasticity; 10% sand, very fine- to fine-grained; 50% gravel, medium- to coarse-grained, subangular to subrounded; moist.	
5				GP			0.0			5.0 to 6.0 feet: GRAVELLY SILT with SAND (ML); medium brown; 50% fines, medium plasticity; 25% sand, very fine- to medium-grained; 25% gravel, medium- to coarse-grained, subangular to subrounded; trace mica; trace rootlets; soft; moist.	
6										6.0 to 9.0 feet: SILTY GRAVEL (GM); gray brown; 40% fines, medium plasticity; 10% sand, very fine- to fine-grained; 50% gravel, medium- to coarse-grained, subangular to subrounded; moist.	
7				GRAB		B5-S-7	0.0			@ 8.0 feet: wet.	
8		100								@ 8.5 feet: pockets of dark gray and rusty red coloration.	
9										@ 8.75 feet: increase in fine grained gravel.	
10				GP			0.0			9.0 to 10.5 feet: GRAVELLY SILT (ML); medium dark gray-brown; 60% fines, medium plasticity; 10% sand, very fine-grained; 30% gravel, fine- to coarse-grained, subangular to subrounded; trace rootlets; soft; wet.	
11										10.5 to 12.0 feet: GRAVELLY SILT with SAND (ML); 60% fines, medium plasticity; 20% sand, very fine-grained; 20% gravel, fine- to medium-grained, subangular to subrounded; trace rootlets; very soft; slight sulfur-like odor; wet.	
12		80		GRAB		B5-S-11	0.2			@ 11.0 feet: medium reddish brown.	
13							0.1			12.0 to 12.5 feet: GRAVEL (GP); gray; 100% gravel, coarse to very coarse; dry.	
13				GRAB		B5-S-13.5	0.0			12.5 to 13.0 feet: SAND with SILT (SP-SM); medium reddish brown; 10% fines; 80% sand, fine- to medium-grained, subangular to subrounded; 10% gravel, fine-grained, subangular; very loose; moist.	
14							0.0			13.0 to 14.0 feet: SILTY SAND (SM); medium yellow-brown; 40% fines, non-plastic; 50% sand, very fine- to fine-grained; 10% gravel, fine-grained; dense; moist.	

Total Depth = 14.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million.

Borehole Completion Details

0 to 14.0 feet: 2.25-inch borehole.

Reconnaissance Well Completion Details

2-inch diameter temporary polyvinyl chloride screen set from 4.0 to 14.0 feet bgs, indicated by dashed graphic in the interval column.

Borehole Abandonment Details

0 to 14.0 feet: Bentonite chips hydrated with potable water.

▽ Water level measurement is 12.8 feet bgs, measured after temporary well installation. Insufficient water for purging and sampling.

CDA BOREHOLE WIRECON SCREEN WA\GINT\GINTW\PROJECTS\0350.04.01\BORING LOGS.GPJ 4/22/22



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number

M0350.04.001

Boring Number

B6

Sheet

1 of 3

Project Name Port of Skamania County: Cascades Business Park

Project Location Coyote Ridge Road, North Bonneville, WA

Surface Elevation (feet)

Start/End Date 2/10/2022 to 2/10/2022

Northing

Driller/Equipment Holt Services, Inc./Sonic TSi 150CC Track-mounted drill rig

Easting

Geologist/Engineer E. Hess, LHG

Total Depth of Borehole

51.5 feet

Sample Method Core Barrel

Outer Hole Diam

6 inch

Sample Data

Soil Description

Depth
(feet, bgs)Water
Levels

Interval

Percent
RecoveryCollection
Method

Screen Int.

Sample ID

PID
(ppm)Lithologic
Column

CB

100

CB

100

CB

B6-S-11

100

CB

100

0.0

0.0

0.0

0.0

0.0

0 to 7.5 feet: SILTY SAND with GRAVEL (SM); brown; 30% fines, medium plasticity; 50% sand; 20% gravel; medium dense; trace organics and cobbles; moist.

7.5 to 32.0 feet: CLAYEY SAND with GRAVEL (SC); brown; 30% fines, medium plasticity; 50% sand; 20% gravel; loose; trace cobbles; moist to wet.

@ 10.0 feet: medium dense.

@ 15.0 feet: loose.

@ 16.0 feet: increase in cobbles.

@ 19.0 feet: boulder.

CDA BOREHOLE W/RECON SCREEN W:\GINT\GINT\PROJECTS\0350.04.01\BORING LOGS.GPJ 4/22/22



MAUL FOSTER ALONG I

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B6Sheet
2 of 3

Sample Data

Soil Description

Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method Screen Int	Sample ID	PI/D (ppm)	Lithologic Column	Soil Description
21			CB	B6-S-21	0.0		
22		100					
23					0.0		
24							
25			CB				@ 25.0 feet: moist.
26							
27		100			0.0		
28							
29							
30			CB				@ 30.0 feet: medium dense.
31				B6-S-31	0.0		
32		100					32.0 to 43.0 feet: CLAYEY SAND with GRAVEL and COBBLES (SC); grayish brown; 30% fines, medium plasticity; 40% sand; 20% gravel; 10% cobble; medium dense; moist.
33					0.0		
34							
35			CB				
36							
37		100			0.0		
38							@ 38.0 feet: wet.
39							
40	▽		CB				
41		100		B6-S-41	0.0		
42							

CDA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0350.04.01\BORING LOGS.GPJ 4/22/22



MAUL FOSTER ALONGI

Geologic Borehole LogProject Number
M0350.04.001Boring Number
B6Sheet
3 of 3

Sample Data										Soil Description	
Depth (feet bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Screen Int.	Sample ID	PID (ppm)	Lithologic Column			
43										@ 42.0 feet: moist.	
44		100				B6-W-45 B6-W-45-DUP	0.0			43.0 to 44.0 feet: CLAY with SAND (CH); reddish brown; 80% fines, high plasticity; 20% sand; trace gravel; moist.	
45				CB						44.0 to 51.5 feet: SILTY SAND with GRAVEL and COBBLES (SM); grayish brown; 30% fines, medium plasticity; 40% sand; 20% gravel; 10% cobble; very dense; moist.	
46											
47							0.0				
48		100									
49											
50						B6-S-49.5	0.0				
51		0		SS							

Total Depth = 51.5 feet bgs

NOTES:

1. bgs = below ground surface. 2. Depths are relative to feet bgs. 3. PID = photoionization detector. 4. ppm = parts per million.

Borehole Completion Details

0 to 51.5 feet: 6-inch borehole.

Reconnaissance Well Completion Details

2-inch diameter temporary polyvinyl chloride screen set from 40.0 to 50.0 feet bgs, indicated by dashed graphic in the interval column.

Borehole Abandonment Details

0 to 51.5 feet: Bentonite chips hydrated with potable water.

▽ Water level measurement is 40.0 feet bgs, measured after temporary well installation.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B7Sheet
1 of 2

Project Name Port of Skamania County: Cascades Business Park

Project Location Coyote Ridge Road, North Bonneville, WA

Start/End Date 2/10/2022 to 2/10/2022

Driller/Equipment Holt Services, Inc./Sonic TSi 150CC Track-mounted drill rig

Geologist/Engineer E. Hess, LHG

Sample Method Core Barrel

Surface Elevation (feet)

Northing

Easting

Total Depth of Borehole

36.5 feet

Outer Hole Diam

6 inch

Sample Data

Soil Description

Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method Screen Int.	Sample ID	PID (ppm)	Lithologic Column	Soil Description
1	▽		CB				0 to 1.0 feet: SILTY SAND with GRAVEL (SM); brown; 30% fines, medium plasticity; 50% sand; 20% gravel; trace organics; moist.
2		100		SDU-S-0-5	0.0		1.0 to 4.0 feet: boulder.
3							
4							4.0 to 5.0 feet: SILTY SAND with GRAVEL (SM); brown; 30% fines, medium plasticity; 50% sand; 20% gravel; trace organics; moist.
5			CB				5.0 to 6.5 feet: SILT (ML); gray; 100% fines, low plasticity; wet.
6							
7		100		SDU-S-5-10	0.0		6.5 to 10.0 feet: SANDY CLAY with GRAVEL (CL); brownish gray; 50% fines, medium plasticity; 30% sand; 20% gravel; medium stiff; moist to wet.
8							
9							
10			CB				10.0 to 15.0 feet: SILTY SAND with GRAVEL (SM); brown; 30% fines, medium plasticity; 50% sand; 20% gravel; loose; wet.
11				B7-S-11	0.0		
12		100			0.0		
13							
14							
15			CB				15.0 to 33.0 feet: SILTY SAND with GRAVEL and COBBLES (SM); gray; 30% fines, medium plasticity; 40% sand; 20% gravel; 10% cobble; loose; moist to wet.
16							
17		100			0.0		
18							
19							
20							

CDA BOREHOLE W/RECON SCREEN W:\GINT\GINT\PROJECTS\0350.04.01\BORING LOGS.GPJ 4/22/22



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B7Sheet
2 of 2

Sample Data										Soil Description	
Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Screen Int.	Sample ID	PID (ppm)	Lithologic Column			
21										@ 20.0 feet: moist.	
22											
23		100					0.0				
24											
25											
26										@ 25.0 feet: trace wood fragments; wet.	
27											
28		100					0.0			@ 27.0 feet: moist.	
29											
30											
31										@ 30.0 feet: trace wood fragments.	
32											
33		100									
34										33.0 to 36.5 feet: SANDY SILT with GRAVEL (SM); gray; 50% fines, medium plasticity; 30% sand; 20% gravel; hard; wet.	
35											
36		100					0.0				

Total Depth = 36.5 feet bgs

NOTES:

1. bgs = below ground surface. 2. Depths are relative to feet bgs. 3. PID = photoionization detector. 4. ppm = parts per million.

Borehole Completion Details

0 to 36.5 feet: 6-inch borehole.

Reconnaissance Well Completion Details

2-inch diameter temporary polyvinyl chloride screen set from 15.0 to 35.0 feet bgs, indicated by dashed graphic in the interval column.

Borehole Abandonment Details

0 to 36.5 feet: Bentonite chips hydrated with potable water.

▽ Water level measurement is 1.1 feet bgs, measured after temporary well installation.

CDA BOREHOLE WIRECON SCREEN W:\GINT\GINTW\PROJECTS\0350.04.01\BORING LOGS.GPJ 4/22/22



MAUL FOSTER ALONGI

Geologic Borehole LogProject Number
M0350.04.001Boring Number
B8Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/9/2022 to 2/9/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Sample Data		Lithologic Column	Soil Description
					Sample ID	PID (ppm)		
1				GP				0 to 1.0 feet: GRAVELLY SILT (ML); medium brown; 60% fines, non-plastic; 10% sand, very fine- to medium-grained; 30% gravel, fine- to medium-grained; trace rootlets; soft; moist.
2						0.0		1.0 to 4.25 feet: SILTY GRAVEL (GM); medium gray-brown; 30% fines, non-plastic; 10% sand, very fine- to fine-grained; 60% gravel, medium- to very coarse-grained; slight odor; loose; moist.
3		80			NDU-S-0-5	0.0		
4								
5				GP		0.1		4.25 to 4.5 feet: ASPHALT; black; slight odor.
6						0.0		4.5 to 6.0 feet: SANDY SILT (ML); gray-brown; 70% fines, non-plastic; 20% sand, very fine- to fine-grained; 10% gravel, fine- to medium-grained; pockets of green discoloration; very stiff; moist.
7						0.0		6.0 to 7.0 feet: SILTY GRAVEL (GM); gray; 20% fines, non-plastic; 80% gravel, fine- to very coarse-grained; loose; dry.
8		70			NDU-S-5-10	0.0		7.0 to 10.0 feet: SILTY GRAVELLY SAND (SM); yellow-brown; 20% fines, non-plastic; 60% sand, very fine- to medium-grained; 20% gravel, fine- to coarse-grained, subangular to subrounded; trace very coarse gravel; dry.
9								
10								@ 9.75 feet: brick fragments.

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B9Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/9/2022 to 2/9/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data						Soil Description	
Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column	
1			GP	NDU-S-0-5	0.0		0 to 1.5 feet: GRAVELLY SILT (ML); medium brown; 60% fines, low plasticity; 10% sand, very fine- to fine-grained; 20% gravel, fine- to coarse-grained; trace very coarse gravel and rootlets; stiff; moist.
2		80					1.5 to 4.5 feet: SILTY GRAVEL (GM); medium gray-brown; 30% fines; 10% sand, very fine to fine grained; 60% gravel, medium- to very coarse-grained; loose; moist.
3					0.0		
4				NDU-S-5-10	0.0		4.5 to 6.0 feet: SANDY SILT (ML); gray-brown; 70% fines, non-plastic; 20% sand, very fine- to fine-grained; 10% gravel, fine- to medium-grained; stiff; moist.
5			GP				6.0 to 6.5 feet: SILTY GRAVEL (GM); gray; 20% fines, non-plastic; 80% gravel, fine- to very coarse-grained; loose; moist.
6					0.0		6.5 to 10.0 feet: SILTY SAND (SM); yellow-brown; 20% fines, non-plastic; 60% sand, very fine- to medium-grained; 20% gravel, fine- to coarse-grained, subangular to subrounded; dry.
7		80					
8							
9							
10							@ 9.75 feet: very coarse gravel.

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole LogProject Number
M0350.04.001Boring Number
B12Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Sample Data		Lithologic Column	Soil Description
			Collection Method	Sample ID		
1			GP			0 to 2.0 feet: GRAVELLY SANDY SILT (ML); medium brown; 40% fines, low plasticity; 30% sand, very fine- to fine-grained; 30% gravel, fine- to coarse-grained, subangular to subrounded; trace rootlets and very coarse gravel, subangular to subrounded; soft; moist.
2		40		NDU-S-0-5		2.0 to 2.25 feet: cobble.
3						2.25 to 6.0 feet: SILTY GRAVEL (GM); gray-brown; 20% fines, non-plastic; 80% gravel fine to very coarse; loose; moist.
4						
5			GP			
6						
7		80		NDU-S-5-10		6.0 to 10.0 feet: SILTY GRAVEL (GM); yellow-brown; 20% fines, non-plastic; 60% sand, very fine- to medium-grained; 10% gravel, fine- to coarse-grained; subangular to subrounded; trace very coarse gravel; dry to moist.
8						
9						@ 8.5 feet: dark reddish brown.
10						

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B13Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data							Soil Description	
Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column		
1			GP				0 to 3.0 feet: SANDY SILT (ML); medium gray-brown; 50% fines, low plasticity; 30% sand, very fine- to fine-grained; 20% gravel, fine- to coarse-grained, subangular to subrounded; trace rootlets; soft; moist.	
2					0.0		@ 1.5 feet: firm.	
3		90		NDU-S-0-5			@ 2.5 feet: increase in gravel.	
4					0.9		3.0 to 3.25 feet: ASPHALT; black; slight petroleum-like odor; moist.	
5							3.25 to 6.0 feet: SILTY SAND (SM); medium gray-brown; 30% fines, low plasticity; 40% sand, very fine- to medium-grained; 30% gravel, fine- to coarse-grained; dense; moist.	
6			GP		0.0			
7							6.0 to 8.5 feet: SILTY SAND (SM); blue-gray; 30% fines, low plasticity; 50% sand, very fine- to medium-grained; 20% gravel, fine- to medium-grained; dense; moist.	
8		100		NDU-S-5-10	0.0			
9							8.5 to 10.0 feet: SANDY SILT (ML); medium brown; 70% fines, medium to high plasticity; 20% sand, fine- to medium-grained; 10% gravel, fine- to medium-grained; trace woody debris; stiff; moist.	
10					0.0		@ 9.0 feet: orange mottling. @ 9.5 feet: very dark brown.	

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B14Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data										Soil Description	
Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Screen Int.	Sample ID	PID (ppm)	Lithologic Column			
1				GP			0.0			0 to 4.5 feet: GRAVELLY SILT (ML); medium brown; 60% fines, low plasticity; 10% sand, very fine- to fine-grained; 30% gravel, fine- to coarse-grained; trace very coarse gravel and rootlets; stiff, moist.	
2											
3		60				NDU-S-0-5				@ 2.5 feet: six-inch-thick cobble.	
4											
5				GP			0.0			4.5 to 7.5 feet: SILTY SAND (SM); medium brown; 20% fines; 60% sand, fine- to medium-grained; 20% gravel, fine- to medium-grained, subrounded; trace very coarse gravel; medium density; moist.	
6											
7							0.1			@ 6.5 feet: increase in gravel; wet.	
8		80		GRAB		B14-S-7 NDU-S-5-10				7.5 to 8.5 feet: GRAVEL (GP); gray; 100% gravel, coarse to very coarse; dry.	
9											
10				GRAB		B14-S-9	1.5			8.5 to 10.0 feet: GRAVELLY SAND with SILT (SP-SM); dark gray; 20% fines; 40% sand, very fine- to fine-grained; 40% gravel, fine- to coarse-grained; trace very coarse gravel; petroleum-like odor, no sheen; moist.	

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Reconnaissance Well Completion Details

2-inch diameter temporary polyvinyl chloride screen set from 5.0 to 10.0 feet bgs, indicated by dashed graphic in the interval column.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B17Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data				Soil Description			
Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column	
1			GP				0 to 2.5 feet: SILT (ML); medium gray-brown; 80% fines, low plasticity; 10 sand, very fine- to fine-grained; 10% gravel, fine-grained; trace mica and rootlets; firm; moist.
2							
3		60		NDU-S-0-5	0.0		2.5 to 3.0 feet: GRAVEL (GP); gray; 100% gravel, coarse- to very coarse-grained; rock layer.
4							3.0 to 10.0 feet: SILTY SAND (SM); medium dark brown; 20% fines; 60% sand, fine- to medium-grained; 20% gravel, fine- to coarse-grained; trace very coarse gravel and mica; loose; moist.
5			GP				
6							
7							
8		100		NDU-S-5-10	0.0		
9					0.0		@ 9.0 feet: gray; wet.
10							

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole LogProject Number
M0350.04.001Boring Number
B19Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data						Soil Description	
Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column
1				GP			0 to 1.0 feet: SANDY SILT (ML); medium brown; 70% fines, low plasticity; 20% sand, very fine- to fine-grained; 10% gravel, fine- to medium-grained; trace mica and rootlets; soft; moist.
2							1.0 to 3.5 feet: SANDY SILT (ML); medium gray brown; 50% fines, low to medium plasticity; 30% sand, fine- to medium-grained; 20% gravel, fine- to coarse-grained, subrounded; trace rootlets, woody debris, and very coarse gravel, subrounded; firm; moist.
3		100			SDU-S-0-5	0.0	
4							3.5 to 10.0 feet: SANDY SILT (ML); medium gray-brown; 70% fines, medium plasticity; 20% sand, very fine- to fine-grained; 10% gravel; trace mica, woody debris, and coarse gravel, subrounded; firm; moist.
5				GP			
6							
7							@ 7.0 feet: nail.
8		100			SDU-S-5-10	0.0	@ 8.0 feet: wet; dark gray.
9						0.0	
10							@ 10.0 feet: plywood debris.

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole LogProject Number
M0350.04.001Boring Number
B22Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data							Soil Description
Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column	
1			GP				0 to 10.0 feet: SILTY SAND (SM); medium brown; 40% fines, low plasticity; 50% sand, fine- to medium-grained; 10% gravel, fine- to medium-grained; trace coarse gravel; moist. @ 5.0 feet: wet; gray-brown.
2							
3		60		SDU-S-0-5	0.0		
4							
5			GP				
6							
7							
8		100		SDU-S-5-10	0.0		
9							
10							

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole LogProject Number
M0350.04.001Boring Number
B23Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Sample Data							Soil Description	
Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column		
1			GP		0.0		0 to 2.5 feet: SANDY SILT (ML); medium brown; 50% fines, low plasticity; 30% sand, fine- to medium-grained; 20% gravel, medium- to coarse-grained; trace rootlets and very coarse gravel; moist.	
2								
3		80		SDU-S-0-5			2.5 to 10.0 feet: SILTY SAND (SM); medium brownish gray; 30% fines, non-plastic; 60% sand, very fine- to medium-grained; 10% gravel, fine- to medium-grained; trace very coarse gravel; moist.	
4								
5			GP		0.0			
6								
7							@ 6.5 feet: cobble.	
8		80		SDU-S-5-10	0.0			
9								
10								

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001Boring Number
B24Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
 Project Location **Coyote Ridge Road, North Bonneville, WA**
 Start/End Date **2/10/2022 to 2/10/2022**
 Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
 Geologist/Engineer **S. Colee**
 Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
 Northing
 Easting
 Total Depth of Borehole **10.0 feet**
 Outer Hole Diam **2.25 inch**

Depth (feet, bgs)	Water Levels	Interval	Percent Recovery	Sample Data		Lithologic Column	Soil Description
				Collection Method	Sample ID		
1				GP			0 to 2.5 feet: SANDY SILT (ML); medium brown; 50% fines, low to medium plasticity; 30% sand, very fine- to fine-grained; 20% gravel, fine- to coarse-grained; trace rootlets and very coarse gravel; firm; moist.
2							
3		70			SDU-S-0-5		2.5 to 7.0 feet: SILTY GRAVEL (GM); gray-brown; 20% fines; 10% sand, very fine- to fine-grained; 70% gravel, medium- to very coarse-grained; loose; moist.
4							
5				GP			
6							
7							
8		90			SDU-S-5-10		7.0 to 10.0 feet: SILT with SAND (ML); gray; 60% fines, medium plasticity; 20% sand, very fine- to fine-grained; 20% gravel, fine- to very coarse-grained; firm; moist.
9							
10							

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.



MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number
M0350.04.001

Boring Number
B26

Sheet
1 of 1

Project Name **Port of Skamania County: Cascades Business Park**
Project Location **Coyote Ridge Road, North Bonneville, WA**
Start/End Date **2/10/2022 to 2/10/2022**
Driller/Equipment **Pacific Soil and Water/AMS 9130-VTR**
Geologist/Engineer **S. Colee**
Sample Method **Direct Push, Macrocore**

Surface Elevation (feet)
Northing
Easting
Total Depth of Borehole **10.0 feet**
Outer Hole Diam **2.25 inch**

Sample Data							Soil Description
Depth (feet, bgs)	Water Levels	Interval Percent Recovery	Collection Method	Sample ID	PID (ppm)	Lithologic Column	
1			GP				0 to 8.0 feet: SANDY SILT (ML); medium brown; 40% fines, non-plastic; 40% sand, fine- to medium-grained; 20% gravel, fine- to coarse-grained; trace rootlets; moist.
2							
3		50		SDU-S-0-5			
4					0.0		
5			GP				8.0 to 10.0 feet: SILTY SAND (SM); blue-gray; 30% fines, non-plastic; 50% sand, fine- to medium-grained; 20% gravel, fine- to coarse-grained; trace very coarse gravel; moist.
6							
7							
8		40		SDU-S-5-10			
9					0.0		
10							

Total Depth = 10.0 feet bgs

NOTES:

1. bgs = below ground surface. 2. PID = photoionization detector. 3. ppm = parts per million. 4. No water level recorded in boring; groundwater not sampled.

Borehole Completion Details

0 to 10.0 feet: 2.25-inch borehole.

Borehole Abandonment Details

0 to 10.0 feet: Bentonite chips hydrated with potable water.

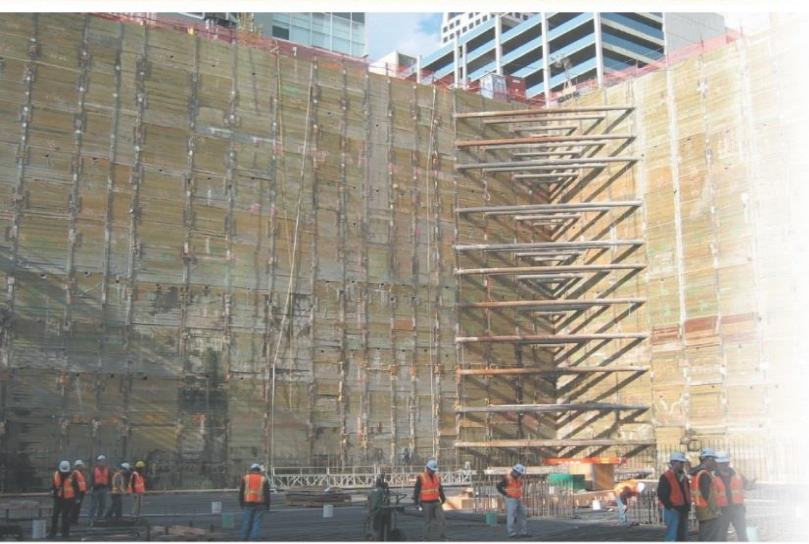
APPENDIX B

GEO TECHNICAL REPORT





**REPORT ON
CASCADE BUSINESS PARK PRELIMINARY
GEOTECHNICAL SITE EVALUATION
NORTH BONNEVILLE, WASHINGTON**



by
Hart Crowser, a division of Haley & Aldrich
Vancouver, Washington



for
Maul Foster Alongi, Inc.
Vancouver, Washington

File No. 0203059-000
May 2022



4 May 2022
File No. 0203059-000

Maul Foster Alongi, Inc.
109 East 13th Street
Vancouver, Washington 98660

Attention: Mr. Ben Johnson

Subject: Cascade Business Park Preliminary Geotechnical Site Evaluation
North Bonneville, Washington

Ladies and Gentlemen:

Enclosed is our preliminary geotechnical site evaluation report for the proposed Cascade Business Park development to be located east of Cascade Drive and south of State Route 14 in North Bonneville, Washington. The approximately 42-acre project site is located at approximate coordinates of 45.641° North latitude and 121.964° West longitude.

Our understanding of the proposed project is based on project drawings and discussions with Maul Foster Alongi, Inc. The conceptual development plans include construction of up to nine buildings ranging from 12,000 to 60,000 square feet (SF), driveways and parking lots, and a boat parking area. The buildings are expected to be mixed-use with possible uses including a hotel, light industrial, retail/commercial, restaurants/breweries, etc. Total square footage of buildings is expected to be between 200,000 and 300,000 SF. The current conceptual plans shows up to five buildings, including a hotel, in the southwestern half of the site and the remainder in the northeastern portion. Pad grades in the southwest are elevated approximately 20 to 30 feet higher than pad grades in the northeastern area.

Based on available geotechnical data, subsurface conditions at the site typically consist of loose to dense artificial fill (exceeding 40 feet in thickness in places) overlying very dense and hard native materials at depth. The primary geotechnical issues affecting the design and construction of the planned development include seismic shaking, seismic settlement, slope stability, settlement under static loading, stormwater infiltration, and earthwork considerations pertaining to the presence of cobbles and boulders in the artificial fill. Preliminary recommendations for structure foundations include shallow spread footings, potentially bearing on a zone of ground improvement to mitigate seismic settlement hazards. Our preliminary recommendations regarding foundations, site grading, and other geotechnical aspects of this project are presented in this report. These preliminary recommendations are intended to support initial design efforts for the proposed development; design-level geotechnical exploration(s) likely including additional subsurface exploration will be necessary for final design of proposed structures.

Maul Foster Alongi, Inc.

May 4 2022

Page 2

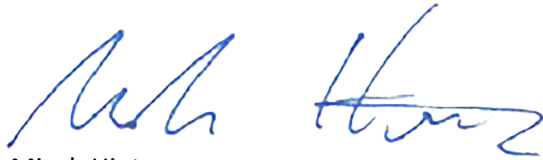
We appreciate the opportunity to provide our services to you on this project. If you have any questions, please call.

Sincerely yours,

HART CROWSER, A DIVISION OF HALEY & ALDRICH



Lauren K. Phillips, PE
Senior Staff Engineer



Micah Hintz
Project Manager



Daniel J. Trisler, PE
Principal Geotechnical Engineer

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1. Introduction

Hart Crowser, a division of Haley & Aldrich (Haley & Aldrich), is pleased to present this report to Maul Foster Alongi, Inc. (MFA) describing our preliminary review of geotechnical conditions at the Cascade Business Park site in North Bonneville, Washington. The approximately 42-acre, triangular-shaped project site is located on the north bank of the Columbia River approximately 30 miles upstream from Portland, Oregon, and is bound by Evergreen Highway (State Route 14) to the north, Fort Cascades Drive to the south and east, and residential properties to the west. Our work was performed in general accordance with the Subcontractor Work Order Authorization dated 21 October 2021.

This report contains the results of our analysis and provides recommendations for design and construction of the proposed development. The first section of this report provides an overview of the project. The main body of the report presents our preliminary geotechnical engineering findings and recommendations in detail. Figures are presented at the end of the text. The location of the site is shown on Figure 1; the existing site layout and topography with the location of our explorations is shown on Figure 2, and the conceptual layout of the proposed development is shown on Figure 3. Supporting information is provided in the appendices. Appendix A contains site subsurface exploration logs and Appendix B contains the results of laboratory testing completed for our analysis. Appendix C includes boring logs and laboratory test data from previous explorations by others.

1.1 PROJECT UNDERSTANDING

We understand that MFA is assisting the city of North Bonneville with master planning for development of the Cascade Business Park site. Our understanding of the proposed site layout is based on our discussions with MFA and review of conceptual drawings prepared by MFA, including the undated, "Figure 1 Grading Exhibit, Cascade Business Park, North Bonneville, Washington," and, "Cascade Business Park Conceptual Site Planning, Site Plan D," with issue date 4 May 2021. These documents depict a proposed development consisting of up to nine buildings, driveways and parking lots, and a boat parking area. The buildings are expected to be mixed-use with possible uses including a hotel, light industrial, retail/commercial, and restaurants/breweries. Total square footage of the buildings is expected to be between 200,000 and 300,000 square feet. The current plan shows up to five of the proposed buildings, including the hotel, within the elevated southwestern half of the site, where proposed pad grades roughly range from Elevation 85 feet (El. 85) to El. 90 (NAVD 88). The remaining structures are planned within the northeastern portion of the site, with proposed pad grades ranging between El. 60 and El. 65.

1.2 SITE HISTORY

The site was used as grazing land prior to the mid-1970s, when it was purchased by the U.S. Army Corps of Engineers (COE), and subsequently cleared of vegetation. During construction of the Bonneville Lock and Dam Second Powerhouse between 1976 and 1982, the site was used for storage, washing, maintenance, and staging of construction equipment. Between 1981 and 1982, the site was also used as a disposal area for over one million cubic yards of excavated materials, predominantly consisting of dredge spoils excavated from the widening of the northernmost channel of the Columbia River and concrete rubble from the temporary cofferdams. This stockpile of material covers the majority of the site and extends between approximately 10 and 50 feet above surrounding native grades, as shown on Figure 2.

Between 1992 and 1994, the COE investigated potential contamination of onsite soils caused by leaks and spills during the site's prior use as a contractor staging and vehicle maintenance area. Petroleum-containing soils were subsequently removed, and in 1997, the Washington Department of Ecology determined that no further action (NFA) was necessary. Subsurface explorations performed after the NFA judgment revealed buried debris and other materials deemed recognized environmental concerns (RECs). These hazards are discussed in detail in, "Phase I Environmental Site Assessment, Cascade Business Park, Skamania County Parcel Number 02072000020500, North Bonneville, Washington 98639," prepared by MFA and dated 28 July 2020.

Structures formerly present at the site during construction of the dam improvements have been demolished, with the exception of a large concrete pad present near the northeastern corner of the site.

The existing asphalt-paved Coyote Ridge roadway was constructed in 2012, connecting Cascades Drive to Fort Cascades Drive, and roughly bisecting the site into northeastern and southwestern portions.

2. Scope of Services

This preliminary geotechnical site evaluation was performed to obtain geotechnical information on subsurface conditions at the site and to develop preliminary geotechnical design recommendations for the subject project. Specifically, our scope of services included the following tasks:

- Reviewed relevant, readily available geologic maps and geotechnical reports that cover the site vicinity and nearby to evaluate geologic hazards, regional soil mapping, and local soil and groundwater conditions.
- Conducted a limited subsurface investigation consisting of the following:
 - Two borings advanced to depths of approximately 50 and 35 feet below ground surface (bgs) using sonic drilling methods;
 - Eight test pits advanced to depth between 10 and 11 feet bgs using a backhoe; and
 - Three infiltration tests.
- Completed a limited program of lab testing that included three grain size analyses, eight moisture content tests, and two fines content tests.
- Evaluated seismic design criteria and preliminarily identified seismic hazards, including ground shaking, ground shaking amplification, and liquefaction.
- Conducted preliminary engineering analyses of settlement, bearing capacity, slope stability, and infiltration.
- Developed conceptual recommendations for foundation alternatives, ground improvement, retaining walls, infiltration systems, and building set-backs.
- Evaluated preliminary construction considerations for earthworks, foundations, retaining walls, pavements, and infiltration systems.
- Prepared this report summarizing our findings and preliminary conclusions and recommendations.

3. Site Conditions

3.1 GEOLOGY AND SOIL MAPPING

3.1.1 Geologic Mapping

Geology in the vicinity of the proposed project site is mapped in the Washington Geologic Information Portal at the 1:100,000 scale. The geology of the site has been mapped as Quaternary alluvium. The alluvial deposits are described as unconsolidated or semiconsolidated and are composed of clay, silt, sand, gravel, and cobbles. Mapping indicates that locally the surficial geology may include modified land and artificial fill (Washington State Department of Natural Resources, 2002).

Based on our review of the United States Geological Survey's Quaternary Fault and Fold Database of the United States, mapped faults near the site include the Eagle Creek Thrust Fault located 5 miles south of the site, the "Faults near The Dalles" located 17 miles east of the site, and Lacamas Lake Fault located 19 miles west of the site. The Cascadia Subduction Zone (referred to in the database as the Cascadia fold and fault belt) is mapped as close as 120 miles west of the site.

3.1.2 Soils Mapping

The near-surface native soils at the site are mapped in the U.S. Department of Agriculture (USDA) web soil survey (USDA 2018). The survey indicates that the surficial soils at the site consist primarily of Pilchuck very fine sandy loam (0 to 3 percent slopes), with Arents (0 to 5 percent slopes) mapped along the south-eastern edge of the site, along Fort Cascades Drive. The Pilchuck soils are described as fine sandy loam and loamy sand derived from flood plain deposits with an estimated hydraulic conductivity in the most restrictive layer of high (approximately 1.98 to 5.95 inches per hour) and are described as somewhat excessively drained. The Arents soils are described as gravelly sandy loam derived from terraces. The Arents soils have an estimated hydraulic conductivity in the most limiting layer of moderately high to high (approximately 0.57 to 5.95 inches per hour) and are described as well-drained.

3.2 SURFACE CONDITIONS

The ground surface at the site is generally uneven and largely covered in grass with few trees. Coyote Ridge, an asphalt-paved road constructed onsite in 2012, traverses the site in a z-shaped alignment, starting from Cascade Drive in the northwest corner and ending at Fort Cascades Drive along the southeastern site boundary. Boulders and concrete debris are present at the surface in localized areas across the site. A paved pad with approximate dimensions of 150 feet by 85 feet is located in the northeast corner of the site.

Fill soils from construction of the Bonneville Dam are present at the site, forming a large mound that has mostly remained undisturbed for the last approximately 40 years. This mound reaches its greatest elevation in the western portion of the site, reaching a high point of approximately El. 103. The mound steps down to the northeast of Cascade Drive to El. 70. The natural ground elevations are approximately El. 40 along the south side of the site adjacent to Fort Cascades Drive and El. 50 along the north side of the site.

Existing slopes on site range from gradual slopes of 3 horizontal to 1 vertical (3H:1V) or flatter, to steeper slopes of approximately 2H:1V. There are relatively level areas on the southwest and northeast portions of the site where the majority of the proposed buildings are located. The mound on the southwest portion of the site falls off steeply to the west and south at slopes ranging from approximately 3H:1V to 2H:1V. Some of the proposed buildings are located at the top of these slopes.

3.3 SUBSURFACE CONDITIONS

Our understanding of subsurface conditions at the site was developed from interpretation of geologic maps and our explorations, in conjunction with soil properties inferred from field observations and laboratory tests. This understanding of subsurface conditions formed the basis for the conclusions and preliminary recommendations provided in this report.

Subsurface explorations performed at the site include the current exploration program performed by Haley & Aldrich in February 2022, and four other geotechnical and environmental exploration programs performed onsite by others between 1989 and 2012 (Appendix A). The approximate locations and designations of the previous and current subsurface explorations are shown on Figures 2 and 3. The following serves as a summary of these various exploration programs:

1990 Hamilton Island Site Inspection Study (Army Corps of Engineers)

- Two exploratory borings (designated DH12 and DH14) were drilled onsite to depths ranging from 19.5 to 46 feet bgs.

1994 Parcels 2 and C Environmental Baseline Study (Woodward-Clyde Consultants)

- Four exploratory borings (designated SB1 through SB4) were drilled to depths ranging from 27 to 36.5 feet bgs, using an air-rotary drill rig;
- Three monitoring wells (designated MW1 through MW3) were drilled to depths ranging from 26.5 to 49 feet bgs, using an air-rotary drill rig; and
- Sixteen test pits (designated in this report as WC-TP1 to WC-TP16) were excavated to depths of 4 to 15 feet bgs using a track-mounted backhoe.

2001 Test Pit Exploration (Squier Associates)

- Eight test pits (designated in this report as SA-TP-1 through SA-TP-8) were excavated to depths of 5 to 23 feet bgs using a track-mounted excavator.

2012 Geotechnical Site Investigation for Flexible Pavement Design (Columbia West Engineering)

- Eleven test pits (designated in this report as CW-TP-1 through CW-TP-11) were excavated to depths of 3.5 to 12 feet bgs using a track-mounted excavator, at locations along Coyote Ridge and near the western site limits.

2022 Preliminary Exploration Program (Haley & Aldrich)

- Two exploratory boring (designated B-06 and B-07) were drilled to depths of 36.5 and 51.5 feet bgs, using a truck-mounted sonic drill rig;

- Eight test pits (designated TP-01 through TP-08) were excavated to depths of 10 to 11 feet bgs using a track-mounted backhoe; and
- Three shallow infiltration tests (designated IT-1 through IT-3) were performed to test the rate of hydraulic conductivity of the soils within the upper 1 to 3 feet of the site.

The approximate locations of the borings, monitoring wells, test pits, and infiltration tests are indicated on Figures 2 and 3.

3.3.1 Soils

Subsurface conditions at the site are typically defined by a thick layer of artificial fill overlying native alluvial materials. Boring B-06 encountered loose to medium dense fill material to a depth of approximately 44 feet bgs before encountering native materials near El. 53. Boring B-07 did not encounter native material, with fill above El. 59 at this location primarily consisting of loose to medium dense silty sand with variable quantities (sometimes significant) of gravel, cobbles, and boulders. All eight test pits encountered fill materials, typically composed of silty sand with gravel and cobbles in addition to boulders up to 2 feet in largest dimension, petrified wood, and brick debris.

Moisture contents in the fill encountered at borings B-06 and B-07 ranged from 11 to 19 percent. Fines content of the fill ranged from 17 to 28 percent.

Fill encountered in historical borings by the Army Corps of Engineers and Woodward Clyde Consultants was typically described as silty gravel with cobbles and silty sand with gravel. Historical boring logs often report high sampling blow counts and corresponding descriptions of the fill as dense to very dense; however, these high blow counts are coupled with low sample recovery and descriptions of medium to coarse gravel, cobbles, and boulders within the fill, suggesting that the blow counts may be partially attributed to the presence of oversize material rather than the density of the fill materials. Many borings also encountered occasional seams of silt and clay up to 3 feet thick in the fill material.

Below the fill material, native soils consisting of dense to very dense silty sand and sandy gravel and hard clayey silt and sandy silt with gravel extended to the bottom of boring B-06. Cobbles were also encountered in the native soils. Data presented in the Woodward Clyde report, notably cross section A-A', suggests that the fill-native contact in the central to southwestern portion of the site is expected to be present between El. 50 and El. 60.

3.3.2 Groundwater

Depth to groundwater appears variable across the site. Boring B-06 encountered perched groundwater at a depth of 40.6 feet bgs (approx. El. 56), several feet above an approximately 1-foot-thick layer of fat clay. Perched groundwater at B-07 was encountered at a depth of just 1.2 feet bgs, several feet above a lean clay layer. Seepage was noted at a depth of 7 feet at test pit TP-01 during the current field exploration.

Historical boring and test pit logs reported encountering water at various elevations. Columbia West test pits TP-2 and TP-3 encountered free water at El. 44 and El. 55, respectively, while the other nine test pits performed during that study did not encounter free water. Woodward Clyde borings MW2 and MW3 reported free water near El. 54 and El. 80, respectively; test pits TP8, TP9, and TP12 from this study reportedly encountered seepage near El. 53, El. 54, and El. 49, respectively. Most of the reported free

water and seepage elevations are within several feet of the interpreted fill-native contact, suggesting that several feet of perched water may typically be present near this contact across the site. As many of the test pits and borings did not report free water at or below these elevations, these instances of free water are not interpreted to signify a regional groundwater table.

The deepest stabilized groundwater level at the site was encountered at monitoring well MW-1, which was constructed with a base elevation of El. 11 on 28 January 1993. A stabilized groundwater measurement collected approximately one month after installation on 25 February 1993 reported a groundwater elevation of approximately El. 17. We interpret that the site groundwater table is at approximately El. 17, and that groundwater instances recorded at higher elevations in other onsite explorations are perched layers resting over localized, less-permeable soil layers of clay and silt.

3.3.3 Infiltration

We performed three in situ infiltration tests at the project site. The tests were completed in shallow test holes advanced adjacent to select test pits. The infiltration tests consisted of open-hole, falling head test. The results of the field testing and associated fines content and soil type of tested soils are provided in Table I. The drawdown values presented in Table I are not to be used for design but are provided to show the direct results of the field measurement.

Table I. Infiltration Test Data					
Infiltration Test No.	Test Pit No.	Approximate Test Depth (feet)	Field Drawdown Rate (inches/hour)	Soil Type (USCS)	Fines Content (percent)
IT-1	TP-02	3	0.4	SM	25
IT-2	TP-05	3	0.2	SM	28
IT-3	TP-08	3	0.2	SM	21

3.4 GEOLOGIC AND SEISMIC HAZARDS

3.4.1 Seismic Shaking

We evaluated potential seismic shaking at the site using guidelines presented by ASCE 7-16, as referenced by the currently adopted 2018 International Building Code. Code-based seismic design values for design-level recommendations for the proposed structures may vary if the subsequent version of the ASCE 7 guidelines (ASCE 7-22) is adopted at the time of design.

The expected peak bedrock acceleration having a 2 percent probability of exceedance in 50 years (2,475-year return period) is 0.275g. This value represents the peak acceleration on bedrock beneath the site and does not account for ground motion amplification due to site-specific effects. The peak ground acceleration (PGA) is determined by applying a site class factor to the peak bedrock acceleration. The PGA accounting for site amplification is $PGA_M = 0.365g$. Refer to *Section 4.4.2 Site Classification* for a discussion of ground motion amplification.

We obtained a deaggregation of the seismic sources contributing to the expected peak bedrock acceleration shown above from the United States Geological Survey's Unified Hazard Tool website (USGS 2022). Seismic sources contributing to this potential ground shaking include the shallow crustal faults of the Portland Hills fault system and the Cascadia Subduction Zone (CSZ) megathrust and intraplate sources. The data indicated that the "modal source" for shaking at the site at all potential

periods of interest (0.0 to 2.0) is a magnitude 9.34 quake epicentered at the CSZ approximately 128 kilometers from the site. The modal source generally signifies the earthquake with the highest contribution to the site earthquake hazard, in this instance a rupture along the CSZ.

3.4.2 Site Classification

Thick sequences of unconsolidated, soft sediments typically amplify the shaking of long-period ground motions, such as those associated with subduction zone earthquakes; whereas areas underlain by shallow soil profiles are not likely to amplify seismic waves.

The “Site Class” is a designation used by the 2018 International Building Code (IBC) (ICC 2015) to quantify ground motion amplification. The classification is based on the stiffness in the upper 100 feet of soil and bedrock materials at a site. Artificial fill is present within the upper 20 to 40 feet of subsurface stratigraphy throughout much of the site and is generally characterized by sand and gravel that ranges from loose to dense across the site. The artificial fill is typically underlain by alluvium composed of dense to very dense granular soils and very stiff to hard fine-grained materials. Our explorations did not extend to a depth of 100 feet bgs; however, based on our knowledge of local geologic conditions, it is reasonable to extrapolate the consistency of the materials encountered at the base of the borings to 100 feet. Based on these conditions, the property has a **Site Class D**.

Refer to *Section 5.3 Seismic Design* of this report for additional discussion regarding the recommended site class value for design of structures.

3.4.3 Liquefaction

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles, resulting in the sudden loss of shear strength in the soil. Granular soils, which rely on interparticle friction for strength, are susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upwards, carrying soil particles with the draining water. In general, loose, saturated sand soils with low silt and clay contents are the most susceptible to liquefaction. Silty soils with low plasticity are moderately susceptible to liquefaction under relatively higher levels of ground shaking. For any soil type, the soil must be saturated for liquefaction to occur.

The Washington State Geologic Information Portal website maps the site as having a moderate to high susceptibility to liquefaction.

We performed site-specific liquefaction potential analysis on the materials encountered in our borings, using procedures outlined in Idriss and Boulanger (2014). In accordance with American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures (ASCE 7-16), we completed the liquefaction hazard analysis using the site class adjusted Maximum Considered Earthquake Geometric Mean PGA (PGAM). We used a PGA_M of 0.365 g and associated earthquake magnitude of 9.34 in our analysis. A design groundwater elevation of El. 17 was considered, based on the groundwater level reported at monitoring well MW-1. Based on the depth to the regional groundwater table, within the dense to very dense native alluvial materials, we conclude that the liquefaction hazard within materials submerged by the regional groundwater table is low.

While the loose to dense artificial fill that blankets the site is well above the design groundwater table and is therefore assumed to be unsaturated, much of this material would be subject to liquefaction under saturated conditions. Perched groundwater has been identified at various depths throughout the site during the current and previous subsurface exploration programs, as well as during grading of Coyote Ridge. Fill saturated by perched water may be subject to localized liquefaction and liquefaction-induced settlements. The potential for localized liquefaction settlement should be considered during design-level evaluations for the development.

3.4.4 Cyclic Densification

Seismically induced compaction or densification of non-saturated granular soil (such as sand above the groundwater table) due to earthquake vibrations can result in settlement of the ground surface. The non-engineered artificial fill at the site is largely composed of loose to dense granular soils with potential for susceptibility to cyclic densification.

We evaluated the potential for cyclic densification within the artificial fill logged at borings B-06 and B-07 using the procedure described by Pradel (1998) and incorporating the refinements presented by Yee, Duku, and Stewart (2014). Our analyses indicate that the granular artificial fill present within the upper approximately 40 feet bgs in the western portion of the site may experience cyclic densification on the order of 3 to 6 inches, under seismic shaking from the design earthquake. We assume that fill soils present in the eastern portion of the site are similarly susceptible to cyclic densification, despite relatively high sampling blow counts, which are assumed to be attributed to the presence of gravels and cobbles. As the fill thickness in the eastern region is generally on the order of 20 to 30 feet, we judge that cyclic densification settlements in the eastern area will be on the order of 1 to 2 inches total. Due to uneven composition of the fill and subsurface boring data indicating loose and dense fill profiles within a short distance of one another, we anticipate that the cyclic densification may be variable across the site and manifest with significant differential settlement. We conclude that the potential for cyclic densification at the site is high.

3.4.5 Fault Rupture

There are no mapped earthquake faults passing through or near the site. The nearest mapped faults are the Eagle Creek Thrust Fault located 5 miles south of the site, the “Faults near The Dalles” located 17 miles east of the site, and Lacamas Lake Fault located 19 miles west of the site.

3.5 SLOPE STABILITY

We understand that significant regrading will be completed at the site to accommodate development. In some areas, grades will be raised with new fill and slopes will be made steeper to accommodate the new buildings. Our understanding of proposed grading is based on a topographic site plan of existing conditions and proposed conditions provided by MFA via email on 17 March 2022. The majority of slopes in the proposed grading configuration are at an inclination of 3H:1V (horizontal: vertical) or flatter.

Based on the proposed grading plans, we analyzed a slope profile crossing the site from north to south, passing directly to the east of the proposed 3-story hotel, at the location shown on Figure 2. The stability analyses were performed using RocScience Slide2, a limit-equilibrium software program for analyzing static and pseudostatic (seismic) factors of safety for soil slopes (Rocscience 2020). The slope section

was analyzed using circular searches with Spencer's Method to calculate the factor of safety against sliding. A static factor of safety of 1.5 or greater for slopes analyzed using this method is typically considered adequate for demonstrating stability.

The Bray and Macedo (2019) procedure was used for estimating seismic-induced slope displacements based on probability of exceedance. This procedure is performed by determining the yield acceleration (k_y) of a given slope configuration using limit-equilibrium analysis, selecting a design earthquake magnitude, estimating an initial fundamental period of the sliding mass as a function of critical failure surface height and average shear wave velocity of the subsurface profile, and selection of a design spectral acceleration that corresponds to a period equal to 1.3 times the initial fundamental period.

Preliminary seismic slope evaluation considered a M_w 9.34 event occurring along the Cascadia Subduction Zone, and a slope profile was evaluated to estimate seismic-induced slope displacements at 50-percent and 16-percent (one standard deviation) probabilities of exceedance. Estimated seismic slope displacements are expected to be on the order of 4 inches for the 50-percent exceedance level, and on the order of approximately 10 inches for the 16-percent exceedance level.

Based on the results of our slope stability analysis, site slopes laid back at inclinations no steeper than 3H:1V are generally expected to perform well under static and seismic conditions. *We recommend that design-level geotechnical analyses include supplemental slope stability evaluations where planned inclinations are steeper than 3H:1V and for all structures located near planned or existing slopes.*

4. Conclusions

Based on our explorations, testing, and analyses, it is our opinion that the site is suitable for the proposed development. The following provides a summary of key preliminary geotechnical findings and conclusions.

- Site soils include a thick layer (over 40 feet in places) of loose to dense fill soils predominantly composed of silty and clayey sand and gravel. The fill soils are underlain by dense native soils composed of silty sand with gravel and cobbles. Cobbles and boulders are present in both fill and native soil layers.
- Perched groundwater is present at various depths across the site. Areas of perched groundwater over layers of silt and clay are likely to be encountered during construction. Localized pockets of “confined” water may be encountered where water upwells when exposed (e.g. artesian conditions).
- Due to the loose and variable nature of the fill soils, it is expected that seismic shaking will induce localized liquefaction and/or densification of the soil. Seismically induced settlements of 1 to 6 inches may result from a design-level earthquake.
- We anticipate the soils present at shallow depths beneath the existing ground surface will be suitable for support of conventional building foundations, building floor slabs, and pavements, once prepared and compacted in conformance with geotechnical recommendations.
 - Due to the variable and loose nature of the existing fill, recompaction of 1 to 3 feet of existing fill materials will be required below building foundation/slab and pavement subgrades.
 - The use of interlocking grade beams/footings may be required to reduce potential differential settlement (static and seismic).
 - Ground improvement may be required to increase bearing capacity and limit settlement for select structures and improvements.
- Site soils have low hydraulic conductivity rates and are expected to vary significantly across the site, due to the preponderance of artificial fill. The use of infiltration systems for the disposal of stormwater within thick fill areas may not be feasible. Placement of infiltration systems in native soils areas (at the bases of the fill mounds) will require further study to characterize the infiltration capacity of those materials.
- The on-site native soils are typically suitable for reuse as structural fill, provided they are properly moisture conditioned and oversized materials are removed. We note that:
 - The presence of cobbles and boulders across the site may pose challenges for excavation.
 - The high fines content of the soils may cause them to be easily disturbed during construction. The use of wet soil/weather earthwork practices will likely be required during construction.
- Current conceptual plans show existing slopes being regraded at a 3H:1V inclination, which based on our analysis is expected to be stable in both static and seismic states.

- For planning purposes, we recommend structures be set-back from a 2H:1V projection extending from the toe of nearby slopes. For structures located between 2H:1V and 3H:1V projection, structure-specific stability analysis will be required.
- If existing slopes are left at inclinations steeper than 3H:1V then they should be considered seismically unstable and susceptible to significant sloughing.
- If existing slopes are left at inclinations steeper than 2H:1V then they should be considered both statically and seismically unstable. Structures should not be constructed on or directly adjacent to slopes steeper than 2H:1V.

The following sections present our preliminary design and construction considerations that can be used for initial planning of future development. These guidelines should not be used for final design of future improvements.

5. Preliminary Geotechnical Design Considerations

5.1 FOUNDATIONS

As discussed above, much of the site is underlain by variable (loose to dense) artificial fill that is expected to be subject to significant static and seismic settlements in its current state. Static settlements may feasibly be addressed by performing limited overexcavation and recompaction of subgrade soils to provide an engineered fill subgrade that provides relatively uniform foundation support. However, approximately 1 to 6 inches of seismic settlement is expected to occur across the site.

The preliminary foundation design and construction guidelines provided in this section of the report will help improve the seismic performance of the proposed buildings. The design philosophy behind the IBC (ICC 2018) is that a building will not collapse during a design-level earthquake; however, cosmetic and functional distress will occur, and even structural distress is likely to result, potentially rendering the structures unusable until repaired or replaced. If these performance criteria are not acceptable, we should be notified so we can modify our recommendations.

Based on the results of our investigation, it is our opinion that one- to three-story structures can be supported on conventional spread foundations or mat foundations designed to gain support on a zone of overexcavated and recompacted structural fill (where estimated settlements can be tolerated) or bear on subgrade subjected to ground improvement (where estimated settlements exceed structural tolerances). Furthermore, due to the soil variability, we recommend that spread footings be tied to one another following the criterion outlined in Section 12.13.9 Requirements for Foundations on Liquefiable Sites of ASCE-7-16 (ASCE/SEI 2016).

Preliminary recommendations for spread foundations bearing are discussed below.

5.1.1 Shallow Foundations Bearing on Recompacted Fill

For lightly loaded buildings that are relatively insensitive to settlement, we anticipate that shallow spread footings bearing on recompacted fill can be used.

5.1.1.1 Dimensions and Design Criteria

For preliminary design, we recommend strip footings be designed for a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). The footings should have a minimum width of 1.5 feet. Isolated footings should not be used. All footings should be interconnected with one another following the criterion outlined in Section 12.13.9 of ASCE-7-16 (ASCE/SEI 2016). For the design matrices, the structural engineer may assume that there is 0 inches of lateral spreading displacement and a maximum of 4 inches of differential settlement over a 50-foot span. (Actual settlements may vary from this amount, likely less, however, this value should be used for preliminary planning.)

5.1.1.2 Lateral Resistance

Lateral loads on footings can be resisted by passive earth pressures on the sides of footings and by friction on the bearing surface. We recommend that passive earth pressures be calculated using an

equivalent fluid density of 350 pounds per cubic foot (pcf). We recommend using a friction coefficient of 0.30 for foundations placed on in situ soil or 0.5 for foundations on a minimum 6-inch-thick aggregate base subgrade. The passive earth pressure and friction components may be combined, provided the passive component does not exceed two-thirds of the total. The lateral resistance values do not include safety factors.

5.1.1.3 Subgrade Preparation

The existing fills beneath proposed footings should be removed and/or scarified and recompacted to depths of between 1.5 and 3 feet below base of footing. The reworked area should extend laterally at least 6 to 18 inches beyond all edges of the footings. The exact depth and lateral extent of reworking will be determined in the future based on actual building location, loads, configuration, and supplemental explorations (if completed).

5.1.1.4 Settlement

We estimate that footings bearing on the existing loose to medium dense fill will experience some immediate settlement. For a lightweight, single-story structure, we expect settlement to be on the order of 0.5 inches. For taller, heavier buildings settlement is likely to be in the range of 1 to 2 inches.

As stated previously, seismic-induced cyclic densification may induce an additional 3 to 6 inches of settlement underneath structures in the western portion of the site, and 1 to 2 inches of settlement in the eastern portion.

As noted above, the foundation systems ability to resist and accommodate settlement shall be increased via the use of interlocking footings/grade beams.

5.1.2 Shallow Foundations Bearing on Ground Improvement

For larger, more heavily loaded buildings, or buildings that are sensitive to settlement, we anticipate that ground improvement measures may need to be implemented prior to the installation of shallow spread footings.

5.1.2.1 Ground Improvement Methods

There are multiple ground improvement measures that can be used to improve bearing capacity and mitigate anticipated static and seismic-induced settlements. However, the relatively extensive presence of cobbles and boulders at the site will cause difficulties with most systems. Therefore, the selection of a preferred ground improvement system will best be made during the design for a specific structure, when specialty contractors can be consulted by the project team.

Conceptually, we anticipate that an aggregate pier system (e.g. GeoPiers) will be viable. These systems create a pier filled with aggregate compacted via vibratory or impact action beneath a building pad. The piers densify the *in situ* soil during installation and provide a load-transfer mechanism to reduce loading on the *in situ* soils. Also, while not commonly used in the Pacific Northwest, this site may be suitable to improvement via deep dynamic compaction. Deep dynamic compaction is achieved by subjecting the fill to repeated impacts from a large mass suspended by a crane. The use of deep dynamic compaction is only feasible when other improvements (e.g. buildings) are not located proximate to a

site. Another approach to ground improvement may be deep overexcavation of existing fill and reconstruction of a geogrid-reinforced fill pad beneath a building. Depending upon the building and soil conditions, the overexcavation and fill pad may be 5 to 10 feet thick.

The detailed final design and installation of ground improvement is typically performed by specialty subcontractors, in accordance with performance criteria established by the Owner's Geotechnical Engineer (Haley & Aldrich). Proposals by prospective specialty contractors bidding the work will be reviewed by the Geotechnical Engineer and the respective Structural Engineer for each structure for suitability of the proposed system and compliance with the project requirements.

5.1.2.2 *Dimensions and Design Criteria*

Preliminarily, we recommend anticipate that most ground improvement methods will allow for shallow footings to be designed using an allowable bearing pressure of 4 to 5 kips per square foot (ksf). Continuous footings should be at least 2 feet wide and isolated footings should be a minimum of 3 feet square.

5.1.2.3 *Lateral Resistance*

Lateral resistance of footings may preliminarily be designed per Section 5.1.1.2

5.1.2.4 *Settlement*

The settlement performance of building supported by ground improvements will vary depending upon the system chosen. However, we anticipate most systems will be capable of achieving maximum total and differential static settlements of 1-inch and 1/2-inch over a distance of 50 feet, respectively.

5.2 FLOOR SLABS

We anticipate that most buildings will have concrete slab-on-grade floors. Due to the variable nature of the site soils, we recommend that the upper 12 to 18 inches of soil beneath floor slabs be recompacted, or consist of 12 to 18 inches of new fill over the existing subgrade, to provide a uniform bearing surface.

To reduce water moisture transmission through floor slabs, we recommend installing a capillary moisture break and a water vapor retarder beneath floors. Typically, finished spaces with slab-on-grade floors, such as offices, will utilize capillary moisture breaks and vapor retarders to reduce the potential for water vapor transmission through the floor, which can adversely impact flooring materials and carpeting. Depending upon the depth to perched groundwater and building floor elevations, it is conceivable that a subslab drainage system may be required, particularly if existing grades are lowered and expose perched water.

5.3 SEISMIC DESIGN

We obtained the preliminary design parameters for the spectral acceleration from the U.S. Seismic Design Maps (USGS 2021a) for Latitude 45.6416 and Longitude -121.9651. The parameters provided in Table II are associated with the current code, ASCE 7-16, and are likely to change as the site is developed and ASCE 7-22 is in use.

Table II. Preliminary Seismic Design Values for Site Class D Conditions		
Seismic Parameter	ASCE 7-16 Design Values	ASCE 7-22 Design Values
Site Class	D ¹	D
MCE _R ² Ground Motion (Period = 0.2 seconds), S _s	0.617 g ³	0.62 g
MCE _R Ground Motion (Period = 1.0 seconds), S ₁	0.279 g	0.23 g
Peak Ground Acceleration, PGA	0.275 g	See Note 7
Site Amplification Factor at 0.2 seconds, F _a	1.306	See Note 8
Site Amplification Factor at 1.0 seconds, F _v	See Note 4	See Note 8
Site Amplification Factor for PGA, F _{PGA}	1.325	See Note 7
Site-Modified Peak Ground Acceleration, PGA _M	0.365 g	0.35 g
Site-Modified Spectral Acceleration Value at 0.2 seconds, S _{MS}	0.806 g	0.84 g
Site-Modified Spectral Acceleration Value at 1.0 seconds, S _{M1}	See Note 4	0.55 g
Design Spectral Acceleration at 0.2 seconds, S _{DS}	0.537 g	0.56 g
Design Spectral Acceleration at 1.0 seconds, S _{D1}	See Note 4	0.37 g

Notes:

- 1) Per ASCE 7-16 Table 1613.5.2
- 2) MCER = Risk-targeted maximum considered earthquake
- 3) g = acceleration of gravity
- 4) Per ASCE 7-16 Supplement 1, Site Class D values for F_v, S_{M1}, and S_{D1} are only valid for calculation of T_s = S_{D1} / S_{DS} for the purpose of developing seismic response coefficients (C_s). Using F_v = 2.04, S_{M1} = 0.57, S_{D1} = 0.38, and T_s = 0.71.
- 5) Per ASCE 7-16 Section 11.4.8, Site Class D sites with S₁ greater than or equal to 0.6g; Site Class E sites with S_s greater than or equal to 1.0g; or Site Class D or E sites with S₁ greater than or equal to 0.2g shall have a site-specific ground motion hazard analysis performed in accordance with Section 21.2 unless exceptions are taken, per Section 11.4.8.
- 6) Per Exception 2 of ASCE 7-16, Section 11.4.8, structures on Site Class D sites with S₁ greater than or equal to 0.2g, a ground motion hazard analysis is not required provided the value of the seismic response coefficient C_s is determined by Eq. (12.8-2) for values of T ≤ 1.5T_s and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for T_L ≥ T > T_s or Eq. (12.8-4) for T > T_L.
- 7) For ASCE 7-22, PGA_M is directly calculated without the need for PGA and F_{PGA}
- 8) Multi-period response spectrum data for ASCE 7-22 eliminates the need for F_a and F_v coefficients.

5.4 INFILTRATION SYSTEMS

The results of on-site field infiltration testing are described in Section 3.3.4 Infiltration. In general, we find that the tested soils have poor infiltration properties, exhibiting unfactored drawdown rates of 0.2 to 0.4 inches/hour. These rates are quite low and are reflective of the moderate fines content of the fills. Additionally, even poorly compacted fill material may have less porosity than a native soil of similar gradation.

We understand that an existing stormwater infiltration system at the western limits of the project was designed and constructed for Coyote Ridge Road. We did not have access to the infiltration design of the system, though based on its location it appears likely that the pond is at least partially located in native soils. These soils may be greater infiltration capacity than the embankment fills.

We recommend that supplemental in situ infiltration testing be performed at locations of proposed stormwater infiltration features as part of design-level geotechnical explorations. Supplemental testing may include additional borehole percolation tests or reduced-scale PIT tests.

5.5 RIGID AND FLEXIBLE PAVEMENTS

Site pavements are expected to include flexible asphalt concrete (AC) sections and rigid Portland cement concrete (PCC) sections. New pavements should be supported by a subgrade prepared in accordance with *Section 5.6 Subgrade Preparation and Evaluation* of this report.

The use of permeable pavements may be feasible, though consideration would need to be given to the potential for lateral seepage to daylight on the existing slopes. Design of permeable pavements, if proposed, should be further evaluated in the future.

Design-level pavement recommendations will depend on expected traffic volumes at the site; however, based on the granular nature of the soils onsite and we anticipate that a 6- to 8-inch aggregate base layer will be suitable for support of both flexible and rigid pavements. This assumes that the upper 12 to 18 inches of soil subgrade consists of new engineered fill or recompacted *in situ* soil. The recommended AC pavement sections will likely be on the order of 2.5 to 3.5 inches thick in parking stalls and drive aisles, respectively. Recommended PCC pavement thicknesses are likely to be approximately 6 inches for reinforced and 5 inches for unreinforced.

Flexible AC should be 0.5-inch hot mix asphalt (HMA) in conformance with the specifications provided in Washington State Department of Transportation (WSDOT) Standard Specifications (WSS) 5 04 – HMA and WSS 9 03.8 – Aggregates for HMA (WSDOT 2022). The AC binder should be PG 64 22 Performance Grade AC according to WSS 9-02.1(4) – Performance Graded Asphalt Binder. The AC should be placed with a minimum lift thickness of 1.5 inches and be compacted to at least 91 percent of Rice Density of the mix, as determined in accordance with American Society for Testing and Materials (ASTM) D 2041.

Rigid PCC pavement should meet the specifications provided in WSS 5 05 – Cement Concrete Pavement. The PCC should have a minimum compressive strength of 4,000 psi and nominal maximum aggregate size of 1.5 inches. The PCC should be constructed with a maximum joint spacing of 15 feet.

Unreinforced slabs should be interlocked at contraction joints (e.g., continuous slab with no dowels), although dowels should be used at construction and expansion joints. Reinforced PCC should have No. 4 bars at 24 inches on center, each way at mid-depth of the PCC.

During site development, construction traffic should be limited to non-building, unpaved portions of the site or haul roads. Construction traffic should not be allowed on new pavements. If construction traffic is to be allowed on newly constructed road sections, an allowance for additional traffic will need to be made in the design pavement section.

5.6 EARTHWORK

Based on available information, we anticipate that earthwork will generally consist of light mass grading and excavation and backfilling for utilities and foundations. We recommend that earthwork activities be

conducted in accordance with the Washington State Department of Transportation (WSDOT) *Standard Specifications* (WSS) (WSDOT 2022).

5.6.1 Subgrade Preparation and Evaluation

Initial site preparation and earthwork operations will include clearing and grubbing, stripping, and grading to establish subgrade elevation for improvements. The surficial layer of soil beneath the vegetation contains roots and other organics and will not be suitable to remain beneath proposed improvements, including buildings and new fills. Actual stripping depths should be based on field observations at the time of construction. Stripped material should be transported off-site for disposal or stockpiled for use in landscaped areas.

We recommend that soil disturbed during grubbing operations be removed to expose firm, undisturbed subgrade. The resulting excavations should be backfilled with compacted structural fill.

The artificial fill soils that blanket the site should be expected to include oversize materials, such as large cobbles, boulders, and potentially oversize construction debris. These oversize materials may require individual handling and their presence may inhibit usage of scrapers for mass grading operations.

5.6.2 Reuse of Existing Site Soils

The on-site near-surface artificial fill materials are expected to be suitable for reuse as structural fill, provided they are stripped of organics including wood debris, properly moisture conditioned, and screened for removal of oversize material, such as cobbles, boulders, and construction debris. The fill materials are anticipated to be generally granular; however, we encountered several layers of silts and clays within the fill, which may be moderately to highly susceptible to wet weather disturbance.

While the *in-situ* soils are typically granular, they have significant fines content and will be moderately susceptible to disturbance from construction activities, particular when wet and/or during the rainy season. Due to the presence of perched water, wet soil conditions may be present even during dry weather. Earthwork planning should include considerations for minimizing subgrade disturbance and employing wet weather/wet soil construction methodologies.

5.6.3 Existing Fill Recomaction

As noted previously, it will be necessary to recompact existing fill materials beneath proposed foundations, slabs, and pavements. Depending upon the proposed usage, composition of the existing fill, moisture content and relative density of the existing fill, and thickness of new fill (if any), the thickness of the recomacted layer will vary, though is generally expected to range from 1 to 3 feet. The soil can be reworked via a combination of removal and replacement, or scarification followed by compaction. If needed, the soil shall be aerated to dry it. Typically, the fill shall be recomacted to a dense and unyielding condition and to a minimum of 90 to 95 percent of the soil's maximum dry density.

5.6.4 Slopes and Setbacks

The proposed site plan includes grading of cut and fill slopes throughout the site, with many proposed buildings situated near the crests of these slopes. Structures placed at the crest of a slope have a greater

potential for experiencing distress related to slope movements unless supported by a foundation system capable of transmitting loads through a potential slide mass.

Current conceptual plans show existing slopes being regraded at a 3H:1V inclination, which based on our analysis is expected to be stable in both static and seismic states. For preliminary planning purposes, we recommend that structures located at least 10 feet from the crest of 3H:1V slopes; however, with building-specific evaluation lessor (to no) setbacks will be feasible.

For planning purposes, we also recommend structures be set-back from a 2H:1V projection extending from the toe of nearby slopes. For structures located between 2H:1V and 3H:1V projection, structure-specific stability analysis will be required.

If slopes are left at inclinations steeper than 3H:1V but flatter than 2H:1V, then they should be considered seismically unstable and susceptible to significant sloughing during a seismic event.

If existing slopes are left at inclinations steeper than 2H:1V then they should be considered both statically and seismically unstable. Structures should not be constructed on or directly adjacent to slopes steeper than 2H:1V.

5.6.5 Excavation and Dewatering

Subsurface conditions within the potential areas of excavation for foundations and subsurface utilities are anticipated to consist of artificial fill primarily composed of loose to medium dense granular soils with occasional layers of fine-grained soils and significant amount of oversized materials (cobbles and boulders). We expect that conventional earthmoving equipment in proper working condition should be capable of making necessary excavations for utilities, footings, and other earthwork. The presence of oversize materials within the artificial fill may reduce the pace of earthwork activities and enlarge trench, footing, and other excavations beyond their planned limits. The soils are generally granular and will have a tendency to run or slough when left in vertical cuts, and the contractor should anticipate that sloughing material could include large cobbles and boulders. Shoring or temporary cut-back slopes will be required for excavation stability.

In general, we anticipate the local groundwater table is within native materials near El. 17. However, higher perched groundwater layers are likely to be present around the site, as observed at many subsurface exploration locations. Excavations through perched water layer are likely to experience seepage and may require the use of localized sump pumps. In some cases, it is possible that sump pumps may not be sufficient for dewatering and the use of well points may be required.

Where permanent cuts will be made into the existing embankment, it is possible that zones of seepage will be encountered that require the installation of permanent passive dewatering system (e.g. French drains, subslab drains, etc.). The need for such systems should be evaluated as design progresses and at the time of construction.

6. Limitations

We have prepared this preliminary report for the exclusive use of Maul Foster Alongi, Inc. and their authorized agents for the proposed Cascade Business Park in North Bonneville, Washington. Our work was completed in general accordance with the Subcontractor Work Order Authorization dated 21 October 2021. Our report is intended to provide our opinion of geotechnical conditions for planning purposes only. Site-specific investigation will be required in order to develop parameters for design and construction of the proposed improvements.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty, express or implied, should be understood.

Any electronic form, facsimile, or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by Haley & Aldrich and will serve as the official document of record.

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FIGURES



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MAP SOURCE: ESRI
SITE COORDINATES: 45°38'29"N, 121°57'55"W

HARTCROWSER
A Division of Haley & Aldrich

CASCADE BUSINESS PARK
NORTH BONNEVILLE, WASHINGTON

VICINITY MAP

APPROXIMATE SCALE: 1 IN = 2000 FT
APRIL 2022

FIGURE 1

GIS: \\haleyaldrich.com\share\proj_data\Notebooks\02030569-000_Cascade_Business_Park\GIS\Maps\2022_04\20230569_000_0002_SITE_PLAN_WITH_EXISTING.mxd - mrschweitzer - 4/20/2022 9:52:24 PM



LEGEND

- BORING
- TEST PIT
- TEST PIT (COLUMBIA WEST ENGINEERING INC., 2012)
- TEST PIT (SQUIER ASSOCIATES, 2001)
- BORING (WOODWARD-CLYDE CONSULTANTS, 1993)
- TEST PIT (WOODWARD-CLYDE CONSULTANTS, 1993)
- MONITORING WELL (WOODWARD-CLYDE CONSULTANTS, 1993)
- BORING (ARMY CORPS OF ENGINEERS, 1990)
- ELEVATION CONTOUR, 1-FOOT INTERVAL
- PROPERTY BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: AUTOCAD FILE "EXISTING TOPOGRAPHY.DWG" MAUL FOSTER ALONGI, 14 APRIL 2022
3. AERIAL IMAGERY SOURCE: CLARITY



0 300 600
SCALE IN FEET



CASCADE BUSNISS PARK
NORTH BONNEVILLE, WASHINGTON

SITE PLAN WITH EXISTING
TOPOGRAPHY

APRIL 2022

FIGURE 2



LEGEND

- | | |
|---|--|
|  | BORING |
|  | TEST PIT |
|  | TEST PIT (COLUMBIA WEST ENGINEERING INC., 2012) |
|  | TEST PIT (SQUIER ASSOCIATES, 2001) |
|  | BORING (WOODWARD-CLYDE CONSULTANTS, 1993) |
|  | TEST PIT (WOODWARD-CLYDE CONSULTANTS, 1993) |
|  | MONITORING WELL (WOODWARD-CLYDE CONSULTANTS, 1993) |
|  | BORING (ARMY CORPS OF ENGINEERS, 1990) |
|  | PROPOSED BUILDING FOOTPRINT |
|  | PROPERTY BOUNDARY |

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: AUTOCAD FILE "SITE PLAN.DWG" MAUL FOSTER ALONGI, 14 APRIL 2022
3. AERIAL IMAGERY SOURCE: CLARITY



CASCADE BUSINESS PARK
NORTH BONNEVILLE, WASHINGTON

SITE PLAN WITH CONCEPTUAL GRADING AND DEVELOPMENT

APRIL 2022

FIGURE 3

APPENDIX A

Field Explorations

Appendix A

FIELD EXPLORATIONS

We evaluated subsurface conditions at the site by completing eight test pits and two borings using the sonic core method between February 9 and 10, 2022. The field explorations were coordinated and overseen by geotechnical staff from Hart Crowser, who classified the various soil units encountered, obtained representative soil samples for geotechnical testing, observed and recorded groundwater conditions, and maintained a detailed log of each test pit and boring. Exploration logs are included in this appendix. Results of the laboratory testing are indicated on the exploration logs and are included in Appendix B.

Figures 2 and 3 of the report show the approximate locations of the explorations. Explorations were located in the field using a hand-held Garmin Global Positioning System (GPS) unit.

Borings

The borings were advanced using sonic boring methods using a track-mounted Terrasonic TSi 150CC drill rig operated by Holt Services, Inc., of Edgewood, Washington. The borings were approximately 6 inches in diameter.

Test Pits

The test pits were excavated by Dan J Fisher Excavating, Inc of Forest Grove, Oregon, using a Case 580N backhoe loader. The test pit dimensions were approximately 10 feet long by 4 feet wide with total depths of approximately 10 to 11 feet.

Soil Sampling and Classification

Materials encountered in the explorations were classified in the field in general accordance with ASTM Standard Practice D 2488 "Standard Practice for the Classification of Soils (Visual-Manual Procedure)."

The exploration logs in this appendix show our interpretation of the exploration, sampling, and testing data. The logs indicate the depths where the soil composition appeared to change; note that the actual changes in soil composition may be gradual. In the field, we classified the samples taken from the explorations according to the methods presented on the Figure A - 1 Key to Exploration Logs. This figure also provides a legend explaining the symbols and abbreviations used in the logs.

Sampling of soils was completed at regular intervals throughout the depth of each boring. The samples were collected with a Standard Penetration Test sampler used in general conformance with ASTM Test Method D 1586 "Standard Method for Penetration Test and Split-Barrel Sampling of Soils." The sampler was driven by a 140-pound auto-trip hammer falling 30 inches, with a hammer energy efficiency of 83 percent. The N value, or number of blows required to drive the sampler 1 foot, or as otherwise indicated into the soils, is shown adjacent to the sample symbols on the boring logs. Disturbed samples were obtained from the sampler and from the sonic cores for subsequent classification and testing.

Sample Description

Identification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. ASTM D 2488 visual-manual identification methods were used as a guide. Where laboratory testing confirmed visual-manual identifications, then ASTM D 2487 was used to classify the soils.

Relative Density/Consistency

Soil density/consistency in borings is related primarily to the standard penetration resistance (N). Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL Relative Density	N (Blows/Foot)	SILT or CLAY Consistency	N (Blows/Foot)
Very loose	0 to 4	Very soft	0 to 1
Loose	5 to 10	Soft	2 to 4
Medium dense	11 to 30	Medium stiff	5 to 8
Dense	31 to 50	Stiff	9 to 15
Very dense	>50	Very stiff	16 to 30
		Hard	>30

Moisture

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

USCS Soil Classification Chart (ASTM D 2487)

Major Divisions			Symbols		Typical Descriptions	
			Graph	USCS		
More than 50% of Material Retained on No. 200 Sieve	Gravel and Gravelly Soils More than 50% of Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (<i><5% fines</i>)		GW	Well-Graded Gravel; Well-Graded Gravel with Sand	
				GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand	
		Gravels (<i>5-12% fines</i>)		GW-GM	Well-Graded Gravel with Silt; Well-Graded Gravel with Silt and Sand	
				GW-GC	Well-Graded Gravel with Clay; Well-Graded Gravel with Clay and Sand	
				GP-GM	Poorly Graded Gravel with Silt; Poorly Graded Gravel with Silt and Sand	
				GP-GC	Poorly Graded Gravel with Clay; Poorly Graded Gravel with Clay and Sand	
		Gravels with Fines (<i>>12% fines</i>)		GM	Silty Gravel; Silty Gravel with Sand	
				GC	Clayey Gravel; Clayey Gravel with Sand	
	Sand and Sandy Soils More than 50% of Coarse Fraction Passing No. 4 Sieve	Sands with few Fines (<i><5% fines</i>)		SW	Well-Graded Sand; Well-Graded Sand with Gravel	
				SP	Poorly Graded Sand; Poorly Graded Sand with Gravel	
		Sands (<i>5-12% fines</i>)		SW-SM	Well-Graded Sand with Silt Well-Graded Sand with Silt and Gravel	
				SW-SC	Well-Graded Sand with Clay; Well-Graded Sand with Clay and Gravel	
				SP-SM	Poorly Graded Sand with Silt; Poorly Graded Sand with Silt and Gravel	
				SP-SC	Poorly Graded Sand with Clay; Poorly Graded Sand with Clay and Gravel	
		Sands with Fines (<i>>12% fines</i>)		SM	Silty Sand; Silty Sand with Gravel	
				SC	Clayey Sand; Clayey Sand with Gravel	
		Fine Grained Soils More than 50% of Material Passing No. 200 Sieve	Silts		ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
					MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
Silty Clay (<i>based on Atterberg Limits</i>)			CL-ML	Silty Clay; Silty Clay with Sand or Gravel; Gravelly or Sandy Silty Clay		
Clays			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay		
			CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay		
Organics			OL/OH	Organic Soil; Organic Soil with Sand or Gravel; Sandy or Gravelly Organic Soil		
Highly Organic (<i>>50% organic material</i>)				PT	Peat - Decomposing Vegetation - Fibrous to Amorphous Texture	

Minor Constituents

Estimated Percentage

Sand, Gravel	
Trace	<5
Few	5 - 15
Cobbles, Boulders	
Trace	<5
Few	5 - 10
Little	15 - 25
Some	30 - 45

Soil Test Symbols

%F	Percent Passing No. 200 Sieve
AL	Atterberg Limits (%)
	Liquid Limit (LL)
	Water Content (WC)
	Plastic Limit (PL)

CA	Chemical Analysis
CAUC	Consolidated Anisotropic Undrained Compression
CAUE	Consolidated Anisotropic Undrained Extension
CBR	California Bearing Ratio
CIDC	Consolidated Drained Isotropic Triaxial Compression
CIUC	Consolidated Isotropic Undrained Compression
CK0DC	Consolidated Drained k0 Triaxial Compression
CK0DSS	Consolidated k0 Undrained Direct Simple Shear
CK0UC	Consolidated k0 Undrained Compression
CK0UE	Consolidated k0 Undrained Extension
CRSCN	Constant Rate of Strain Consolidation
DS	Direct Shear
DSS	Direct Simple Shear
DT	In Situ Density
GS	Grain Size Classification
HYD	Hydrometer
ILCN	Incremental Load Consolidation
K0CN	k0 Consolidation
kc	Constant Head Permeability
kf	Falling Head Permeability
MD	Moisture Density Relationship
OC	Organic Content
OT	Tests by Others
P	Pressuremeter
PID	Photoionization Detector Reading
PP	Pocket Penetrometer
SG	Specific Gravity
TRS	Torsional Ring Shear
TV	Torvane
UC	Unconfined Compression
UUC	Unconsolidated Undrained Triaxial Compression
VS	Vane Shear
WC	Water Content (%)

Groundwater Indicators

▽	Groundwater Level on Date or At Time of Drilling (ATD)
▽	Groundwater Level on Date Measured in Piezometer
○	Groundwater Seepage (Test Pits)

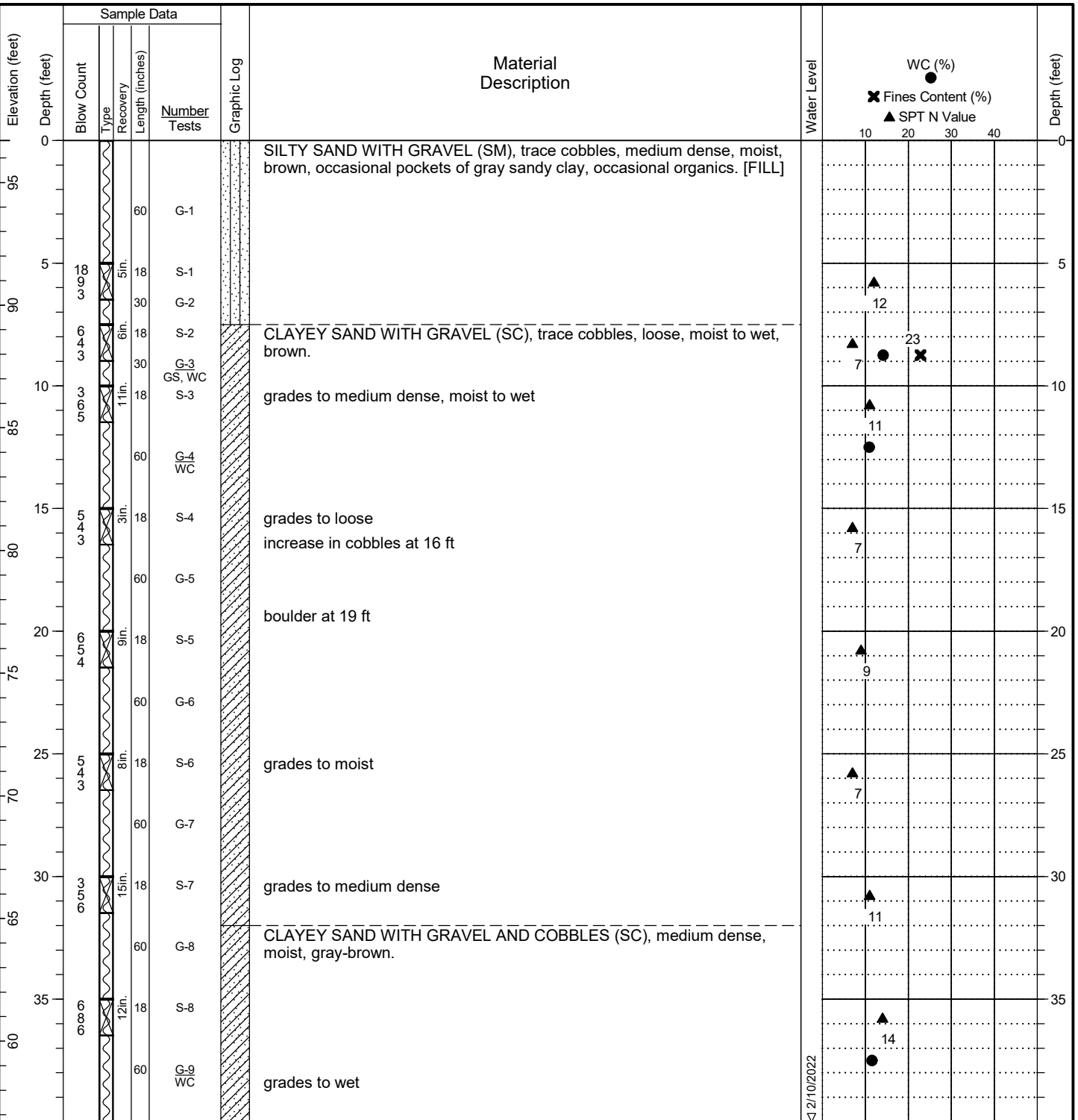
Sample Symbols

☒	1.5" I.D. Split Spoon	■	Rock Core Run	☒	Grab
☒	3.0" I.D. Split Spoon	▨	Sonic Core	▨	Cuttings
☐	Modified California Sampler	▨	Thin-walled Sampler	▨	Push Probe

Well Symbols

Monument		Signal Cable
Surface Seal		
Bentonite Seal		
Well Casing		Vibrating Wire Piezometer (VP)
Sand Pack		
Well Tip or Slotted Screen		
Slough		

Date Started: 02/10/2022	Date Completed: 02/10/2022	Drilling Contractor/Crew: Holt Services, Inc.
Logged by: K. Hendrickson	Checked by: M. Espinoza	Drilling Method: Sonic
Location: Lat: 45.640819 Long: -121.966689 (WGS 84)		Rig Model/Type: TSi 150CC / Track-mounted drill rig
Ground Surface Elevation: 96.71 feet (NAVD 88)		Hammer Type: Auto-hammer
Comments: Groundwater measurement is interpreted as seepage from perched water layer		Hammer Weight (pounds): 140 Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 83
		Hole Diameter: 6 inches Well Casing Diameter: NA
		Total Depth: 51.5 feet Depth to Groundwater: 40.6 feet



General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

Drilling Contractor/Crew: Holt Services, Inc.Drilling Method: SonicRig Model/Type: TSi 150CC / Track-mounted drill rig

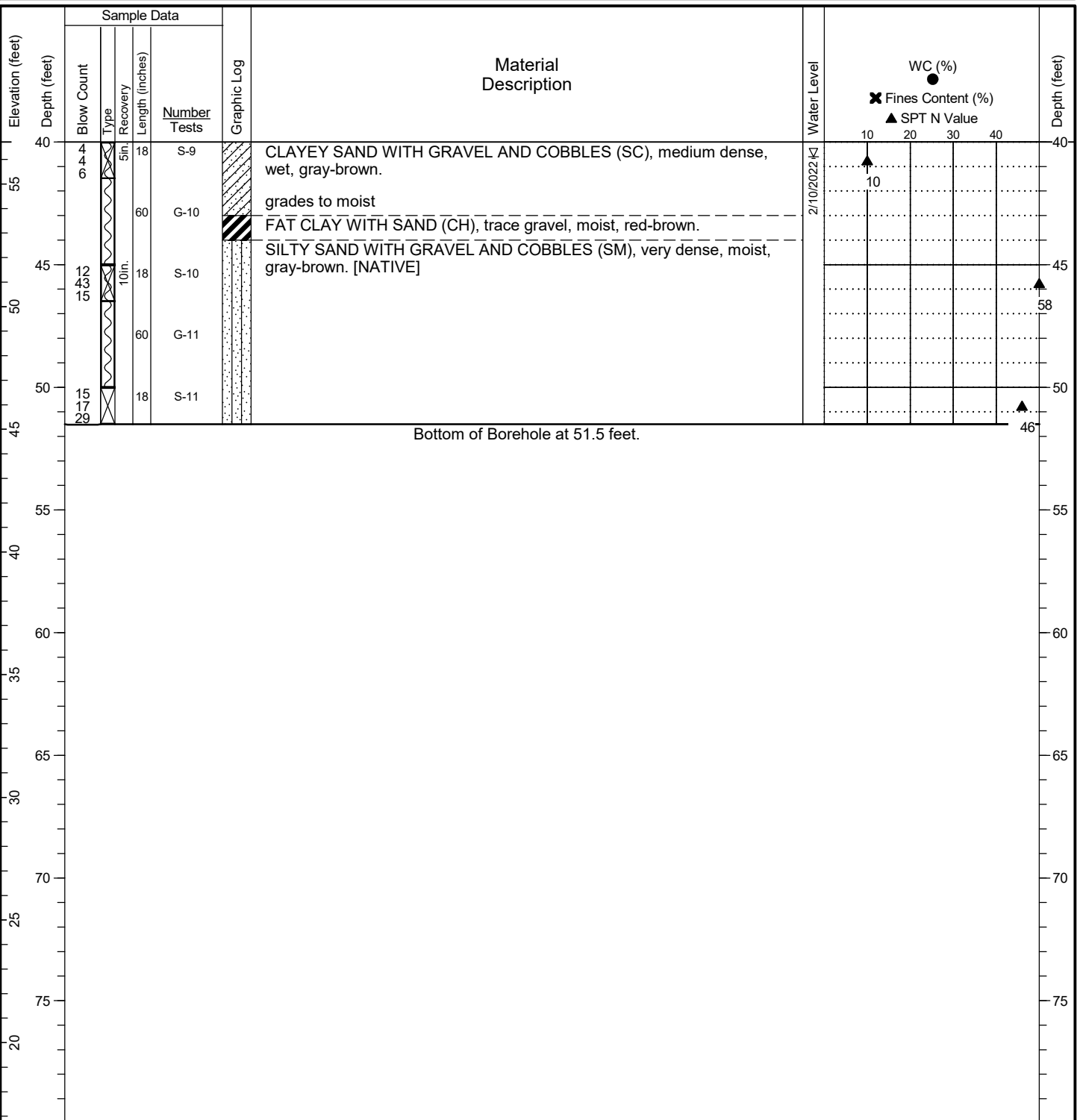
Hammer Type: Auto-hammer

Hammer Weight (pounds): 140 Hammer Drop Height (inches): 30

Measured Hammer Efficiency (%): 83

Well Casing Diameter: NA

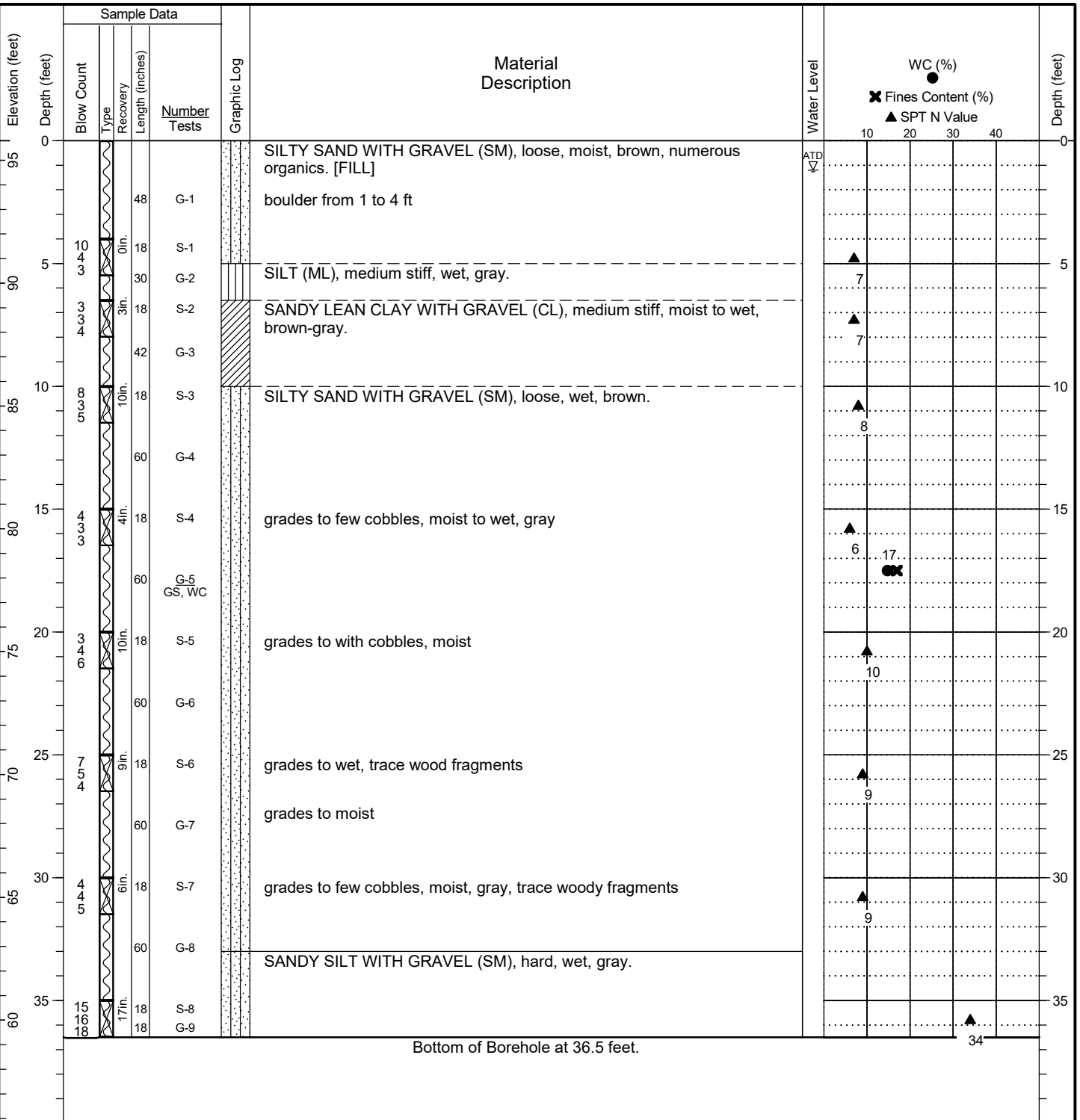
Depth to Groundwater: 40.6 feet



General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

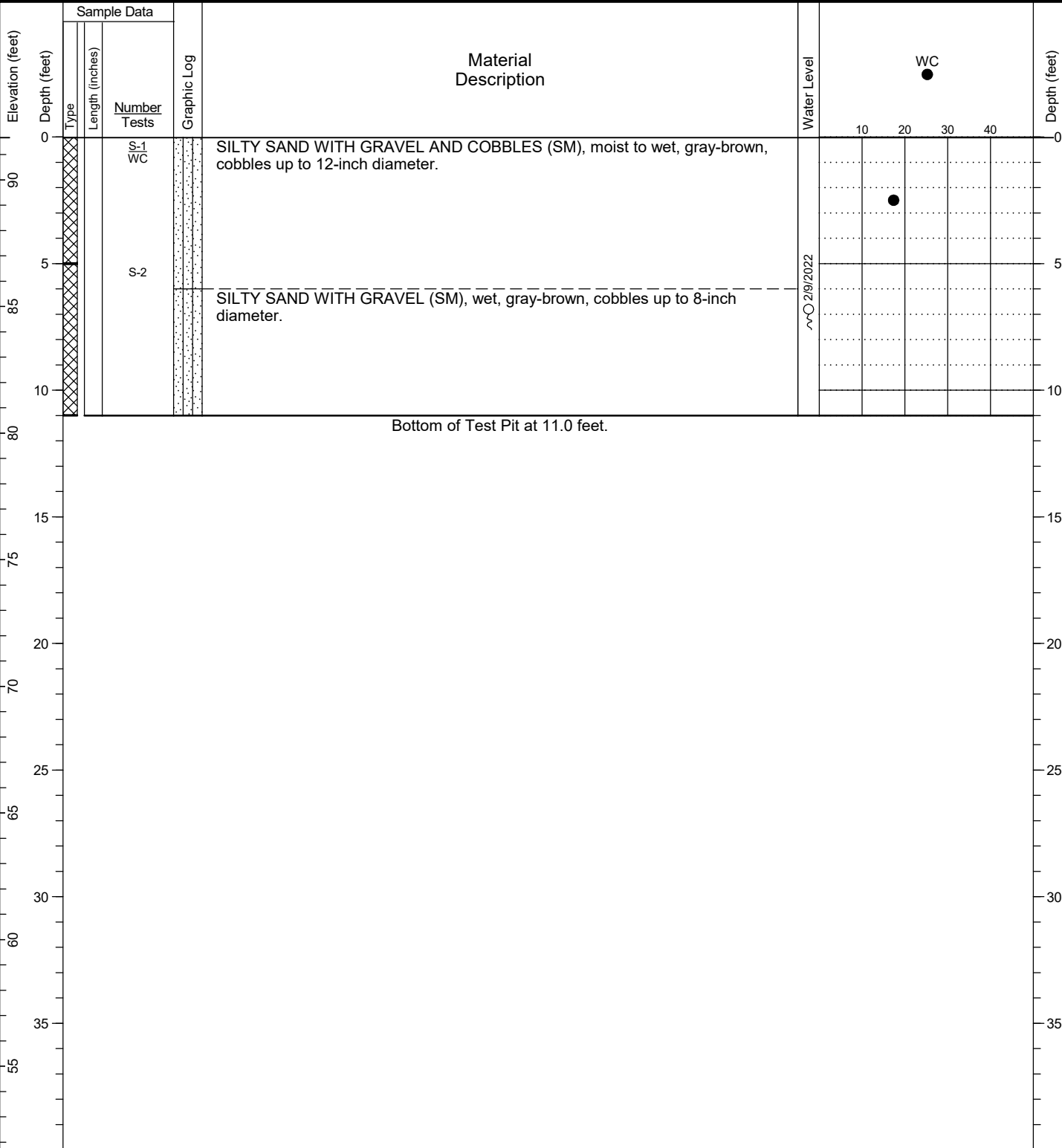
Date Started: 02/10/2022	Date Completed: 02/10/2022	Drilling Contractor/Crew: Holt Services, Inc.
Logged by: K. Hendrickson	Checked by: M. Espinoza	Drilling Method: Sonic
Location: Lat: 45.640543 Long: -121.964884 (WGS 84)		Rig Model/Type: TSi 150CC / Track-mounted drill rig
Ground Surface Elevation: 95.80 feet (NAVD 88)		Hammer Type: Auto-hammer
Comments:		Hammer Weight (pounds): 140 Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 83
		Hole Diameter: 6 inches Well Casing Diameter: NA
		Total Depth: 36.5 feet Depth to Groundwater: 1.2 feet



General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
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4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

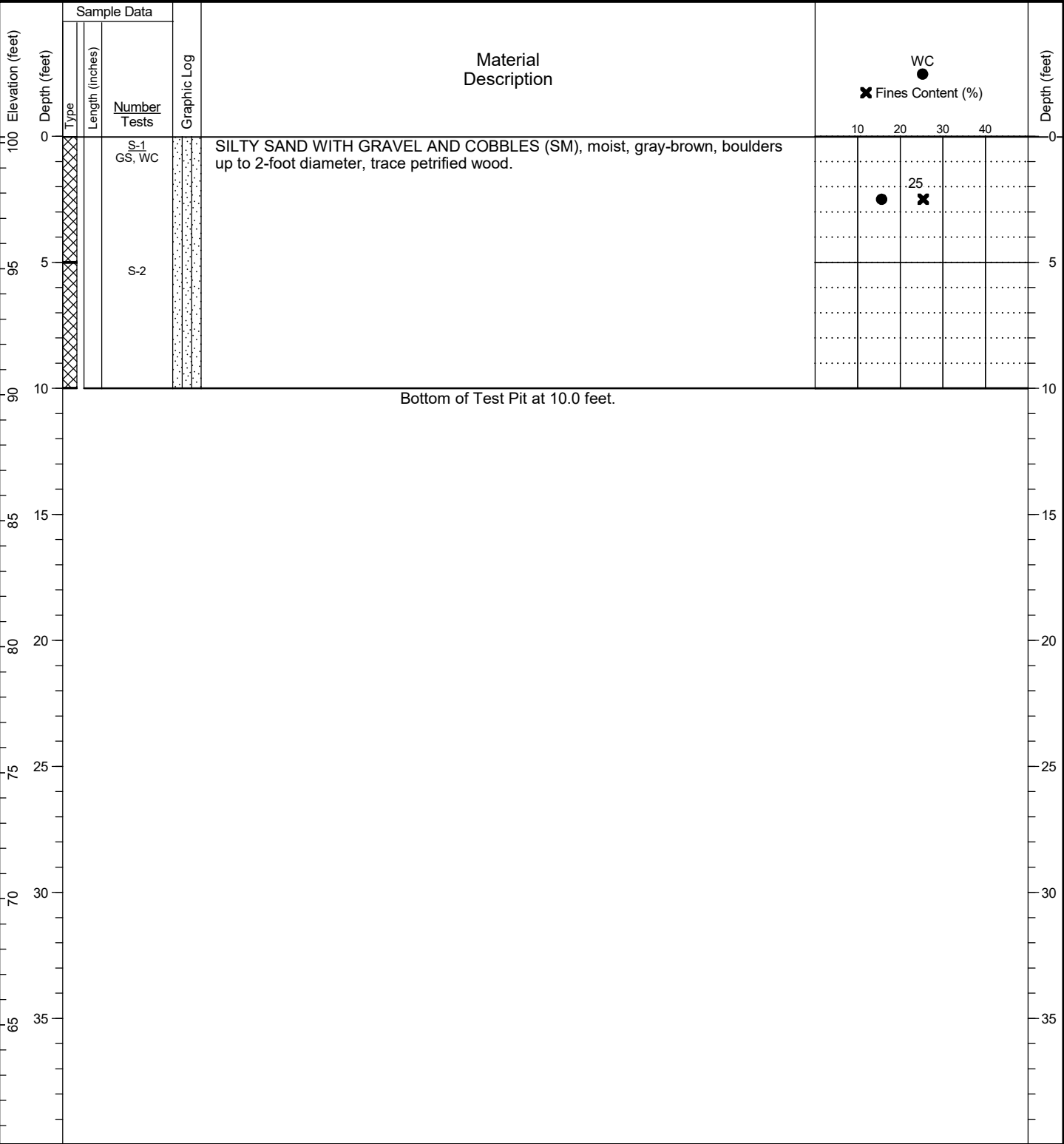
Date Started: 02/09/2022	Date Completed: 02/09/2022	Contractor/Crew: Dan J. Fischer Excavating, Inc.
Logged by: K. Hendrickson	Checked by: M. Espinoza	Rig Model/Type: CASE 580 Super N / Backhoe
Location: Lat: 45.640143 Long: -121.965698 (WGS 84)		Total Depth: 11 feet Depth to Seepage: 7 feet
Ground Surface Elevation: 91.70 feet (NAVD 88)		
Comments:		



- General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
 2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
 3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
 4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
 5. Location and ground surface elevations are approximate.

Date Started: <u>02/09/2022</u>	Date Completed: <u>02/09/2022</u>	Contractor/Crew: <u>Dan J. Fischer Excavating, Inc.</u>
Logged by: <u>K. Hendrickson</u>	Checked by: <u>M. Espinoza</u>	Rig Model/Type: <u>CASE 580 Super N / Backhoe</u>
Location: <u>Lat: 45.640977 Long: -121.965588 (WGS 84)</u>		Total Depth: <u>10 feet</u> Depth to Seepage: <u>Not Encountered</u>
Ground Surface Elevation: <u>100.26 feet (NAVD 88)</u>		
Comments: _____		

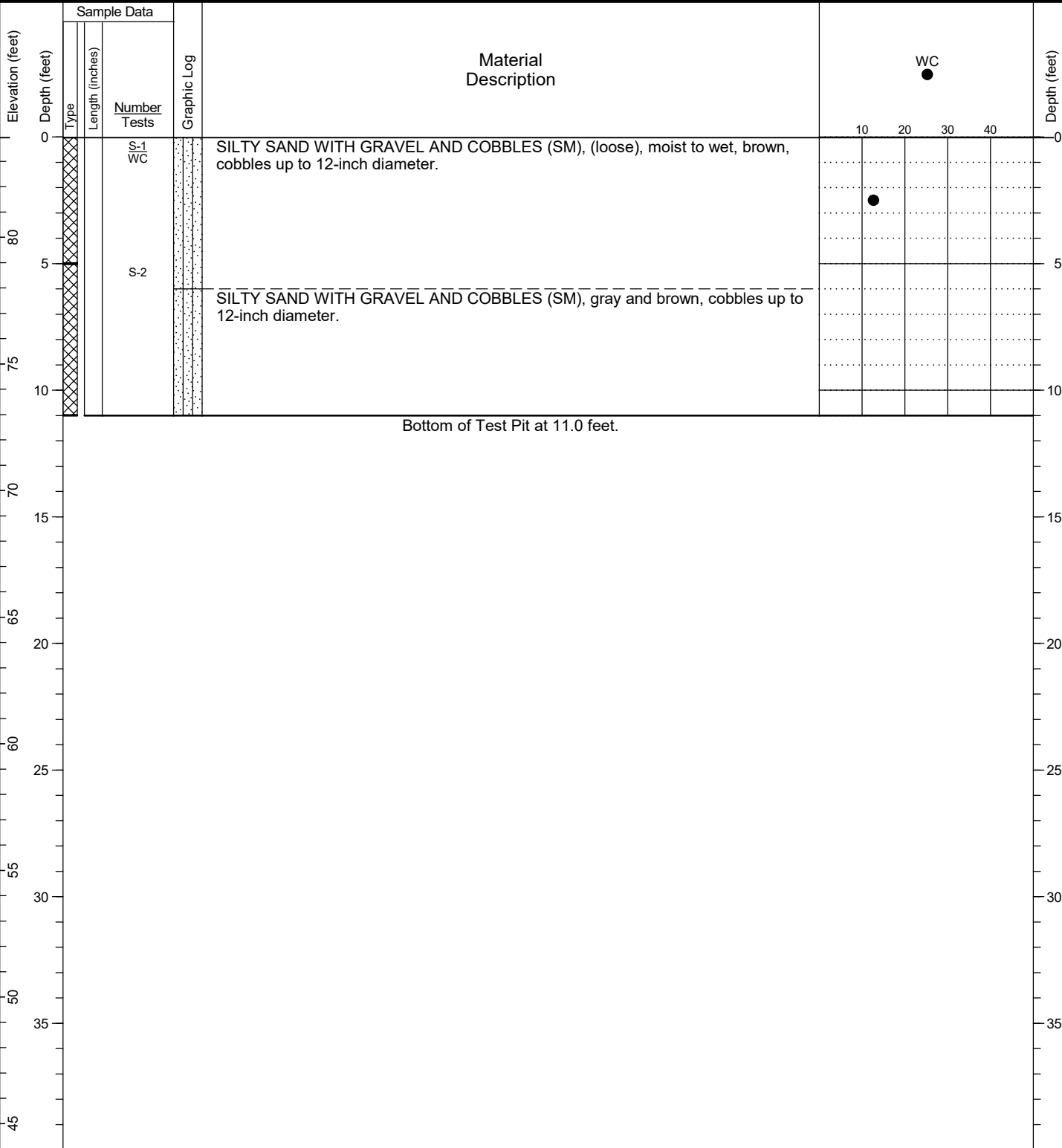
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General Notes:

- Refer to Figure A-1 for explanation of descriptions and symbols.
- Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
- USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
- Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
- Location and ground surface elevations are approximate.

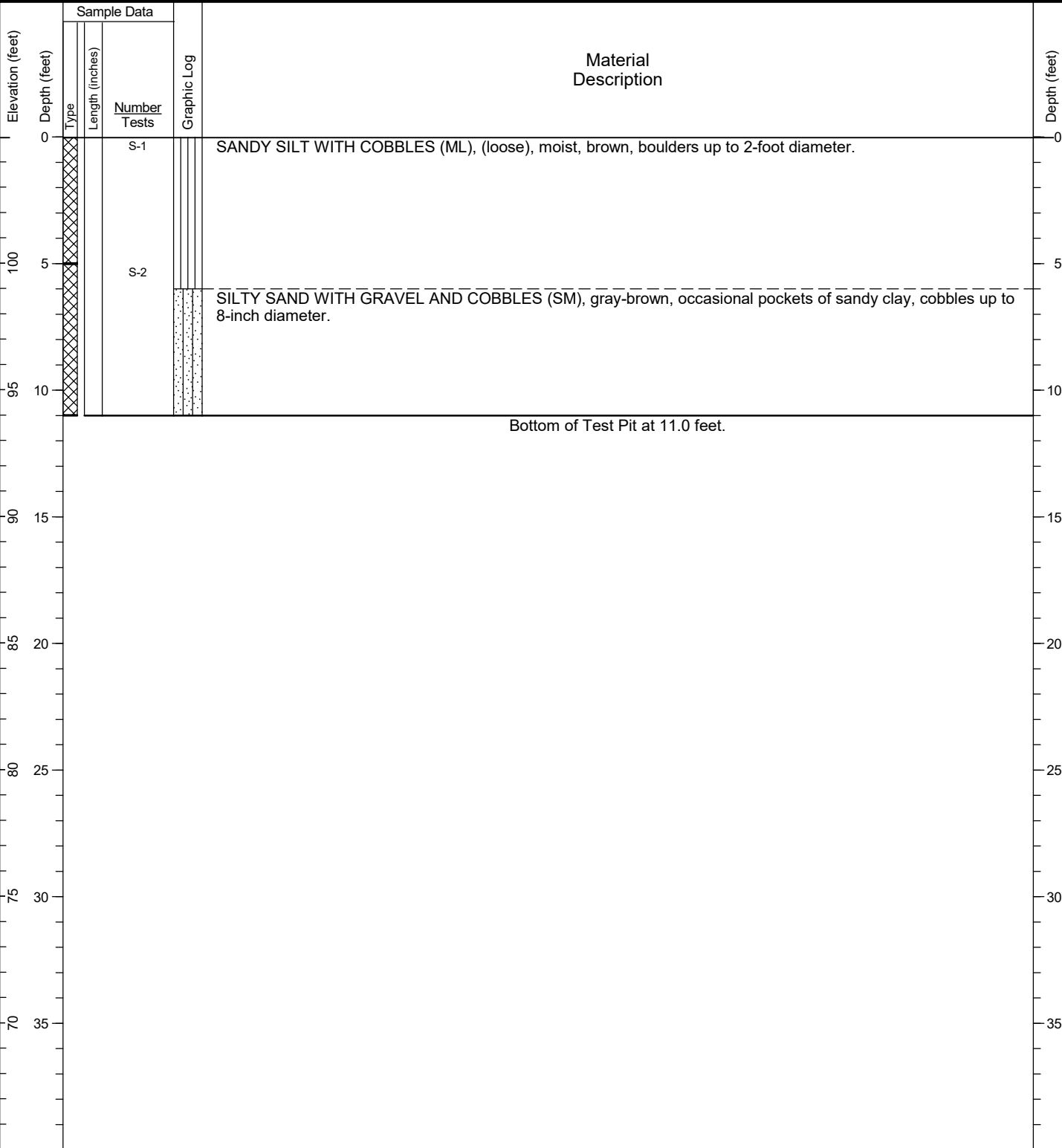
Date Started: 02/09/2022	Date Completed: 02/09/2022	Contractor/Crew: Dan J. Fischer Excavating, Inc.
Logged by: K. Hendrickson	Checked by: M. Espinoza	Rig Model/Type: CASE 580 Super N / Backhoe
Location: Lat: 45.641834 Long: -121.965550 (WGS 84)	Total Depth: 11 feet	Depth to Seepage: Not Encountered
Ground Surface Elevation: 83.96 feet (NAVD 88)		
Comments: Standing water at surface		



General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
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4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

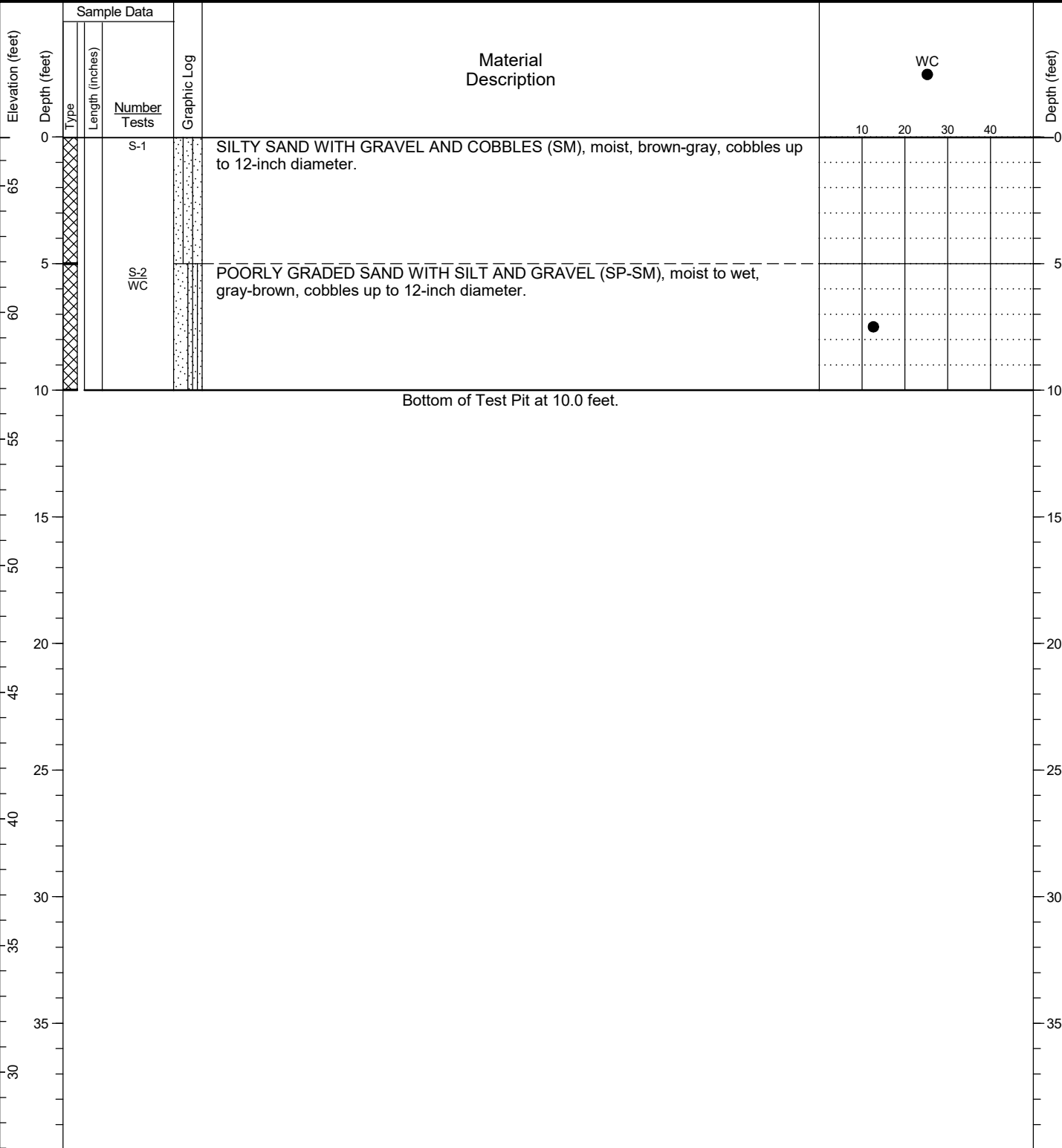
Date Started: 02/09/2022	Date Completed: 02/09/2022	Contractor/Crew: Dan J. Fischer Excavating, Inc.
Logged by: K. Hendrickson	Checked by: M. Espinoza	Rig Model/Type: CASE 580 Super N / Backhoe
Location: Lat: 45.641503 Long: -121.964406 (WGS 84)	Total Depth: 11 feet	Depth to Seepage: Not Encountered
Ground Surface Elevation: 104.98 feet (NAVD 88)	Comments:	



General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

Date Started: 02/09/2022	Date Completed: 02/09/2022	Contractor/Crew: Dan J. Fischer Excavating, Inc.
Logged by: K. Hendrickson	Checked by: M. Espinoza	Rig Model/Type: CASE 580 Super N / Backhoe
Location: Lat: 45.642505 Long: -121.962879 (WGS 84)	Total Depth: 10 feet	Depth to Seepage: Not Encountered
Ground Surface Elevation: 66.93 feet (NAVD 88)		
Comments:		

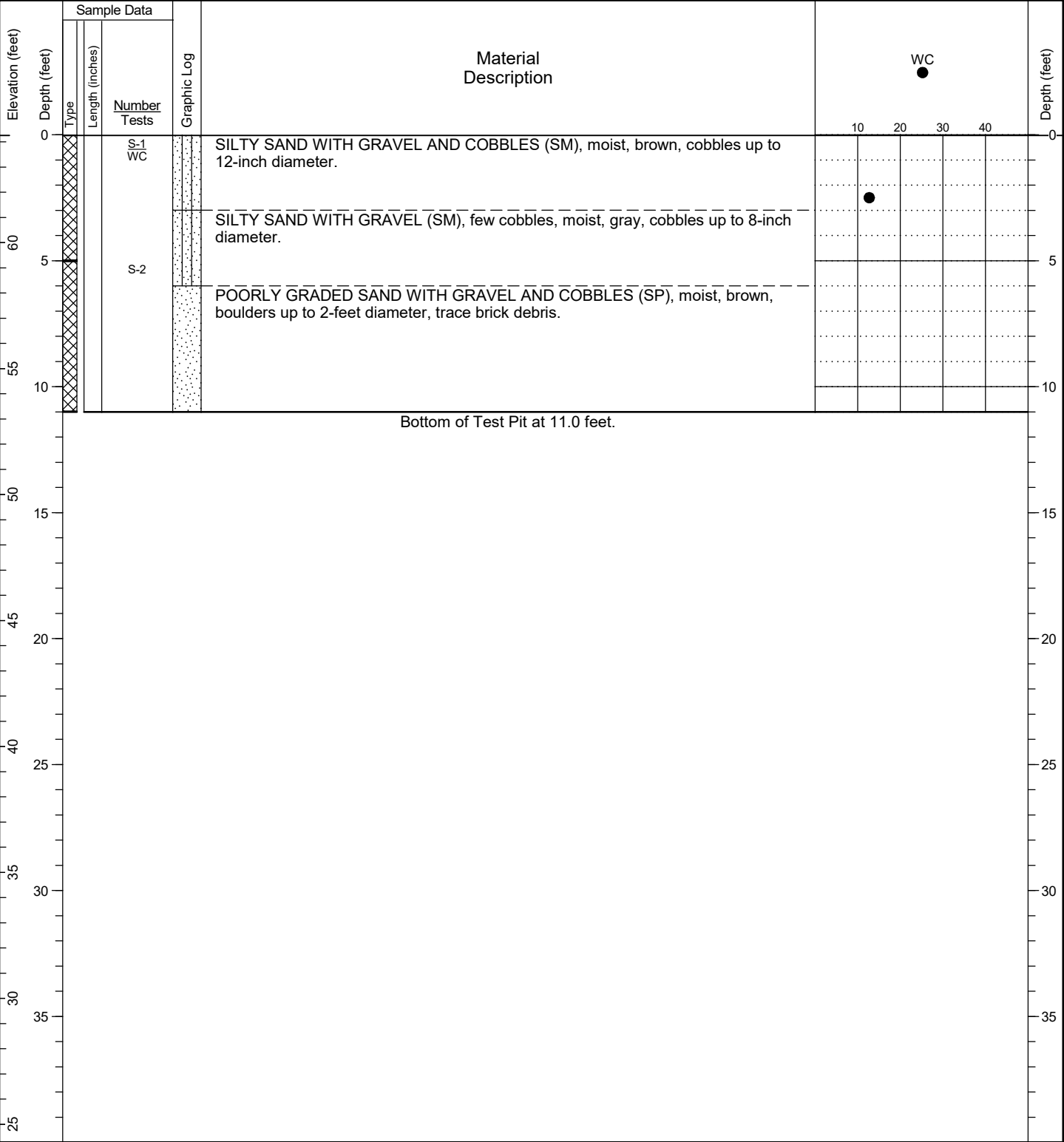


General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

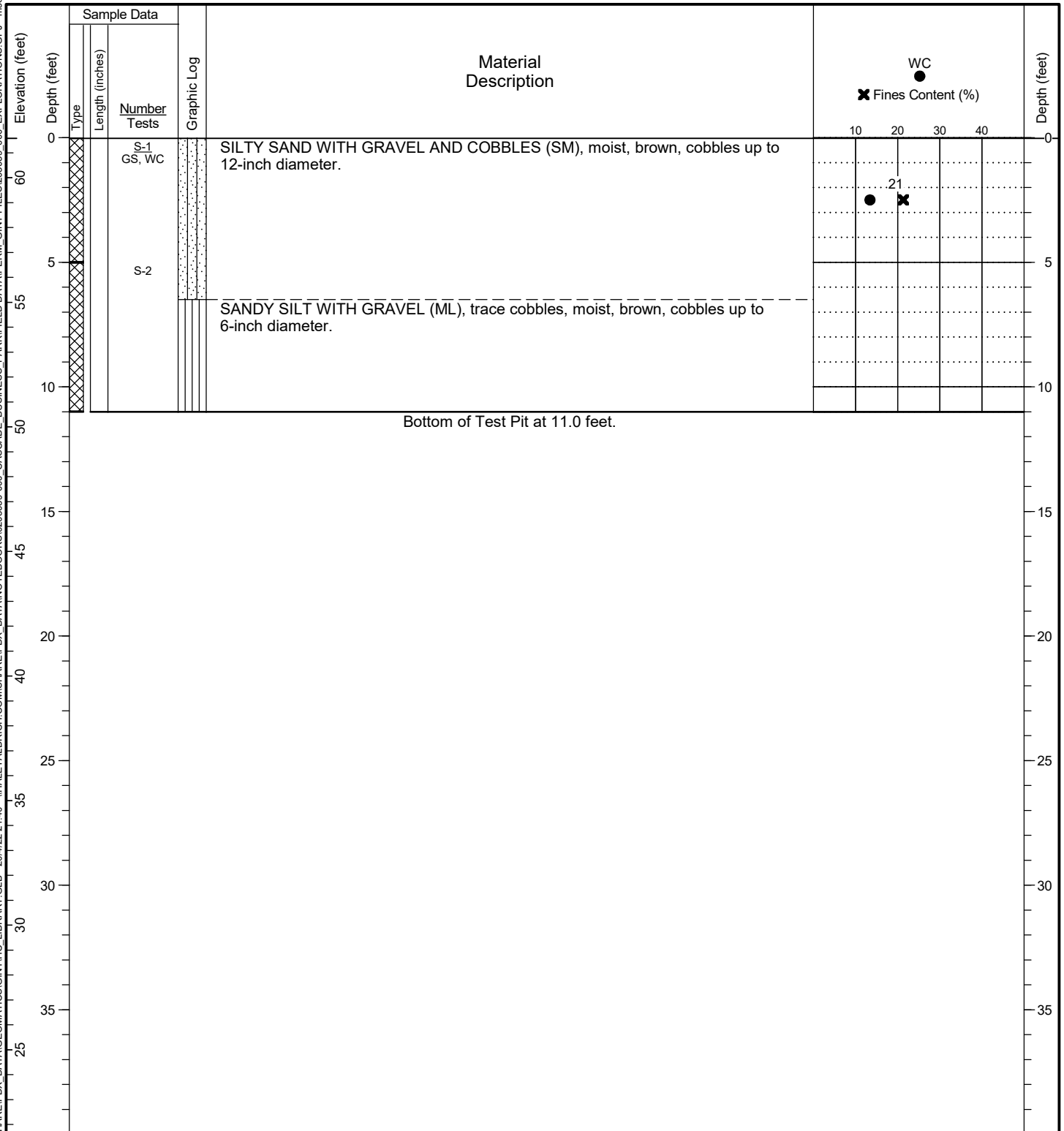
Date Started: <u>02/09/2022</u>	Date Completed: <u>02/09/2022</u>	Contractor/Crew: <u>Dan J. Fischer Excavating, Inc.</u>
Logged by: <u>K. Hendrickson</u>	Checked by: <u>M. Espinoza</u>	Rig Model/Type: <u>CASE 580 Super N / Backhoe</u>
Location: <u>Lat: 45.643415 Long: -121.962079 (WGS 84)</u>		Total Depth: <u>11 feet</u> Depth to Seepage: <u>Not Encountered</u>
Ground Surface Elevation: <u>64.29 feet (NAVD 88)</u>		
Comments: _____		

HC TEST PIT - \\HALEYALDRICH\COM\SHARE\PD\X_DATA\GEOMATICS\GINT\HC_LIBRARY\GLB - 20\4\22 21:40 - \\HALEYALDRICH\COM\SHARE\PD\X_DATA\NOTES\BOOKS\0203059-000_CASCADE_BUSINESS_PARK\FIELD DATA\PERM_GINT FILES\03059-000_EXPLORATIONS.GPJ - mschweitzer



- General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
 2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
 3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
 4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
 5. Location and ground surface elevations are approximate.

Date Started: 02/09/2022	Date Completed: 02/09/2022	Contractor/Crew: Dan J. Fischer Excavating, Inc.
Logged by: K. Hendrickson	Checked by: M. Espinoza	Rig Model/Type: CASE 580 Super N / Backhoe
Location: Lat: 45.643742 Long: -121.961089 (WGS 84)	Total Depth: 11 feet	Depth to Seepage: Not Encountered
Ground Surface Elevation: 61.61 feet (NAVD 88)		
Comments:		



General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

APPENDIX B

Laboratory Test Results

Appendix B

LABORATORY TEST RESULTS

General

Soil samples obtained from the explorations were transported to our laboratory and evaluated to confirm or modify field classifications, as well as to assess engineering properties of the soils encountered. Representative samples were selected for laboratory testing. The tests were performed in general accordance with the test methods of the ASTM or other applicable procedures. A summary of the test results is included as Figure B-1.

Visual Classifications

Soil samples obtained from the explorations were visually classified in the field and in our geotechnical laboratory based on the Unified Soil Classification System and ASTM classification methods. ASTM Test Method D 2488 was used to classify soils using visual and manual methods. ASTM Test Method D 2487 was used to classify soils based on laboratory test results.

Laboratory Test Results

Moisture Content

Moisture contents of samples were obtained in general accordance with ASTM Test Method D 2216. The results of the moisture content tests completed on samples from the explorations are presented on the exploration logs included in Appendix A and on Figure B-1 in this appendix.

Percent Fines

Fines content analyses were performed to determine the percentage of soils finer than the No. 200 sieve—the boundary between sand size particles and silt size particles. The tests were performed in general accordance with ASTM Test Method D 1140. The test results are indicated on the exploration logs included in Appendix A and on Figure B-1 in this appendix.

Particle Size Distribution

Sieve analysis tests were also performed to determine the quantitative distribution of particle sizes in the sample. The tests were performed in general accordance with ASTM Test Method D 6913. The “percent fines” portions of the test results are indicated on the appropriate exploration logs included in Appendix A and on Figure B-1 in this appendix. The full test results are shown on Figure B-2 in this appendix.

SEATTLE - HC LAB SUMMARY (FOR REPORTS) - \\HALEYALDRICH.COM\SHARE\SEA_DATA\GINT\HC LIBRARY GLB - 3/8/22 10:49 - \\HALEYALDRICH.COM\SHARE\IPDX_DATA\NOTEBOOKS\0203059-000_CASCADE_BUSINESS_PARK\FIELD DATA\PERM_GINT FILES\03059_000_EXPLORATIONS.GPJ - anuiz

Exploration	Sample ID	Depth	Gravel (%)	Sand (%)	Fines (%)	Liquid Limit	Plastic Limit	Water Content (%)	USCS Group Symbol	Soil Description
B-06	G-1	0.0								
B-06	G-2	5.0								
B-06	S-1	5.0								
B-06	G-3	7.5	37.1	40.0	22.8			14.1	SM	SILTY SAND WITH GRAVEL
B-06	S-2	7.5								
B-06	G-4	10.0						10.9		
B-06	S-3	10.0								
B-06	G-5	15.0								
B-06	S-4	15.0								
B-06	G-6	20.0								
B-06	S-5	20.0								
B-06	G-7	25.0								
B-06	S-6	25.0								
B-06	G-8	30.0								
B-06	S-7	30.0								
B-06	G-9	35.0						11.5		
B-06	S-8	35.0								
B-06	G-10	40.0								
B-06	S-9	40.0								
B-06	G-11	45.0								
B-06	S-10	45.0								
B-06	S-11	50.0								
B-07	G-1	0.0								
B-07	G-2	4.0								
B-07	S-1	4.0								
B-07	G-3	6.5								
B-07	S-2	6.5								
B-07	G-4	10.0								
B-07	S-3	10.0								
B-07	G-5	15.0	41.2	41.9	17.0			14.8	SM	SILTY SAND WITH GRAVEL
B-07	S-4	15.0								
B-07	G-6	20.0								
B-07	S-5	20.0								
B-07	G-7	25.0								
B-07	S-6	25.0								
B-07	G-8	30.0								
B-07	S-7	30.0								
B-07	G-9	35.0								
B-07	S-8	35.0								
TP-01	S-1	0.0						17.4		
TP-01	S-2	5.0								
TP-02	S-1	0.0	39.1	35.5	25.4			15.6	GM	SILTY GRAVEL WITH SAND
TP-02	S-2	5.0								
TP-03	S-1	0.0						12.7		
TP-03	S-2	5.0								
TP-04	S-1	0.0								
TP-04	S-2	5.0								



Project: Cascade Business Park
 Location: North Bonneville, Washington
 Project No.: 0203-059-000

Summary of Laboratory Results

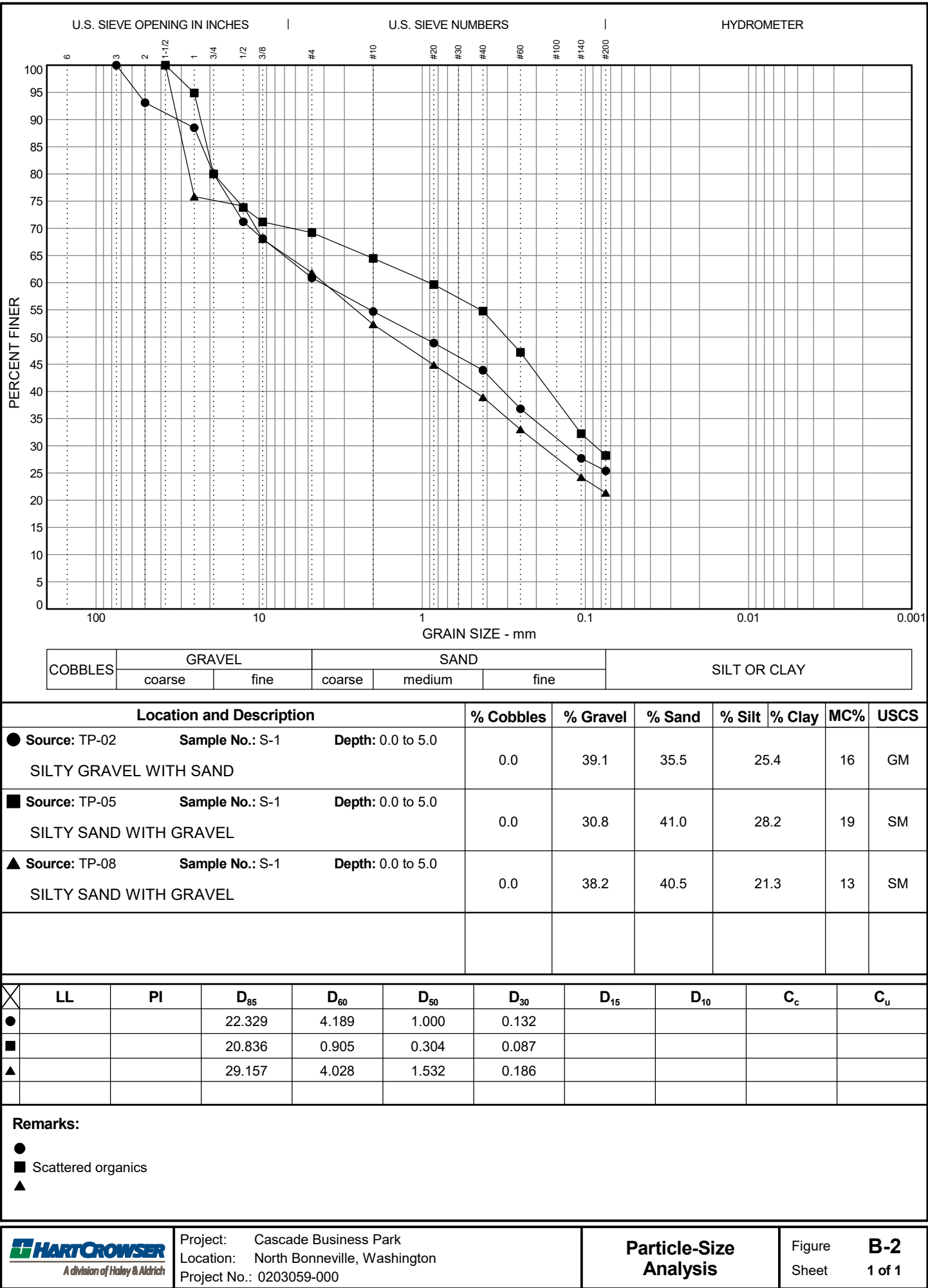
Figure Sheet **B-1**
 1 of 2

SEATTLE - HC LAB SUMMARY (FOR REPORTS) - \\HALEYALDRICH.COM\SHARE\SEA_DATA\GINTHC_LIBRARY\GLB - 3/8/22 10:49 - \\HALEYALDRICH.COM\SHARE\IPDX_DATA\NOTEBOOKS\0203059-000_CASCADE_BUSINESS_PARK\FIELD DATA\PERM_GINT FILES\203059_000_EXPLORATIONS.GPJ - aniliz

Exploration	Sample ID	Depth	Gravel (%)	Sand (%)	Fines (%)	Liquid Limit	Plastic Limit	Water Content (%)	USCS Group Symbol	Soil Description
TP-05	S-1	0.0	30.8	41.0	28.2			19.4	SM	SILTY SAND WITH GRAVEL
TP-05	S-2	5.0								
TP-06	S-1	0.0								
TP-06	S-2	5.0						12.6		
TP-07	S-1	0.0						12.7		
TP-07	S-2	5.0								
TP-08	S-1	0.0	38.2	40.5	21.3			13.4	SM	SILTY SAND WITH GRAVEL
TP-08	S-2	5.0								

--

HC GRAIN SIZE - \HALEYALDRICH.COM\SHARE\SEA_DATA\GINT\HC_LIBRARY\GLB - 3/8/22 10:48 - \HALEYALDRICH.COM\SHARE\PD\DATA\NOTEBOOKS\0203059-000_CASCADE_BUSINESS_PARK\FIELD DATA\PERM_GINT FILES\203059_000_EXPLORATIONS.GPJ - ahultz



APPENDIX C

Historical Exploration Logs

HOLE NUMBER: 12		FEATURE: HAMILTON ISLAND		
TOP ELEVATION: 103.07' MSL		COORDINATES: N: 723489 E: 1825782		
TOTAL DEPTH: 46'		INCLINATION FROM HORIZ: 90°		
DEPTH	U.S.C. CLASS	DESCRIPTION	DRAWINGS	REMARKS
0	OM	FILL-GRAVEL 40%, SUB-ANGULAR TO ROUNDED FRESH, ALL SIZES UP TO BOULDERS. 60% BASALT (RIVER GRAVEL BUT NOT IN PLACE) MATRIX-PLASTIC SANDY SILT.	DRILL HOLE BACK FILLED WITH GROUT	HOLE DRILLED WITH 8" AUGER
5		MATERIAL CHANGES BETWEEN 6' AND 10' FROM RIVER GRAVELS TO PREDOMINATELY MATERIAL OF WEIGLE ORIGIN.		STOPPED BY BOULDER AT 4'. MOVED 2' EAST AND CONTINUED HOLE SPT #1 4.5'-5.3' 5/28/REFUSAL
10	FILL CONTINUED- GRAVEL-ROCK FRAGMENTS COMPOSED MOSTLY OF WEIGLE. BOULDER AT 11'	SPT #2 9.5'-11.0' 4/8/14 BLOWS		
15		SPT #3 14.5'-16.0' 4/12/14 BLOWS		
20		SPT #4 19.5'-21.0' 7/13/12 BLOWS		
25		SPT #5 24.5'-26.0' 3/8/9 BLOWS		
30	MATERIAL CHANGES BETWEEN 26' TO 29' TO FRESH ANGULAR BASALTIC ROCK FRAGMENTS	SPT #6 29.5'-31.0' 3/12/18 BLOWS		
35	LARGE WEIGLE BOULDER AT 32'	AUGER REFUSED TO PENETRATE BELOW 32'. PULLED AUGERS AND REPLACED BLADES NO WATER AT 32'		
40	DECOMPOSED WEIGLE	SPT #7 34.5'-38.0' 18/11/13 BLOWS		
45	FRESH TCR BASALT IN MOIST PLASTIC SILT MATRIX	SPT #8 39.5'-41.0' 8/12/19 BLOWS		
50	GRAVELLY SILT-MOIST, PLASTIC, NON-DILATANT, MICACEOUS. GRAVEL 15%, FRESH ANGULAR TCR	SPT #9 44.5'-46.0' 3/12/14 BLOWS		
	HOLE BOTTOMED 4 AUG 89	SAMPLE # 89080701 SS TAKE WITH SPT #8		
		HOLE GROUTED SHUT ON 7 AUG.		

HAMILTON ISLAND

HOLE NUMBER: 14		FEATURE: HAMILTON ISLAND		
TOP ELEVATION: 59.35' MSL		COORDINATES: N: 723928.81		E: 1828383.94
TOTAL DEPTH: 19.6'		INCLINATION FROM HORIZ: 90°		
DEPTH	U.S.C CLASS	DESCRIPTION	DRAWINGS	REMARKS
0	GM	FILL-GRAVEL WITH WOOD, PLASTIC AND SOME METAL. THE PLASTIC IS IN THE FORM OF HEAVY DUTY PLASTIC WRAP. THE WOOD IS CRUSHED AND BROKEN LUMBER AND BEAMS. METAL IS IN THE FORM OF NAILS AND SPIKES. GRAVELS 50% OF MATERIAL-ANGULAR TO SUB-ROUNDED RIVER GRAVELS. ALL SIZES UP TO BOULDERS. 95% BASALTS-FRESH	HOLE BACK FILLED WITH GROUT	STARTED AUGERING 2 AUGUST 89
5				SPT #1 4.5'-8.8' 2/2/3 BLOWS
10	ML	SILT-PLASTIC, WET-PROBABLY THE ORIGINAL FLOOD-PLAIN SURFACE		SPT #2 9.5'-11.8' 14/25/18 BLOWS
15	GM	GRAVEL-DIPLACE-VERY HARD TO AUGER THROUGH RIVER GRAVEL, MULTILITHIC, FRESH, SUBANGULAR TO ROUNDED QUARTIZES PRESENT. MOSTLY BASALT		FIRST HOLE ABANDONED DUE TO BOULDER SECOND HOLE AUGERED TO 4'. THIRD HOLE AUGERED TO 20' BEFORE REFUSAL
20		NO WATER AT BOTTOM		SPT #3 14.5'-16.8' 2/9/12 BLOWS
25		HOLE BOTTOMED 2 AUG 1989		SPT #4 19.5-19.8 REFUSAL-28 BLOWS
30				HOLE GROUTED SHUT ON 9 AUG 89 AUGER CUTTINGS WERE STORED IN DRUM
35				
40				
45				
50				

HAMILTON ISLAND

PROJECT: PARCELS 2 AND C		93C0036	LOG OF BORING NO: MW1	
DATE STARTED: 1/25/93 COMPLETED: 1/25/93		TOTAL DEPTH: FT.	SURFACE ELEV: 58.87 FT.	DEPTH TO GW: FT.
LOGGED BY: T. BOOTH		PIEZOMETER SCREENED INTERVAL BGS: SEE REDRILL TO FT.		
DRILLING METHOD: HOLLOW STEM AUGER		INCLINOMETER: N/A		
DRILLING EQUIPMENT: TRAILER RIG		LOCATION: MAINTENANCE AREA #2		
DRILLING AGENCY: GEO-TECH		TOTAL NUMBER OF SAMPLES: 1 LAB SAMPLE		

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent 10 20 30 40 50	VISUAL DESCRIPTION (USCS)	REMARKS
			12			Dark gray silty SAND with little gravel, trace clay (SM)	
			18				
			25				
				10			
				19			
				16			
			7			Brown	-Lab sample
		NR	10				
			8				
				5			
				7			
				7			
			16			Coarse gravelly, mottled	
		NR	18				
			22			Very rocky	-Refusal on drilling
			10				

BORING TERMINATED AT 11'
REDRILLED - SEE MW-1(REDRILL) LOG



PROJECT: PARCELS 2 AND C		93C0036		LOG OF BORING NO: MW1 REDRILL	
DATE STARTED: 1/27/93 COMPLETED: 1/28/93		TOTAL DEPTH: 49 FT.		SURFACE ELEV: 60.09 FT. DEPTH TO GW: 4.5 FT.	
LOGGED BY: T. BOOTH		PIEZOMETER SCREENED INTERVAL BGS: 49 TO 36 FT.			
DRILLING METHOD: AIR ROTARY		INCLINOMETER: N/A			
DRILLING EQUIPMENT: SCHRAMM		LOCATION: NEAR FORMER MAINTENANCE AREA #2, PARCEL 2			
DRILLING AGENCY: GEO-TECH		TOTAL NUMBER OF SAMPLES: 1			

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent 10 20 30 40 50	VISUAL DESCRIPTION (USCS)	REMARKS	Well Construction
			5			0-11' see boring log MW1 (SM)		
			10					
			15			Sand, gravel, cobbles, boulders (GW/GP)	Cannot sample due to rock (Drilled through large rock)	
			20			Dark gray, angular gravel, clean, dry - Rock	- Possibly no recovery of fines	
			25			Silty fine to coarse SAND with little to some gravel, medium brown, moist (SM) - More gravel, possible cobble, boulder	Softer material Description from cuttings	
			30			Silty, fine sand		
			35					



PROJECT: PARCELS 2 AND C

93C0036

LOG OF BORING NO: MW1
REDRILL

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent 10 20 30 40 50	VISUAL DESCRIPTION (USCS)	REMARKS	Well Construction
			35			Gray brown sandy fine GRAVEL with some silt (GM)		
			40			Silty SAND with little gravel, brown, gray (SM)		
			45			Sandy fine GRAVEL with some silt, gray brown (GM) Sand becomes coarser, little to trace silt	2/25/93 (After 1/2 hour) 1st gw (approx)	

BORING TERMINATED AT 49'

(Drillers notes: After drilling through boulders at D=20' becomes easier drilling and sand and gravel for rest of hole)



PROJECT: PARCELS 2 AND C				93C0036		LOG OF BORING NO: MW2	
DATE STARTED: 1/29/93 COMPLETED: 1/30/93				TOTAL DEPTH: 26.6 FT.		SURFACE ELEV: 65.52 FT. DEPTH TO GW: 10.5 FT.	
LOGGED BY: T. BOOTH				PIEZOMETER SCREENED INTERVAL BGS: 16 TO 5 FT.			
DRILLING METHOD: AIR ROTARY				INCLINOMETER: N/A			
DRILLING EQUIPMENT: SCHRAMM				LOCATION: MAINTENANCE AREA #1			
DRILLING AGENCY: GEO-TECH				TOTAL NUMBER OF SAMPLES: 5, 1 LAB SAMPLE			

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent	10	20	30	40	50	VISUAL DESCRIPTION (USCS)	REMARKS	Well Construction
	NR		7 26 32								Silty fine to coarse SAND with gravel, brown, wet (SM) (FILL)	- Approx. W	
	NR		19 50/6								Trace gravel, wet	Ponded water throughout swale (Water perched on natural soil)	
	30		11 24 17										
	30		24 27 40								Silty SAND and GRAVEL, wet	2/25/93 Lab Sample Fill	
	25		8 24 11								- Rock	Natural	
			7 14 25								Sandy SILT with gravel, gray, damp, (ML)	Sample mostly gravel, angular took baggie sample for TLC	
	65										Clayey SILT with trace sand, gravel, dark gray, moist		
	30		20 26 38								Sandy fine to coarse GRAVEL, angular, with trace to little silt, dark gray, moist (GP/GW)	No sample saved, too much gravel	

BORING TERMINATED AT 26.5'

Woodward-Clyde Consultants	SAMPLE KEY: Standard Penetration Test Dames and Moore	PAGE 1 OF 1
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PROJECT: PARCELS 2 AND C

93C0036

LOG OF BORING NO: MW3

DATE STARTED: 2/23/93 COMPLETED: 3/2/93

TOTAL DEPTH:

FT.

SURFACE ELEV 1.34 FT.

DEPTH TO GW: FT.

LOGGED BY: T. BOOTH

PIEZOMETER SCREENED INTERVAL BGS:

27

TO

15.5 FT.

DRILLING METHOD: AIR ROTARY

INCLINOMETER: N/A

DRILLING EQUIPMENT: NODWELL

LOCATION: APPARENT DEBRIS DISPOSAL SITE, PARCEL 2

DRILLING AGENCY: SOIL SAMPLING SERVICE

TOTAL NUMBER OF SAMPLES: 1, NO LAB SAMPLES

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent 10 20 30 40 50	VISUAL DESCRIPTION (USCS)	REMARKS	Well	Construction
						Silty fine SAND and fine to coarse GRAVEL medium brown, wet (SM) (FILL) 3/3/93 ∇	Cobbles, visible throughout sides of hole when casing was pulled		
			5	6 5 3					
	NR								
			10	4 4 3					
	NR								
				5 5 5					
	NR								
			15	15 13 8		Becomes medium gray			
	20								
			20						
			25	1 1 1		Silty SAND with little to some gravel, medium gray, moist to wet (SM)	Fill Natural SLOUGH after recasing		
	NR					Appearance of grass blades, suggesting top of natural soil			
			30						
	NR								

BORING TERMINATED AT 31'

Note: No analytical sample collected due to poor recovery

Woodward-Clyde Consultants

SAMPLE
KEY:Standard Penetration
TestDanees and
Moore

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C				93C0036		LOG OF TEST PIT NO: 2	
DATE STARTED: 1/25/93 COMPLETED: 1/25/93				TOTAL DEPTH: 5 FT.		SURFACE ELEV: 59.23 FT.	
LOCATION: SEE MAP NEAR FUEL FARM #2				TOTAL NO. OF SAMPLES: 1			
				LOGGED BY: J. WALLACE			
				EXCAVATION METHOD: PC120 TRACKHOE			
				EXCAVATION AGENCY: V & J, INC.			
Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)	
		Interval	Type	Number			
						Grass/weed covering Sandy GRAVEL with little silt, cobbles present, brown, moist (GW)	
			J	SS-3		Becomes green and dark gray to black	
						Becomes reddish brown	
TEST PIT TERMINATED AT 5'							
COMMENTS:							
SAMPLE TYPE: B = Bulk (bag) J = Jar MB = Minibag				Woodward-Clyde Consultants 			PAGE 1 OF 1

PROJECT: PARCELS 2 AND C

93C0036

LOG OF TEST PIT NO: 3

DATE STARTED: 1/25/93 COMPLETED: 1/25/93

TOTAL DEPTH: 4.5 FT.

SURFACE ELEV: 58.75 FT.

DEPTH TO GW: N/A FT.

LOCATION: SEE MAP

TOTAL NO. OF SAMPLES: 1

LOGGED BY: J. WALLACE

EXCAVATION METHOD: P120 TRACKHOE

EXCAVATION AGENCY: V & J, INC.

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
			J	SS-4		Grasses/weeds covering Sandy GRAVEL with little silt, cobbles and concrete present, dark brown, moist (GM) Becomes greenish gray, Becomes reddish brown

TEST PIT TERMINATED AT 4.5'

COMMENTS:

SAMPLE
TYPE:B = Bulk (bag) J = Jar
MB = MinibagWoodward-Clyde Consultants 

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C

93C0036

LOG OF TEST PIT NO: 4

DATE STARTED: 1/25/93 COMPLETED: 1/25/93

TOTAL DEPTH: 5 FT.

SURFACE ELEV: 58.80 FT.

DEPTH TO GW: N/A FT.

LOCATION: SEE MAP

TOTAL NO. OF SAMPLES: 1

LOGGED BY: J. WALLACE

EXCAVATION METHOD: PC120 TRACKHOE

EXCAVATION AGENCY: V & J INC.

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
			J	SS-5		Top soil, weeds/grasses covering Sandy GRAVEL with little silt, cobbles, dark brown, moist (GM) Becomes greenish gray Becomes reddish brown

TEST PIT TERMINATED AT 5'

COMMENTS:

SAMPLE TYPE: B = Bulk (bag) J = Jar
MB = MinibagWoodward-Clyde Consultants 

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C		93C0036	LOG OF TEST PIT NO: 5	
DATE STARTED: 1/26/93 COMPLETED: 1/26/93		TOTAL DEPTH: 4.5 FT.	SURFACE ELEV: 57.83 FT.	DEPTH TO GW: N/A FT.
LOCATION: SEE MAP FORMER WASHRACK AREA		TOTAL NO. OF SAMPLES: 2		
		LOGGED BY: J. WALLACE		
		EXCAVATION METHOD: P120 TRACKHOE		
		EXCAVATION AGENCY: V & J, INC.		

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
						Grasses, weeds covering over Sandy gravel with silt, dark brown, moist (GM) (Possibly FILL)
			J Grab	SS-6		Sandy SILT with gravel, dark gray and grayish green, moist (ML)
			J Grab	SS-7		Silty fine to coarse sand with little gravel, reddish brown, moist (SM)

TEST PIT TERMINATED AT 4.5'

COMMENTS: Sampled the 2 ft. horizon 2-4 bgs and below

Note: SS-6 not sent to lab

SAMPLE TYPE:	B = Bulk (bag) J = Jar MB = Minibag	Woodward-Clyde Consultants 	PAGE 1 OF 1
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PROJECT: PARCELS 2 AND C				93C0036		LOG OF TEST PIT NO: 6	
DATE STARTED: 1/26/93 COMPLETED: 1/26/93				TOTAL DEPTH: 4 FT.		SURFACE ELEV: 53.75 FT. DEPTH TO GW: N/A FT.	
LOCATION: SEE MAP SOUTH SIDE OF FORMER MAINTENANCE BUILDING 2				TOTAL NO. OF SAMPLES: 1			
				LOGGED BY: J. WALLACE			
				EXCAVATION METHOD: PC120 TRACKHOE			
				EXCAVATION AGENCY: V & J, INC.			
Graphic Log	Depth (feet)	SAMPLE			VISUAL DESCRIPTION (USCS)		
Interval	Type	Number	% Water Content				
					Sparse grass covering 3/4" crush rock cover (10" thick) (FILL)		
		J	SS-8		Fine to coarse sandy GRAVEL with silt, cobbles, boulders, reddish brown, moist (GM)		
BORING TERMINATED AT 4'							
COMMENTS:							
SAMPLE TYPE: B = Bulk (bag) J = Jar MB = Minibag				Woodward-Clyde Consultants 			PAGE 1 OF 1

PROJECT: PARCELS 2 AND C				93C0036		LOG OF TEST PIT NO: 7	
DATE STARTED: 1/26/93 COMPLETED: 1/26/93				TOTAL DEPTH: 4.5 FT.		SURFACE ELEV: 53.55 FT. DEPTH TO GW: N/A FT.	
LOCATION: WEST SIDE OF FORMER MAINTENANCE BUILDING #2				TOTAL NO. OF SAMPLES: 1			
				LOGGED BY: J. WALLACE			
				EXCAVATION METHOD: PC120 TRACKHOE			
				EXCAVATION AGENCY: V & J, INC.			
Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)	
Interval	Type	Number					
			J Grab	SS-9		≥ 3/4" crushed rock, gray-brown(GP) Reddish brown and gray black horizon of laminar caliche-like layers Fine to coarse sandy GRAVEL, reddish brown, moist	
TEST PIT TERMINATED AT 4.5'							
COMMENTS:							
SAMPLE TYPE: B = Bulk (bag) J = Jar MB = Minibag				Woodward-Clyde Consultants 			PAGE 1 OF 1

PROJECT: PARCELS 2 AND C		93C0036		LOG OF TEST PIT NO: 9	
DATE STARTED: 1/26/93		COMPLETED: 1/26/93		TOTAL DEPTH: 9 FT.	SURFACE ELEV: 62.08 FT.
LOCATION: JUST WEST OF BH-14		TOTAL NO. OF SAMPLES: 1			
		LOGGED BY: J. WALLACE			
		EXCAVATION METHOD: PC120 TRACKHOE			
		EXCAVATION AGENCY: V & J, INC.			

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
						Grasses, weeds covering
						Fine to coarse GRAVEL with trace silt and boulders (to > 6 ft. diameter), medium brown, moist (GP) (FILL)
			Grab J	SS-12		Seepage

TEST PIT TERMINATED AT 9'

COMMENTS: A few pieces of lumber observed in fill

SAMPLE TYPE: B = Bulk (bag) J = Jar
MB = Minibag

Woodward-Clyde Consultants

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C

93C0036

LOG OF TEST PIT NO: 10

DATE STARTED: 1/26/93 COMPLETED: 1/26/93

TOTAL DEPTH: 8.5 FT.

SURFACE ELEV: 62.39 FT.

DEPTH TO GW: 7 FT.

LOCATION:

FORMER OIL CHANGE
AREA

TOTAL NO. OF SAMPLES: 1

LOGGED BY: J. WALLACE

EXCAVATION METHOD: PC120 TRACKHOE

EXCAVATION AGENCY: V & J, INC.

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
	5					Fine sandy SILT with little gravel, medium brown and purplish gray and gray, moist (ML) (FILL)
		Grab J		SS-13		
						COBBLES (GP)

TEST PIT TERMINATED AT 8.5'

COMMENTS:

SAMPLE
TYPE:B = Bulk (bag) J = Jar
MB = MinibagWoodward-Clyde Consultants 

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C

93C0036

LOG OF TEST PIT NO: 14

DATE STARTED: 1/27/93 COMPLETED: 1/27/93

TOTAL DEPTH: 6 FT.

SURFACE ELEV: 99.34 FT.

DEPTH TO GW: N/A FT.

LOCATION: SPOIL AREA C
NORTHEAST SIDE

TOTAL NO. OF SAMPLES: 1

LOGGED BY: J. WALLACE

EXCAVATION METHOD: PC120 TRACKHOE

EXCAVATION AGENCY: V & J, INC.

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
						Grassses/weeds covering
						Silty SAND with gravel and cobbles, medium brown, moist (SM) (FILL)
			Grab	SS-19		
			J			
						Sandy GRAVEL with silt. Gravel and cobbles range from <1 inch to >1 ft. dia., medium brown, moist (GM) (FILL)
	5					

TEST PIT TERMINATED AT 6'

COMMENTS:

SAMPLE
TYPE:B = Bulk (bag) J = Jar
MB = MinibagWoodward-Clyde Consultants 

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C

93C0036

LOG OF TEST PIT NO: 15

DATE STARTED: 1/28/93 COMPLETED: 1/28/93

TOTAL DEPTH: 4.5 FT.

SURFACE ELEV: 49.03 FT.

DEPTH TO GW: N/A FT.

LOCATION: NATURAL SURFACE WEST
OF SPOIL AREA C

TOTAL NO. OF SAMPLES: 1

LOGGED BY: J. WALLACE

EXCAVATION METHOD: PC120 TRACKHOE

EXCAVATION AGENCY: V & J, INC.

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
						Grasses/weeds covering Sandy GRAVEL with silt, dark brown, moist (GM)
			Grab	SS-26		Organic rich silty SAND grading to medium brown, reddish brown medium sand, black, moist (SM)
						Sandy GRAVEL, cobbles, small BOULDERS reddish brown, moist (GP)

TEST PIT TERMINATED AT 4.5'

COMMENTS:

SAMPLE
TYPE:B = Bulk (bag) J = Jar
MB = MinibagWoodward-Clyde Consultants 

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C

93C0036

LOG OF TEST PIT NO: 16

DATE STARTED: 1/28/93 COMPLETED: 1/28/93

TOTAL DEPTH: 5 FT.

SURFACE ELEV: 43.20 FT.

DEPTH TO GW: N/A FT.

LOCATION: SOUTHWEST CORNER OF
PARCEL 2

TOTAL NO. OF SAMPLES: 1

LOGGED BY: J. WALLACE

EXCAVATION METHOD: PC120 TRACKHOE

EXCAVATION AGENCY: V & J, INC.

Graphic Log	Depth (feet)	SAMPLE			% Water Content	VISUAL DESCRIPTION (USCS)
		Interval	Type	Number		
						Grasses/weeds covering Organic rich sandy gravel, dark brown, moist, (TOPSOIL)
			Grab J	SS-27		Sandy GRAVEL reddish brown, moist, (GP)

TEST PIT TERMINATED AT 5'

COMMENTS:

SAMPLE TYPE: B = Bulk (bag) J = Jar
MB = MinibagWoodward-Clyde Consultants 

PAGE 1 OF 1

PROJECT: PARCELS 2 AND C						93C0036	LOG OF BORING NO: SB1						
DATE STARTED: 1/28/93 COMPLETED: 1/29/93						TOTAL DEPTH: 25.5 FT.	SURFACE ELEV: 80.67FT.	DEPTH TO GW: FT.					
LOGGED BY: T. BOOTH						PIEZOMETER SCREENED INTERVAL BGS: N/A TO FT.							
DRILLING METHOD: AIR ROTARY						INCLINOMETER: N/A							
DRILLING EQUIPMENT: SCHRAMM						LOCATION: FORMER MAINTENANCE AREA, PARCEL 2							
DRILLING AGENCY: GEO-TECH						TOTAL NUMBER OF SAMPLES: 1							
Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content (*) in percent					VISUAL DESCRIPTION (USCS)	REMARKS		
					10	20	30	40	50				
										Fine to coarse SAND and GRAVEL and cobbles with some silt, black-gray (GW/GP) (FILL) perched water Little silt, to clay As above	From cuttings: 6" -3.5' all rock, (cobbles and boulders,) black, angular Easier drilling -Lab sample Fill		
	1	NR	5	18 18 25									
	2	NR	9 9 13										
			10										
			15										
			5	50/6									
	25												
			20	5 15 50						Sandy medium GRAVEL to gravelly medium to coarse sand, some silt, brown, gray, with little to some silt (GM)	Natural - Gravel blocks sampler after 6" of drilling		
	35												
			15 20 20										
	NR		25										
BORING TERMINATED AT 27'													
Woodward-Clyde Consultants SAMPLE KEY: Dames and Moore Dames and Moore PAGE 1 OF 1													

PROJECT: 93C0036A		PARCELS 2, AND C		LOG OF BORING NO: SB2	
DATE STARTED: 3/2/93		COMPLETED: 3/2/93		TOTAL DEPTH: 28 FT.	SURFACE ELEV: 69.24 FT.
LOGGED BY: G. DAVIS		PIEZOMETER SCREENED INTERVAL BGS: N/A TO FT.			
DRILLING METHOD: AIR O-DEX		INCLINOMETER: N/A			
DRILLING EQUIPMENT: NODWELL		LOCATION: FORMER FUELING AREA, PARCEL 2			
DRILLING AGENCY: SOIL SAMPLING SERVICE		TOTAL NUMBER OF SAMPLES: 7 TOTAL, 1 TO LAB			

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent 10 20 30 40 50	VISUAL DESCRIPTION (USCS)	REMARKS
	0		0			(Dense), sandy medium GRAVEL with some silt, brown, silty, very wet (GM)(FILL)	Casing is too loose sample is all sluff, sampler sinks
	15		15	30 36 30		Very dense with some gravel, silty, coarse SAND, gravelly, gray-brown, very wet (SM) (FILL)	No odor
	0		24	24 30 32		As above	
	5		24	24 29 32		As above	
	0		27	15 18 21		As above to 25' then:	[Lab sample at 27.5-28] Fill
	75		27	15 22 28		Very dense sandy SILT with wood and grass debris, gray brown, (ML)	Natural

BORING TERMINATED AT 28'



PROJECT: PARCELS 2 AND C		93C0036	LOG OF BORING NO: SB3	
DATE STARTED: 3/1/93		COMPLETED: 3/1/93	TOTAL DEPTH: 36.5 FT.	SURFACE ELEV: 95.80 FT. DEPTH TO GW: FT.
LOGGED BY: G. DAVIS		PIEZOMETER SCREENED INTERVAL BGS: N/A TO FT.		
DRILLING METHOD: O-DEX		LOCATION: TOP OF HILL, PARCEL 2		
DRILLING EQUIPMENT: NODWELL		INCLINOMETER: N/A		
DRILLING AGENCY: SOIL SAMPLING SERVICE		TOTAL NUMBER OF SAMPLES: 6 TOTAL, 1 TO LAB		

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content (*) in percent 10 20 30 40 50	VISUAL DESCRIPTION (USCS)	REMARKS
			5	40+		Very dense sandy medium to coarse GRAVEL with some silt, gray, damp (GM) (FILL)	No sample at 2.5
			10	50			
			15	32		As above	
			20	23			
			25	19		As above, wet	
			30	22			
			35	24			
			40	19			
			45				
			50				
			55				
			60				
			65				
			70				
			75				
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PROJECT: PARCELS 2 AND C

93C0036

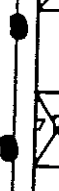
LOG OF BORING NO: SB3

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent 10 20 30 40 50	VISUAL DESCRIPTION (USCS)	REMARKS	Well Construction
☒			35	75+		As above		

BORING TERMINATED AT 36.5'



PROJECT: PARCEL 2 AND C		93C0036	LOG OF BORING NO: SB4	
DATE STARTED: 3/1/93 COMPLETED:		TOTAL DEPTH: 32 FT.	SURFACE ELEV: 74.2 FT.	DEPTH TO GW: FT.
LOGGED BY: G. DAVIS		PIEZOMETER SCREENED INTERVAL BGS: N/A TO FT.		
DRILLING METHOD: O-DEX		LOCATION: DEBRIS AREA NEAR MW-3, PARCEL 2		
DRILLING EQUIPMENT: NODWELL		INCLINOMETER: N/A		
DRILLING AGENCY: SOIL SAMPLING SERVICE		TOTAL NUMBER OF SAMPLES: 8 TOTAL, 1 TO LAB		

Graphic Log	Sample Int.	Recovery %	Depth (feet)	Blow Count (per 6 in.)	N-Value (Δ) per foot and Water Content ($\star$) in percent	10	20	30	40	50	VISUAL DESCRIPTION (USCS)	REMARKS
	1	25	5	5							Medium dense brown silty medium SAND with gravel, wet (SM)	Water encountered at approx. 3.0 bgs
	2	10	4	3							Loose gray sandy SILT with some gravel, wet (ML)	
	3	5	10	4							Medium dense, sandy silty medium GRAVEL brown, (GM)	No odor
	4	5	7	50 / 4"							Very dense silty medium GRAVEL with some sand, brown, wet	No odor
	5	5	8	5							As above, damp	
	6	5	11	10								
	7	50	8	100							Very dense, damp	Lab sample at 28.5 to 29
	8	15	24	30							As above, damp to dry, grass, plant detritus	Fill Natural

BORING TERMINATED AT 32'



Table 1: Test Pit Log Summary

Test Pit Number	Top Depth (ft)	Bottom Depth (ft)	USCS Group Symbol	Soil Name	Material Description	Estimated Percentages (1)				LA Abrasion % Loss	
						Fines	Sand	Gravel	Cobbles		Boulders
Test Pit TP-1											
1	0	5	GP-GM	GRAVEL with cobbles and boulders, sand, and silt	Fine to coarse, subrounded to subangular gravel, subrounded to subangular cobbles, subround to subangular boulders (approximately 12 to 15 inch), fine to coarse sand, nonplastic fines; FILL.	10	20	30	40		
1	5	10	GM	Silty GRAVEL with cobbles and boulders, and sand	Fine to coarse, subrounded to subangular gravel, subrounded to subangular cobbles, subround to subangular boulders (approximately 12 to 15 inch), fine to coarse sand, nonplastic fines; FILL.	15	25	30	30		
1	10	15	SM	Silty SAND with gravel, cobbles, and boulders	Fine to coarse sand, nonplastic silt, fine to coarse, subrounded to subangular gravel, subrounded to subangular cobbles, subround to subangular boulders (approximately 12 to 15 inch); FILL.	20 17	30 39	30 32	20 12	31%	
1	15	17	SM	Silty SAND with gravel, and cobbles	Fine to coarse, subangular to subrounded sand, nonplastic silt, fine to coarse, subrounded to subangular gravel, subrounded to subangular cobbles (3 to 8 inch); FILL.	40	30	15	15		
Test Pit TP-2											
2	0	17	GP-GM	GRAVEL with cobbles and boulders, sand, and silt	Light brown fine to coarse, round to subangular gravel, fine to coarse sand, rounded to subangular cobbles and boulders (15 inch maximum), nonplastic silt; 2 foot square concrete debris @10 feet; water @ 17 feet; FILL.	10	20	35	35		
2	17	23	GP-GM	GRAVEL with cobbles and boulders, sand, and silt	Light gray fine to coarse, round to subangular gravel, fine to coarse sand, rounded to subangular cobbles and boulders (15 inch maximum), nonplastic silt; FILL.	5	25	35	35		
Test Pit TP-3											
3	0	21	GP-GM	GRAVEL with cobbles and boulders, sand, and silt	Light gray fine to coarse, round to subangular gravel, fine to coarse sand, rounded to subangular cobbles and boulders (20 inch maximum), nonplastic silt; water @ 16 feet; FILL.	5 12	15 38	40 40	40 10		

Notes:

- (1) Visual Estimates in the field were based on weight. The amounts shown for fines and sand were modified based on laboratory findings.
(2) Bold italicized numbers indicate the percentages based upon sieve analyses of obtained samples. Sample sizes may not necessarily be representative, as determined by AASHTO T2.

Table 1: Test Pit Log Summary

Test Pit Number	Top Depth (ft)	Bottom Depth (ft)	USCS Group Symbol	Soil Name	Material Description	Estimated Percentages (1)				LA Abrasion % Loss
						Fines	Sand	Gravel	Cobbles	
Test Pit TP-4										
4	0	5	GM	Silty GRAVEL with cobbles and boulders, and sand	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders (15 inch maximum), nonplastic silt; FILL.	25	25	25	25	
4	5	10	GM	Silty GRAVEL with cobbles and boulders, and sand	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders (15 inch maximum), nonplastic silt; FILL.	35	30	20	15	
4	10	15	SM	Sandy SILT with gravel, cobbles and boulders	Medium plasticity silt, fine to coarse sand, fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders (15 inch maximum); water @ 11 feet; FILL.	45	25	15	15	
4	15	17	GM	Silty GRAVEL with cobbles and boulders, and sand	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders (15 inch maximum), nonplastic silt; NATIVE.	25	25	25	25	
Test Pit TP-5										
5	0	20	GM	Silty GRAVEL with cobbles and boulders, and sand	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders (15 inch maximum), nonplastic silt; water @ 13 feet; becomes gray @ 15 feet; FILL.	15	20	25	40	Not Testable
Test Pit TP-6										
6	0	5	GP-GM	GRAVEL with cobbles, sand, and silt	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles (8 inch maximum), and nonplastic silt; FILL.	10	30	50	10	
6	5	20	GP-GM	GRAVEL with cobbles, sand, and silt	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders, nonplastic silt; water at 18 feet; FILL.	10	25	35	30	25%
Test Pit TP-7										
7	0	5	GM	Silty GRAVEL with cobbles, and sand	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles (8 inch maximum), and nonplastic silt; FILL.	25	25	20	30	
7	5	10	GM	Silty GRAVEL with cobbles and boulders, and sand	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders, and nonplastic silt; FILL.	20	30	30	20	
7	10	14	GM	Silty GRAVEL with cobbles and boulders, and sand	Gray; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles and boulders, and nonplastic silt; FILL.	25	25	30	20	
Test Pit TP-8										
8	0	5	GM	Silty GRAVEL with cobbles and boulders, and sand	Light brown; fine to coarse, rounded to subangular gravel, rounded to subangular cobbles (5 inch maximum), and nonplastic silt; FILL.	35	25	30	10	

Notes:

- (1) Estimates of grain size distributions were made visually in the field were based on estimated weight. The amounts shown for fines and sand were modified based on laboratory findings.
- (2) Bold italicized numbers indicate the percentages based upon sieve analysis of obtained samples. Sample sizes may not necessarily be representative, as determined by AASHTO T2.



TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-1		
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO		
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 65 feet		GROUND WATER DEPTH not encountered		START TIME 0845		
FINISH TIME 0935													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5	GRAB	1.1			GC		FILL. Light brown to gray, wet, clayey GRAVEL. Interlayered pockets of sandy CLAY. Encountered minor wood debris and several subrounded to fractured boulders. [Soil Type 1] Moisture-density gauge test results: wet density = 121.7, dry density = 121.7, percent moisture = 10.2%	12.2	19.5	39	16		
10							Bottom of test pit at 7 feet. Ground water not encountered. Excavation backfilled loosely with on-site soil on 5/16/2012.						



TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-2		
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO		
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 50 feet		GROUND WATER DEPTH 6 feet		START TIME 0940		
FINISH TIME 1010													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5	▽			A-2	GC		FILL. Brown, damp, clayey GRAVEL, with subangular cobbles. [Soil Type 1]						
							Encountered large boulder and heavy groundwater flow at approximately 6 feet bgs.						
10							Bottom of test pit at 7 feet. Ground water encountered at 6 feet. Excavation backfilled loosely with on-site soil on 5/16/2012.						



11917 NE 95th Street, Vancouver, Washington 98682
Phone: 360-823-2900, Fax: 360-823-2901
www.columbiawestengineering.com

TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-3			
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO		DATE 5/16/12	
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 60 feet		GROUND WATER DEPTH 5 feet		START TIME 1018		FINISH TIME 1040	
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS		Moisture Content (%)	Passing No. 20 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torgvane Shear (tsf)
5	▽			A-2	GC		FILL. Brown, moist to wet, medium dense, silty GRAVEL with sand, cobbles and some boulders. [Soil Type 1]							
							Increased plasticity of fines at 5 feet bgs.							
10							Encountered large boulders at approximately 8 feet bgs. Bottom of test pit at 8 feet. Ground water encountered at 5 feet. Excavation backfilled loosely with on-site soil on 5/16/2012.							

TEST PIT LOG - GEOTECHNICAL TP 1 THROUGH 11.GPJ TESTPITGEO.GDT 6/11/12



TEST PIT LOG

PROJECT NAME Cascade Business Park						CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-4			
PROJECT LOCATION North Bonneville, Washington						CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO			
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 100 feet		GROUND WATER DEPTH not encountered		START TIME 1045			
FINISH TIME 1115													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5				A-2	GC		FILL. Gray-brown, damp to wet, loose, rounded GRAVEL with clay, angular cobbles, and boulders. [Soil Type 1] Several 2 to 3-foot diameter boulders encountered at approximately 2 feet bgs. Encountered interlayered pockets of bluish-gray, moist to wet, stiff, CLAY. Encountered subrounded boulders and increased moisture content at approximately 7.5 feet bgs.						
10							Bottom of test pit at 12 feet. Ground water not encountered. Excavation backfilled loosely with on-site soil on 5/16/2012.						



TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-5		
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO		
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 80 feet		GROUND WATER DEPTH not encountered		START TIME 1135		
FINISH TIME 1200													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5				A-2	GC		FILL. Brown, medium dense, wet, sandy GRAVEL with clay, with some boulders. [Soil Type 1] An approximate 2-foot diameter boulder observed in the test pit side wall. Moisture-density gauge test results: wet density = 125.9, dry density = 112.9, percent moisture = 11.6% Moisture-density gauge test results: wet density = 120.1, dry density = 103.1, percent moisture = 16.5%. Increased sand content observed at test depth and location. Increased moisture content at 5 feet bgs. Bottom of test pit at 5 feet. Ground water not encountered. Excavation backfilled loosely with on-site soil on 5/16/2012.						
10													



TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-6		
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO		
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 65 feet		GROUND WATER DEPTH not encountered		START TIME 1205		
FINISH TIME 1245													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5	BAG	TP6.1		A-2	GC		FILL. Light brown, moist, medium dense, clayey GRAVEL with cobbles. [Soil Type 1] Moisture-density gauge test results: wet density = 119.0, dry density = 108.3, percent moisture = 9.9% Moisture-density gauge test results: wet density = 120.1, dry density = 106.4, percent moisture = 12.9% Increased sand and moisture content at 4 feet bgs. Increased clay content, occasional cobbles, and loose at 5 feet bgs. Organic odor at 8 feet bgs.	13.8	19.5	39	17		
10							Bottom of test pit at 9.5 feet. Ground water not encountered. Excavation backfilled loosely with on-site soil on 5/16/2012.						



TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC			PROJECT NO. 12058			TEST PIT NO. TP-7			
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO			DATE 5/16/12		
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 55 feet		GROUND WATER DEPTH not encountered		START TIME 1250			FINISH TIME 1320		
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS				Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5	GRAB	TP7.1		A-2	GW		FILL. Brown to gray, moist, medium dense, GAVEL with cobbles and some clay and sand. Angular boulder encountered at aproximately 1-foot bgs. Difficult excavation. [Soil Type 1]				17.1	2.9	0	0		
				A-5	CL		FILL. Dark gray, moist, stiff, gravelly CLAY with some wood debris. [Soil Type 1]									
				A-2	SW		Possibly native soil. Reddish-brown, very moist, dense to very dense, well graded SAND with some gravel and subrounded cobbles. [Soil Type 2]									
							Bottom of test pit at 8 feet. Ground water not encountered.									
10																



TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-8		
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO		
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 45 feet		GROUND WATER DEPTH not encountered		START TIME 1335		
FINISH TIME 1350													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5							FILL/Topsoil. Brown sandy SILT, with gravel. [Soil Type 1]						
				A-2	GP		Possibly native soil. Brown, moist, loose to medium dense, poorly graded, sandy GRAVEL with cobbles. Sand is medium- to coarse-textured. [Soil Type 2]						
10							Bottom of test pit at 10 feet. Ground water not encountered.						



TEST PIT LOG

PROJECT NAME Cascade Business Park						CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-9			
PROJECT LOCATION North Bonneville, Washington						CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO			
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 45 feet		GROUND WATER DEPTH not encountered		START TIME 1400			
FINISH TIME 1410													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5				A-2	GC		FILL. Brown, moist, medium dense, clayey GRAVEL with cobbles and some boulders. [Soil Type 1]						
							Encountered some buried organics at approximately 3.5 feet bgs.						
				A-2	SP		FILL. Light brown, moist, loose, fine-textured SAND. [Soil Type 1]						
				A-4	CL		FILL. Brown, moist, stiff, CLAY with gravel and cobbles. [Soil Type 1]						
10							Encountered a large boulder at approximately 8 feet bgs. Excavator refusal. Bottom of test pit at 8 feet. Ground water not encountered.						



TEST PIT LOG

PROJECT NAME Cascade Business Park							CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-10		
PROJECT LOCATION North Bonneville, Washington							CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO		
TEST PIT LOCATION See Figure 2							APPROX. SURFACE ELEVATION 50 feet		GROUND WATER DEPTH not encountered		START TIME 1415		
FINISH TIME 1430													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5				A-4			FILL/Topsoil. Dark brown, wet, SILT, with roots throughout. Some small rounded boulders encountered. [Soil Type 1]						
				A-4	CL		Brown, moist, soft, CLAY. Excavator Refusal at 3.5' on underlying rock. [Soil Type 1]						
							Bottom of test pit at 3.5 feet. Ground water not encountered.						
10													



TEST PIT LOG

PROJECT NAME Cascade Business Park						CLIENT HDJ Design Group, PLLC		PROJECT NO. 12058		TEST PIT NO. TP-11			
PROJECT LOCATION North Bonneville, Washington						CONTRACTOR L&S		EQUIPMENT Excavator		ENGINEER JLO			
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 50 feet		GROUND WATER DEPTH not encountered		START TIME 1435			
FINISH TIME 1630													
Depth (feet)	Sample Type	Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Pocket Penetrometer (tsf)	Torvane Shear (tsf)
5				A-6	CL		FILL. Brown to gray, damp to moist, medium stiff, CLAY with gravel and some cobbles. [Soil Type 1]						
							Color change to dark gray from approximately 3.5 to 4.5 feet bgs.						
				A-2	GC		Possibly native soil. Light brown to tan, damp, dense, rounded to subangular, clayey GRAVEL. [Soil Type 2]						
10							Bottom of test pit at 7 feet. Ground water not encountered.						

APPENDIX C

FIELD SAMPLING DATA SHEETS



Maul Foster & Alongi, Inc.

400 E. Mill Plain Blvd, Suite 400, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	Port of Skamania County	Sample Location	B6				
Project #	M0350.04.01	Sampler	Emily Hess				
Project Name	Cascades Business Park	Sampling Date	2/10/2022				
Sampling Event	February 2022	Sample Name	B6-W-45				
Sub Area		Sample Depth	45				
FSDS QA:	E. Hess 4/6/2022	Easting		Northing		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
					DTP-DTW	DTB-DTW	Pore Volume
2/10/2022	11:40	50		40		10	1.63

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	ORP	Turbidity
(3) Disposable Bailer	12:12:00 PM	1		9.11	12.9	1868			
Final Field Parameters									
	12:20:00 PM	2		9.42	13	761.8			

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations:

Very turbid (meter indicated "overrange" with each reading); no odor.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(3) Disposable Bailer	Groundwater	12:20:00 PM	VOA-Glass	3	No
			Amber Glass	6	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	11	

General Sampling Comments

Two-inch diameter temporary polyvinyl chloride screen set from 40 to 50 feet below ground surface in borehole. Collected duplicate sample (B6-W-45-DUP) at this location.

Signature _____

Maul Foster & Alongi, Inc.

400 E. Mill Plain Blvd, Suite 400, Vancouver, WA 98660 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	Port of Skamania County	Sample Location	B7				
Project #	M0350.04.01	Sampler	Sarah Colee				
Project Name	Cascades Business Park	Sampling Date	2/10/2022				
Sampling Event	February 2022	Sample Name	B7-W-25				
Sub Area		Sample Depth	25				
FSDS QA:	E. Hess 4/6/2022	Easting		Northing		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
					DTP-DTW	DTB-DTW	Pore Volume
2/10/2022	15:20	36		1.1		34.9	5.69

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	ORP	Turbidity
(2) Peristaltic Pump	3:10:00 PM	0.8	1	9.1	13	333.6			
	3:13:00 PM	1.6	1	8.98	12.8	321.9			
Final Field Parameters	3:16:00 PM	2.4	1	8.97	12.6	317			

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations:

Very turbid (meter indicated "overrange" with each reading); no odor.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	3:20:00 PM	VOA-Glass	3	No
			Amber Glass	6	No
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	11	

General Sampling Comments

Two-inch diameter temporary polyvinyl chloride screen set from 15 to 35 feet below ground surface in borehole.

Signature _____

APPENDIX D

PHOTOGRAPH LOG



PHOTOGRAPHS

Project Name: Port of Skamania County – Cascades Business Park
Project Number: M0350.04.001
Location: North Bonneville, Washington
Date: February 10, 2022

Photo No. 1.

Description

Groundwater purged from B6 using a disposable bailer and placed in a glass jar for parameter collection. Note elevated turbidity that was recorded as “Overrange” on the turbidity meter.



Photo No. 2.

Description

Sample bottles with groundwater collected from B6. Note settled sediment in glass vial and two polyethylene bottles. The polyethylene bottle on the right was filtered in the field using a 0.45-micron filter, and was used by the laboratory for dissolved metal analysis. The polyethylene bottle on the left was not filtered and was used by the laboratory for total metal analysis.



APPENDIX E

ARCHAEOLOGICAL MONITORING REPORT



CULTURAL RESOURCES REPORT COVER SHEET

DAHP Project Number: 2021-10-07237

Author: Jonathan Duelks

Title of Report: Archaeological Monitoring for the Cascades Business Park
Geotechnical Assessment, North Bonneville, Skamania County,
Washington

Date of Report: March 21, 2022

County(ies): Skamania Section: 38, 39 Township: 2N Range: 7E

Quad: Bonneville Dam, WA 7.5-minute Acres: n/a

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.



WILLAMETTE
CULTURAL RESOURCES ASSOCIATES, LTD.

TECHNICAL MEMORANDUM

Archaeological Monitoring for the
Cascades Business Park Geotechnical Assessment,
North Bonneville, Skamania County, Washington

Jonathan Duelks

March 21, 2022

Introduction

Willamette Cultural Resources Associates, Ltd. (WillametteCRA) was contracted by Maul Foster & Alongi, Inc. (MFA), to conduct archaeological monitoring of ground disturbing activities related to the Port of Skamania County's Cascades Business Park geotechnical assessment in North Bonneville, Skamania County, Washington. The project area (PA) is in Township 2 North, Range 7 East, Sections 38 and 39, Willamette Meridian (Figures 1 and 2). The Port of Skamania County owns the approximately 42-acre property (Skamania County parcel number 02072000020500).

The Washington State Department of Ecology requested archaeological monitoring and provided the funding for environmental cleanup at the Cascades Business Park site (May 2021). Ground disturbance involved in the cleanup included test pit excavation and drilling to depths ranging from 10 to 50 feet for soil collection, infiltration testing, and groundwater sampling. The Washington Department of Archaeology and Historic Preservation (DAHP) State Predictive Model indicates that the PA is in a "very high risk" area for encountering archaeological sites. However, the property has been heavily modified. Relevant to this study, over 20 million cubic yards of dredge material were dumped during channel widening of the Columbia River in 1981 and 1982 (Hess and Hughes 2021) resulting in between approximately 25 to 60 (potentially more) feet of fill across the property (Ordway and Lehto 2012). Existing conditions in the PA include short grass and occasional patches of shrubs and trees, cement, two large piles of boulders, and a few small piles of concrete fragments.

Archaeological Background

WillametteCRA reviewed records on file with the DAHP online database (WISAARD) to review previous archaeological studies and documented archaeological sites (Table 1) occurring within ½ mile of the PA. Prior archaeological investigations of the PA property include archaeological

Table 1. Archaeological Sites Within ½ Mile of the PA.

Arch. District	Site Number	Name	Description
Bonneville Dam Historic District (45DT13)	45SA5	The Caples Site	Precontact pit-house site.
	45SA9	Fort Cascades and Cascade Townsite	Large, multi-component site including Native American village occupied at contact, the fort, townsite, and fishwheels.
Other Sites (no district)	45SA4	n/a	Precontact, low-density surficial lithic scatter.
	45SA6	n/a	Post-contact (late-1800s - early 1900s) Native American fishing encampment,
	45SA7	n/a	Post-contact (late-1800s - early 1900s) Native American encampment.
	45SA8	n/a	Post-contact homestead.
	45SA10	n/a	Precontact encampment reported by Lewis and Clark. May actually be 45SA11.
	45SA11	The North Bonneville Site	Large, multi-component site.
	45SA14	n/a	Precontact shell midden (destroyed).
	45SA23	The Garrison Eddy Site	Precontact petroglyph boulder that has been relocated.

monitoring and pedestrian and shovel probe survey. An in-depth discussion of that research can be found in Solimano et al. (2016). The most significant finding of this research is the presence of the North Bonneville Archaeological District (NBAD), which was listed on the Nation Register of Historic Places in 1976. This district consists of six archaeological sites, one of which (45SA9), is the Historic Fort Cascades and Cascades Townsite. Site 45SA9 is located southeast of the current PA on the other side of Fort Cascades Dr., the road marking the site's northern boundary.

In 2010, WillametteCRA conducted archaeological monitoring of ground disturbing activities related to the installation of a sanitary sewer line (Ogle 2010). No archaeological materials were recovered. In 2016, WillametteCRA conducted an archaeological inventory of U.S. Army Corps of Engineers (USACE) and Bonneville Power Administration (BPA) lands that included the current PA (Solimano et al. 2016). Four sites (45SA9, 45SA10, 45SA14, 45SA23) surveyed for that inventory make up the North Bonneville Archaeological District. Of those four, only 45SA9 was relocated, the rest have either been destroyed (45SA14), relocated (45SA23), or have never been physically located (45SA10). No new resources were identified (Solimano et al 2016:77-80). Most recently, Archaeological Services Clark County (ASCC) conducted

pedestrian and shovel probe survey, excavating seven shovel probes along the northern boundary of the PA. No cultural material was recovered in the shovel probes (Gall and Smith 2019).

Monitoring and Results

WillametteCRA archaeologist Jonathan Duelks (M.A.) monitored geotechnical borings and test pit excavations associated with the project on February 9 and 10, 2022 (Figure 3).

Archaeological monitoring was conducted to observe and document cultural resources that may be exposed during all ground disturbing activities.

Emily Hess and Sarah Colee from MFA and Kaelan Hendrickson from Hart Crowser collected soil and groundwater samples from borings and test pits. A total of eight test pits were excavated using a Case 580 Super N Backhoe Loader with a 2-foot (ft.) bucket with teeth (Figures 4 and 5). Test pit excavation dimensions were, on average 3 ft. by 11 ft. by 11 ft. below surface (bs). A total of 18 bore holes were drilled. Sixteen borings were conducted by Pacific Soil and Water using an AMS Power Probe 9130-VTR-D with a 2¼-inch (in.) diameter inner sampling barrel (Figures 6-9). Samples were collected in five-foot increments to a maximum of depth of 10 ft. with one boring extended to 15 ft. The remaining two borings were conducted by Holt Drilling using a Sonic Rotary Terra Sonic TSi 150 Compact Crawler rubber track mounted Sonic Drill Rig with a 6-in. core barrel. Sonic Rotary samples were collected in five-foot increments to a maximum depth of 50 ft. (B-06) and 35 ft. (B-07). Monitoring occurred during the entirety of the drilling and excavation processes. Documentation included detailed field notes, sediment descriptions of all recovered core samples and back dirt piles, and photographs of test pits, back dirt piles and all core segments. All documentation is on file at WillametteCRA, Portland, Oregon.

No cultural resources were identified during geotechnical drilling and test pit monitoring. Nearly all the sediment observed was fill and dredge material. The northern half of the PA, between B-17 and B-01 (see Figure 3) was approximately 50 ft. lower in elevation, likely related to the original landform, the distribution of dredge material dumping, or a combination of the two. That sediment was primarily a homogenous, grey-brown or yellowish-brown, cobbly sand extending to depths of approximately 11 ft. bs; pockets of grey, sandy silt were common. One test pit, TP-08 recovered rounded river pebbles at a depth of approximately 10 ft. One bore, B-13 recovered a fine, brown, silty loam sediment between 9.5 and 10 ft. not seen in other borings. Ms. Colee and Mr. Duelks both noted that the sediment change was interesting and that it may represent a native sediment but this is merely speculation, as it was not clearly discernible in the 2¼-in. diameter view provided by the bore.

The southern portion of the PA, between TP-01 and TP-03 (see Figure 3) is at a higher elevation and exhibited stratigraphy similar to the upper 10 ft. in the northern PA. Those soils were typically a grey-brown gravelly, silty sand or sandy silt. Large pockets of grey sandy silt

were common. Boulders and cobbles were present throughout the larger test pit excavations. The two sonic drill bore holes, B-06 and B-07 reached depths of 50 and 35 ft. bs, respectively. These upper 10 ft. of sediments were the same as described above. Below 10 ft., B-06 sediments continued as brown, gravely silty sand until approximately 43 ft. bs where a lens of dark red silty clay extended to 45 ft. bs. The remaining 5 ft. of sediments were a blue-grey sandy silt with a transition to yellowish brown sand at 49 ft. bs.

Conclusions and Recommendations

WillametteCRA completed archaeological monitoring of ground-disturbing activities for the Cascade Business Park geotechnical assessment. WillametteCRA conducted monitoring on February 9 and 10, 2022. Archaeological monitoring for the geotechnical assessment is complete. We identified no archaeological resources during the excavations and drilling. Nearly all sediment observed was fill and dredge material that had been placed on the landform in 1981 (Hess and Hughes 2021; Ordway and Lehto 2012). The only exception to this was the potential presence of native sediment observed in the northern portion of the PA (Core B-13). Because of this, the need for additional archaeological investigations should be reassessed based on construction plans for the Cascade Business Park and proposed depth of disturbance. More specifically, the need for archaeological monitoring should be reassessed if ground-disturbing activities extending beyond 9 to 10 ft. are planned for the area surrounding B-13. The potential for finding intact archaeological deposits in fill or dredge deposits is very low, therefore the potential for encountering intact archaeological deposits during future ground disturbing work across most of the property is also low.

Should unanticipated archaeological or historical resources be encountered during future activities at this location, all ground-disturbing activity in the vicinity of the find should be halted and the Washington DAHP notified immediately. In the event that evidence of human skeletal remains is encountered during future work, all ground-disturbing activity near the discovery should be halted immediately, efforts taken to protect such evidence in place, and the Washington DAHP, Washington State Police, appropriate Tribes, and Skamania County Medical Examiner promptly notified to ensure compliance with RCW 27.44.040.

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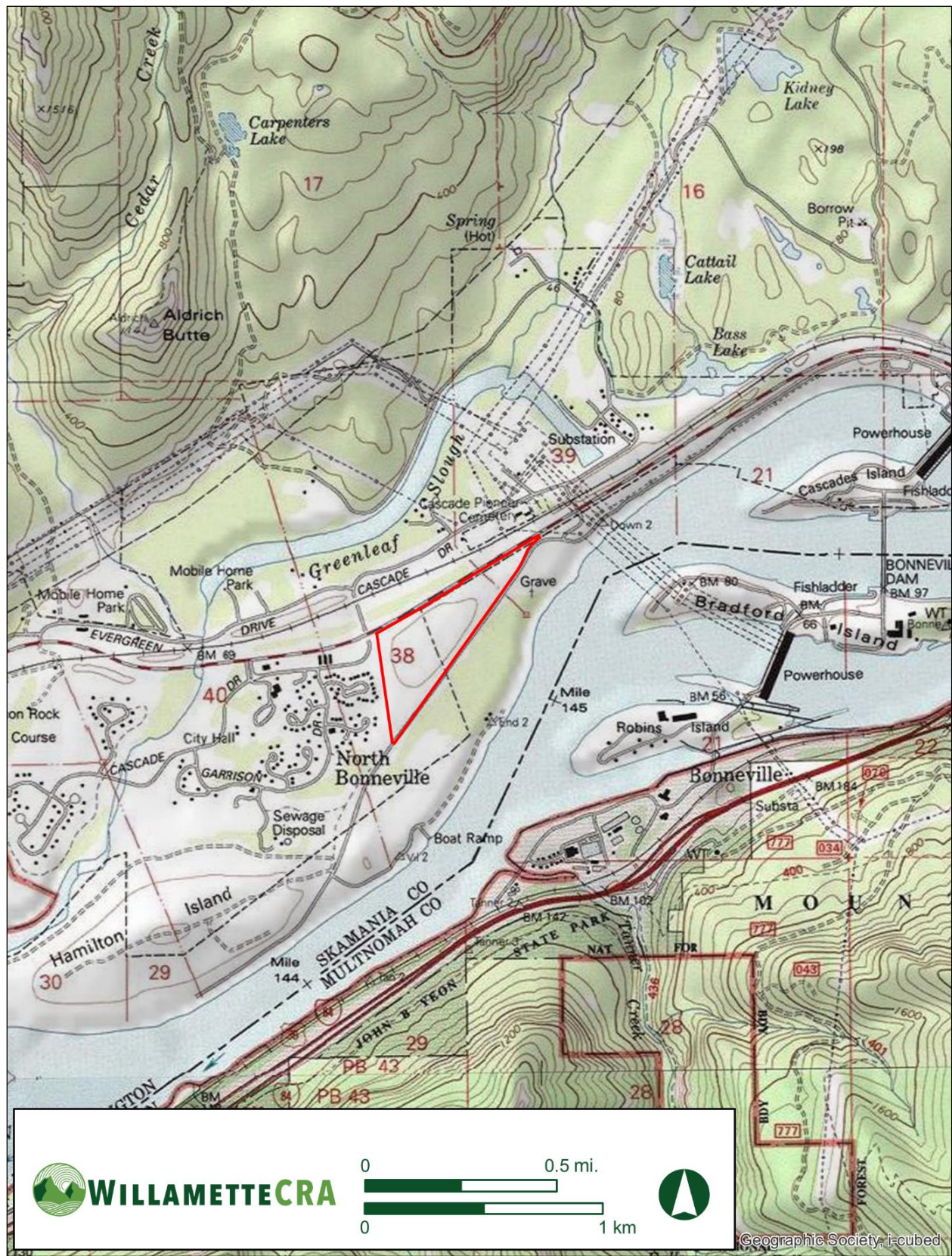


Figure 1. Project location map.



Figure 2. Current aerial imagery of PA.

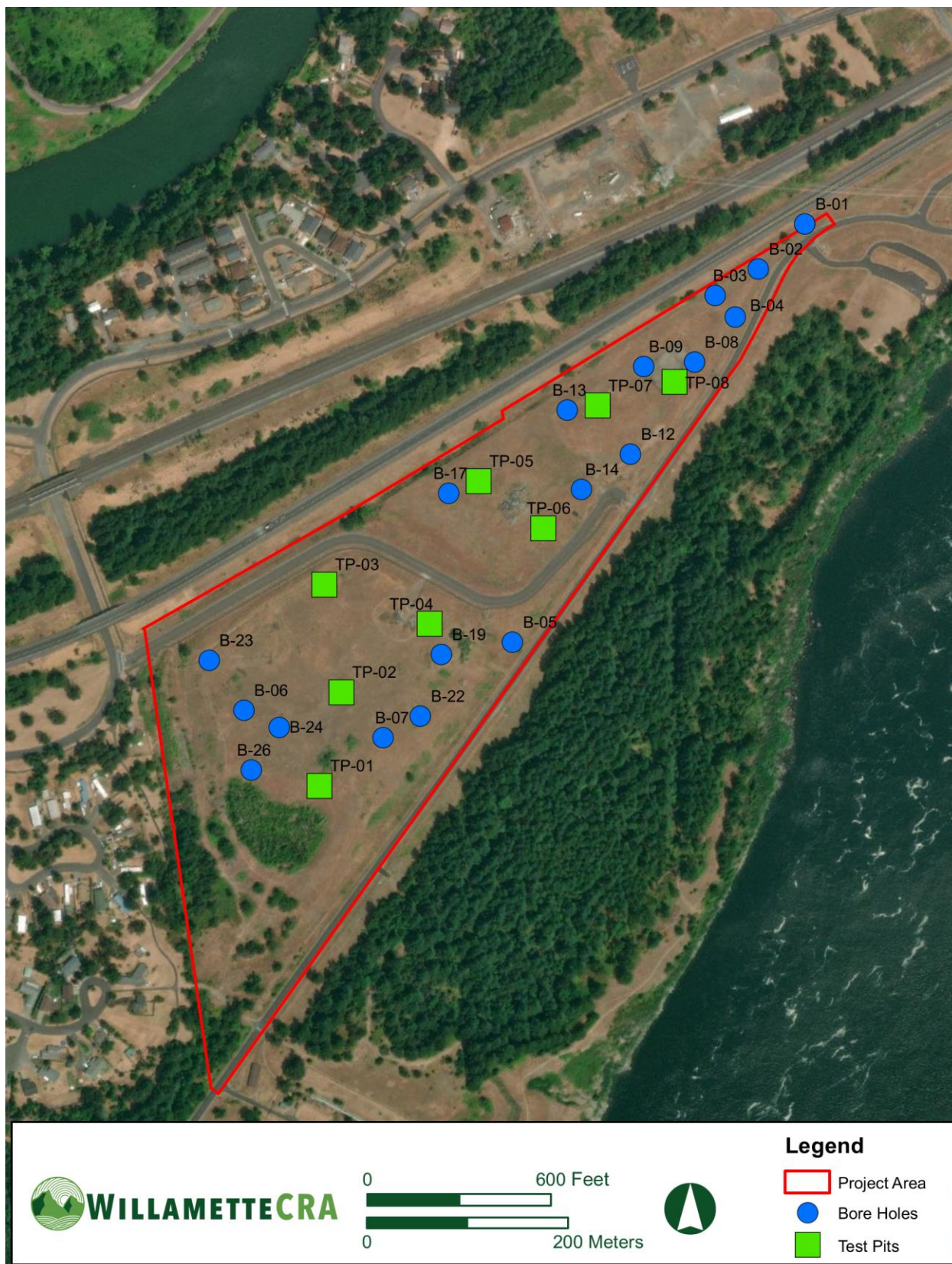


Figure 3. Overview of test pit and borehole locations.



Figure 4. Excavation of TP-02, view southwest.



Figure 5. Plan view of TP-06 at final depth, 11 feet below surface.



Figure 6. Overview of sonic drilling at B-06, view northeast.



Figure 7. B-06 Sediments from between 0 and 5 feet below surface.



Figure 8. Overview of drilling work area, view west.

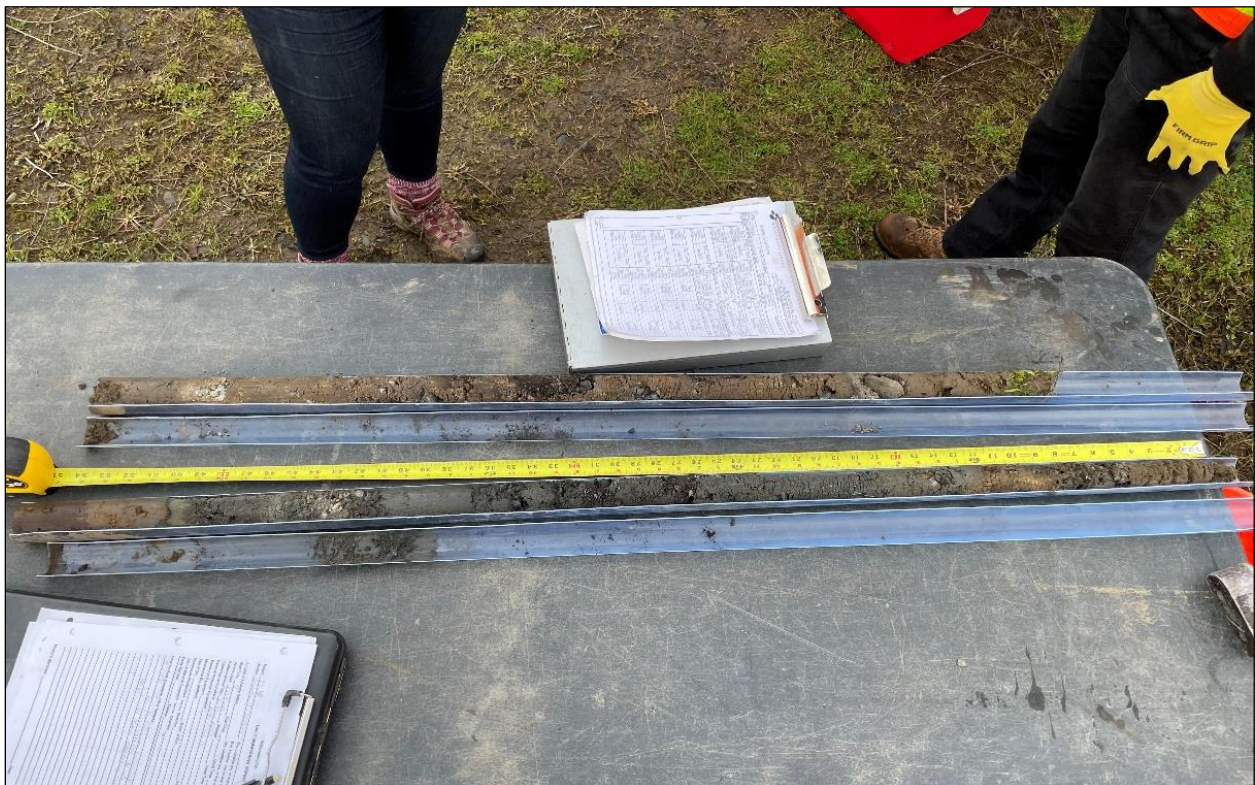


Figure 9. B-13 sediments, 0-5 feet below surface (top) and 5-10 feet below surface (bottom).

APPENDIX F

ANALYTICAL LABORATORY REPORT





ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Monday, March 7, 2022

Emily Hess

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

RE: A2B0415 - POSC-Cascade Business Park - M0350.04.001

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A2B0415, which was received by the laboratory on 2/11/2022 at 11:30:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: pnerenberg@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler#1	2.6 degC	Cooler#2	3.9 degC
Cooler#3	1.9 degC	Cooler#4	1.1 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

Philip Nerenberg, Lab Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212****ANALYTICAL REPORT FOR SAMPLES****SAMPLE INFORMATION**

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B6-S-11	A2B0415-01	Soil	02/10/22 09:30	02/11/22 11:30
B6-S-21	A2B0415-02	Soil	02/10/22 09:50	02/11/22 11:30
B6-S-31	A2B0415-03	Soil	02/10/22 10:15	02/11/22 11:30
B6-S-41	A2B0415-04	Soil	02/10/22 11:00	02/11/22 11:30
B6-S-49.5	A2B0415-05	Soil	02/10/22 11:20	02/11/22 11:30
B6-W-45	A2B0415-06	Water	02/10/22 12:20	02/11/22 11:30
B6-W-45-DUP	A2B0415-07	Water	02/10/22 12:20	02/11/22 11:30
B7-S-11	A2B0415-08	Soil	02/10/22 13:20	02/11/22 11:30
B7-S-21	A2B0415-09	Soil	02/10/22 13:50	02/11/22 11:30
B7-S-29.5	A2B0415-10	Soil	02/10/22 14:20	02/11/22 11:30
B7-S-35	A2B0415-11	Soil	02/10/22 15:00	02/11/22 11:30
B7-W-25	A2B0415-12	Water	02/10/22 15:20	02/11/22 11:30
B2-S-6	A2B0415-14	Soil	02/09/22 12:55	02/11/22 11:30
B1-S-8.5	A2B0415-18	Soil	02/09/22 13:50	02/11/22 11:30
B4-S-8	A2B0415-21	Soil	02/09/22 12:20	02/11/22 11:30
B5-S-13.5	A2B0415-25	Soil	02/09/22 10:40	02/11/22 11:30
B3-S-5	A2B0415-27	Soil	02/09/22 14:25	02/11/22 11:30
B14-S-7	A2B0415-29	Soil	02/10/22 11:40	02/11/22 11:30
B14-S-9.5	A2B0415-30	Soil	02/10/22 11:45	02/11/22 11:30
NDU-S-0-5	A2B0415-31	Soil	02/09/22 10:40	02/11/22 11:30
NDU-S-0-5	A2B0415-32	Soil	02/09/22 10:40	02/11/22 11:30
NDU-S-5-10	A2B0415-33	Soil	02/09/22 10:45	02/11/22 11:30
NDU-S-5-10	A2B0415-34	Soil	02/09/22 10:45	02/11/22 11:30
SDU-S-0-5	A2B0415-35	Soil	02/09/22 08:30	02/11/22 11:30
SDU-S-0-5	A2B0415-36	Soil	02/09/22 08:30	02/11/22 11:30
SDU-S-5-10	A2B0415-37	Soil	02/09/22 08:35	02/11/22 11:30
SDU-S-5-10	A2B0415-38	Soil	02/09/22 08:35	02/11/22 11:30

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Philip Nerenberg, Lab Director

Page 2 of 105



ANALYTICAL REPORT

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business ParkProject Number: **M0350.04.001**

Project Manager: Emily Hess

Report ID:**A2B0415 - 03 07 22 1212**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-11 (A2B0415-01)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.1	25.0	mg/kg dry	1	02/17/22 20:55	NWTPH-Dx	
Oil	ND	22.2	50.0	mg/kg dry	1	02/17/22 20:55	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 86 %		Limits: 50-150 %	1	02/17/22 20:55	NWTPH-Dx	
B6-S-21 (A2B0415-02)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	10.8	25.0	mg/kg dry	1	02/17/22 21:35	NWTPH-Dx	
Oil	26.1	21.5	50.0	mg/kg dry	1	02/17/22 21:35	NWTPH-Dx	J
Surrogate: o-Terphenyl (Surr)		Recovery: 84 %		Limits: 50-150 %	1	02/17/22 21:35	NWTPH-Dx	
B6-S-31 (A2B0415-03)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.8	25.0	mg/kg dry	1	02/17/22 21:56	NWTPH-Dx	
Oil	ND	23.6	50.0	mg/kg dry	1	02/17/22 21:56	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 76 %		Limits: 50-150 %	1	02/17/22 21:56	NWTPH-Dx	
B6-S-41 (A2B0415-04)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	12.2	25.0	mg/kg dry	1	02/17/22 22:16	NWTPH-Dx	
Oil	69.8	24.4	50.0	mg/kg dry	1	02/17/22 22:16	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 75 %		Limits: 50-150 %	1	02/17/22 22:16	NWTPH-Dx	
B6-S-49.5 (A2B0415-05)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.9	25.0	mg/kg dry	1	02/17/22 22:36	NWTPH-Dx	
Oil	ND	23.9	50.0	mg/kg dry	1	02/17/22 22:36	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 79 %		Limits: 50-150 %	1	02/17/22 22:36	NWTPH-Dx	
B6-W-45 (A2B0415-06)				Matrix: Water		Batch: 22B0534		PRES
Diesel	0.223	0.139	0.278	mg/L	1	02/16/22 00:06	NWTPH-Dx	J
Oil	ND	0.278	0.556	mg/L	1	02/16/22 00:06	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 90 %		Limits: 50-150 %	1	02/16/22 00:06	NWTPH-Dx	
B6-W-45-DUP (A2B0415-07)				Matrix: Water		Batch: 22B0534		PRES
Diesel	0.225	0.125	0.250	mg/L	1	02/16/22 00:27	NWTPH-Dx	J
Oil	ND	0.250	0.500	mg/L	1	02/16/22 00:27	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 90 %		Limits: 50-150 %	1	02/16/22 00:27	NWTPH-Dx	

Apex Laboratories

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-S-11 (A2B0415-08)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.9	25.0	mg/kg dry	1	02/17/22 22:56	NWTPH-Dx	
Oil	ND	23.9	50.0	mg/kg dry	1	02/17/22 22:56	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 87 %	Limits: 50-150 %	1	02/17/22 22:56	NWTPH-Dx		
B7-S-21 (A2B0415-09)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.7	25.0	mg/kg dry	1	02/17/22 23:17	NWTPH-Dx	
Oil	ND	23.5	50.0	mg/kg dry	1	02/17/22 23:17	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 80 %	Limits: 50-150 %	1	02/17/22 23:17	NWTPH-Dx		
B7-S-29.5 (A2B0415-10)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.8	25.0	mg/kg dry	1	02/17/22 23:37	NWTPH-Dx	
Oil	ND	23.7	50.0	mg/kg dry	1	02/17/22 23:37	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 75 %	Limits: 50-150 %	1	02/17/22 23:37	NWTPH-Dx		
B7-S-35 (A2B0415-11)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	12.7	25.4	mg/kg dry	1	02/17/22 20:35	NWTPH-Dx	
Oil	29.9	25.4	50.7	mg/kg dry	1	02/17/22 20:35	NWTPH-Dx	J
Surrogate: o-Terphenyl (Surr)		Recovery: 81 %	Limits: 50-150 %	1	02/17/22 20:35	NWTPH-Dx		
B7-W-25 (A2B0415-12)				Matrix: Water		Batch: 22B0534		PRES
Diesel	ND	0.116	0.233	mg/L	1	02/16/22 00:47	NWTPH-Dx	
Oil	ND	0.233	0.465	mg/L	1	02/16/22 00:47	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 91 %	Limits: 50-150 %	1	02/16/22 00:47	NWTPH-Dx		
B2-S-6 (A2B0415-14)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.2	25.0	mg/kg dry	1	02/17/22 20:55	NWTPH-Dx	
Oil	ND	22.5	50.0	mg/kg dry	1	02/17/22 20:55	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 73 %	Limits: 50-150 %	1	02/17/22 20:55	NWTPH-Dx		
B1-S-8.5 (A2B0415-18)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	12.1	25.0	mg/kg dry	1	02/17/22 21:15	NWTPH-Dx	
Oil	ND	24.2	50.0	mg/kg dry	1	02/17/22 21:15	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 83 %	Limits: 50-150 %	1	02/17/22 21:15	NWTPH-Dx		

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business ParkProject Number: **M0350.04.001**

Project Manager: Emily Hess

Report ID:**A2B0415 - 03 07 22 1212**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B4-S-8 (A2B0415-21)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	10.5	25.0	mg/kg dry	1	02/17/22 21:35	NWTPH-Dx	
Oil	ND	21.0	50.0	mg/kg dry	1	02/17/22 21:35	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 85 %	Limits: 50-150 %	1	02/17/22 21:35	NWTPH-Dx		
B5-S-13.5 (A2B0415-25)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	12.1	25.0	mg/kg dry	1	02/17/22 21:56	NWTPH-Dx	
Oil	ND	24.2	50.0	mg/kg dry	1	02/17/22 21:56	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 78 %	Limits: 50-150 %	1	02/17/22 21:56	NWTPH-Dx		
B3-S-5 (A2B0415-27)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.9	25.0	mg/kg dry	1	02/17/22 22:16	NWTPH-Dx	
Oil	203	23.9	50.0	mg/kg dry	1	02/17/22 22:16	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 79 %	Limits: 50-150 %	1	02/17/22 22:16	NWTPH-Dx		
B14-S-7 (A2B0415-29)				Matrix: Soil		Batch: 22B0653		
Diesel	ND	11.0	25.0	mg/kg dry	1	02/17/22 22:56	NWTPH-Dx	
Oil	ND	22.0	50.0	mg/kg dry	1	02/17/22 22:56	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 88 %	Limits: 50-150 %	1	02/17/22 22:56	NWTPH-Dx		
B14-S-9.5 (A2B0415-30)				Matrix: Soil		Batch: 22B0653		
Diesel	118	10.5	25.0	mg/kg dry	1	02/17/22 23:17	NWTPH-Dx	
Oil	32.9	20.9	50.0	mg/kg dry	1	02/17/22 23:17	NWTPH-Dx	J
Surrogate: o-Terphenyl (Surr)		Recovery: 83 %	Limits: 50-150 %	1	02/17/22 23:17	NWTPH-Dx		
NDU-S-0-5 (A2B0415-32)				Matrix: Soil		Batch: 22B0653		PRO
Diesel	ND	9.69	25.0	mg/kg dry	1	02/17/22 23:37	NWTPH-Dx	
Oil	203	19.4	50.0	mg/kg dry	1	02/17/22 23:37	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 86 %	Limits: 50-150 %	1	02/17/22 23:37	NWTPH-Dx		
NDU-S-5-10 (A2B0415-34)				Matrix: Soil		Batch: 22B0679		PRO
Diesel	19.3	10.3	25.0	mg/kg dry	1	02/17/22 22:02	NWTPH-Dx	J
Oil	82.0	20.5	50.0	mg/kg dry	1	02/17/22 22:02	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 85 %	Limits: 50-150 %	1	02/17/22 22:02	NWTPH-Dx		

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SDU-S-0-5 (A2B0415-36)				Matrix: Soil		Batch: 22B0679		PRO
Diesel	ND	9.57	25.0	mg/kg dry	1	02/17/22 22:45	NWTPH-Dx	J
Oil	26.7	19.1	50.0	mg/kg dry	1	02/17/22 22:45	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 70 %		Limits: 50-150 %	1	02/17/22 22:45	NWTPH-Dx	
SDU-S-5-10 (A2B0415-38)				Matrix: Soil		Batch: 22B0679		PRO
Diesel	ND	10.0	25.0	mg/kg dry	1	02/17/22 23:06	NWTPH-Dx	
Oil	ND	20.1	50.0	mg/kg dry	1	02/17/22 23:06	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recovery: 71 %		Limits: 50-150 %	1	02/17/22 23:06	NWTPH-Dx	

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6700 S.W. Sandburg Street

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Project Number: M0350.04.001

Project Manager: Emily Hess

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ANALYTICAL SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-11 (A2B0415-01)		Matrix: Soil			Batch: 22B0745			
Benzene	ND	4.83	9.66	ug/kg dry	50	02/21/22 17:15	5035A/8260D	
Toluene	ND	24.1	48.3	ug/kg dry	50	02/21/22 17:15	5035A/8260D	
Ethylbenzene	ND	12.1	24.1	ug/kg dry	50	02/21/22 17:15	5035A/8260D	
Xylenes, total	ND	36.2	72.4	ug/kg dry	50	02/21/22 17:15	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>105 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:15</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>96 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:15</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>102 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 17:15</i>	<i>5035A/8260D</i>
B6-S-21 (A2B0415-02)		Matrix: Soil			Batch: 22B0745			
Benzene	ND	5.57	11.1	ug/kg dry	50	02/21/22 17:42	5035A/8260D	
Toluene	ND	27.9	55.7	ug/kg dry	50	02/21/22 17:42	5035A/8260D	
Ethylbenzene	ND	13.9	27.9	ug/kg dry	50	02/21/22 17:42	5035A/8260D	
Xylenes, total	ND	41.8	83.6	ug/kg dry	50	02/21/22 17:42	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>105 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:42</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>99 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:42</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>101 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 17:42</i>	<i>5035A/8260D</i>
B6-S-31 (A2B0415-03)		Matrix: Soil			Batch: 22B0745			
Benzene	ND	5.84	11.7	ug/kg dry	50	02/21/22 18:09	5035A/8260D	
Toluene	ND	29.2	58.4	ug/kg dry	50	02/21/22 18:09	5035A/8260D	
Ethylbenzene	ND	14.6	29.2	ug/kg dry	50	02/21/22 18:09	5035A/8260D	
Xylenes, total	ND	43.8	87.5	ug/kg dry	50	02/21/22 18:09	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>106 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 18:09</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>97 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 18:09</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>103 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 18:09</i>	<i>5035A/8260D</i>
B6-S-41 (A2B0415-04)		Matrix: Soil			Batch: 22B0745			
Benzene	ND	7.74	15.5	ug/kg dry	50	02/21/22 18:36	5035A/8260D	
Toluene	ND	38.7	77.4	ug/kg dry	50	02/21/22 18:36	5035A/8260D	
Ethylbenzene	ND	19.3	38.7	ug/kg dry	50	02/21/22 18:36	5035A/8260D	
Xylenes, total	ND	58.0	116	ug/kg dry	50	02/21/22 18:36	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>106 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 18:36</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>96 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 18:36</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>103 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 18:36</i>	<i>5035A/8260D</i>

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-49.5 (A2B0415-05)		Matrix: Soil			Batch: 22B0745			
Benzene	ND	5.71	11.4	ug/kg dry	50	02/21/22 19:03	5035A/8260D	
Toluene	ND	28.5	57.1	ug/kg dry	50	02/21/22 19:03	5035A/8260D	
Ethylbenzene	ND	14.3	28.5	ug/kg dry	50	02/21/22 19:03	5035A/8260D	
Xylenes, total	ND	42.8	85.6	ug/kg dry	50	02/21/22 19:03	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>107 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 19:03</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>96 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 19:03</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>104 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 19:03</i>	<i>5035A/8260D</i>
B6-W-45 (A2B0415-06)		Matrix: Water			Batch: 22B0471			
Benzene	0.150	0.100	0.200	ug/L	1	02/12/22 17:47	EPA 8260D	J
Toluene	ND	0.500	1.00	ug/L	1	02/12/22 17:47	EPA 8260D	
Ethylbenzene	ND	0.250	0.500	ug/L	1	02/12/22 17:47	EPA 8260D	
Xylenes, total	ND	0.750	1.50	ug/L	1	02/12/22 17:47	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>114 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/12/22 17:47</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>95 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/12/22 17:47</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>100 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/12/22 17:47</i>	<i>EPA 8260D</i>
B6-W-45-DUP (A2B0415-07)		Matrix: Water			Batch: 22B0471			
Benzene	0.140	0.100	0.200	ug/L	1	02/12/22 18:14	EPA 8260D	J
Toluene	ND	0.500	1.00	ug/L	1	02/12/22 18:14	EPA 8260D	
Ethylbenzene	ND	0.250	0.500	ug/L	1	02/12/22 18:14	EPA 8260D	
Xylenes, total	ND	0.750	1.50	ug/L	1	02/12/22 18:14	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>116 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/12/22 18:14</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>95 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/12/22 18:14</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>103 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/12/22 18:14</i>	<i>EPA 8260D</i>
B7-S-11 (A2B0415-08)		Matrix: Soil			Batch: 22B0745			
Benzene	ND	5.52	11.0	ug/kg dry	50	02/21/22 19:30	5035A/8260D	
Toluene	ND	27.6	55.2	ug/kg dry	50	02/21/22 19:30	5035A/8260D	
Ethylbenzene	ND	13.8	27.6	ug/kg dry	50	02/21/22 19:30	5035A/8260D	
Xylenes, total	ND	41.4	82.8	ug/kg dry	50	02/21/22 19:30	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>107 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 19:30</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>95 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 19:30</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>103 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 19:30</i>	<i>5035A/8260D</i>

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-S-21 (A2B0415-09)		Matrix: Soil			Batch: 22B0745			
Benzene	ND	5.85	11.7	ug/kg dry	50	02/21/22 19:57	5035A/8260D	
Toluene	ND	29.2	58.5	ug/kg dry	50	02/21/22 19:57	5035A/8260D	
Ethylbenzene	ND	14.6	29.2	ug/kg dry	50	02/21/22 19:57	5035A/8260D	
Xylenes, total	ND	43.9	87.7	ug/kg dry	50	02/21/22 19:57	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>107 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 19:57</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>95 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 19:57</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>102 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 19:57</i>	<i>5035A/8260D</i>
B7-S-29.5 (A2B0415-10)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	5.00	9.99	ug/kg dry	50	02/21/22 15:37	5035A/8260D	
Toluene	ND	25.0	50.0	ug/kg dry	50	02/21/22 15:37	5035A/8260D	
Ethylbenzene	ND	12.5	25.0	ug/kg dry	50	02/21/22 15:37	5035A/8260D	
Xylenes, total	ND	37.5	75.0	ug/kg dry	50	02/21/22 15:37	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>100 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 15:37</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>99 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 15:37</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>99 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 15:37</i>	<i>5035A/8260D</i>
B7-S-35 (A2B0415-11)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	6.29	12.6	ug/kg dry	50	02/21/22 16:31	5035A/8260D	
Toluene	ND	31.5	62.9	ug/kg dry	50	02/21/22 16:31	5035A/8260D	
Ethylbenzene	ND	15.7	31.5	ug/kg dry	50	02/21/22 16:31	5035A/8260D	
Xylenes, total	ND	47.2	94.4	ug/kg dry	50	02/21/22 16:31	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>101 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 16:31</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>100 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 16:31</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>98 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 16:31</i>	<i>5035A/8260D</i>
B7-W-25 (A2B0415-12)		Matrix: Water			Batch: 22B0471			
Benzene	ND	0.100	0.200	ug/L	1	02/12/22 18:41	EPA 8260D	
Toluene	ND	0.500	1.00	ug/L	1	02/12/22 18:41	EPA 8260D	
Ethylbenzene	ND	0.250	0.500	ug/L	1	02/12/22 18:41	EPA 8260D	
Xylenes, total	ND	0.750	1.50	ug/L	1	02/12/22 18:41	EPA 8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>117 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/12/22 18:41</i>	<i>EPA 8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>95 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/12/22 18:41</i>	<i>EPA 8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>105 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/12/22 18:41</i>	<i>EPA 8260D</i>

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B2-S-6 (A2B0415-14)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	6.83	13.7	ug/kg dry	50	02/21/22 16:58	5035A/8260D	
Toluene	ND	34.2	68.3	ug/kg dry	50	02/21/22 16:58	5035A/8260D	
Ethylbenzene	ND	17.1	34.2	ug/kg dry	50	02/21/22 16:58	5035A/8260D	
Xylenes, total	ND	51.3	103	ug/kg dry	50	02/21/22 16:58	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>101 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 16:58</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>100 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 16:58</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>99 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 16:58</i>	<i>5035A/8260D</i>
B1-S-8.5 (A2B0415-18)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	6.89	13.8	ug/kg dry	50	02/21/22 17:25	5035A/8260D	
Toluene	ND	34.5	68.9	ug/kg dry	50	02/21/22 17:25	5035A/8260D	
Ethylbenzene	ND	17.2	34.5	ug/kg dry	50	02/21/22 17:25	5035A/8260D	
Xylenes, total	ND	51.7	103	ug/kg dry	50	02/21/22 17:25	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>102 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:25</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>98 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:25</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>99 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 17:25</i>	<i>5035A/8260D</i>
B4-S-8 (A2B0415-21)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	6.17	12.3	ug/kg dry	50	02/21/22 17:52	5035A/8260D	
Toluene	ND	30.8	61.7	ug/kg dry	50	02/21/22 17:52	5035A/8260D	
Ethylbenzene	ND	15.4	30.8	ug/kg dry	50	02/21/22 17:52	5035A/8260D	
Xylenes, total	ND	46.2	92.5	ug/kg dry	50	02/21/22 17:52	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>101 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:52</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>99 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 17:52</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>100 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 17:52</i>	<i>5035A/8260D</i>
B5-S-13.5 (A2B0415-25)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	7.04	14.1	ug/kg dry	50	02/21/22 18:19	5035A/8260D	
Toluene	ND	35.2	70.4	ug/kg dry	50	02/21/22 18:19	5035A/8260D	
Ethylbenzene	ND	17.6	35.2	ug/kg dry	50	02/21/22 18:19	5035A/8260D	
Xylenes, total	ND	52.8	106	ug/kg dry	50	02/21/22 18:19	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	<i>100 %</i>	<i>Limits:</i>	<i>80-120 %</i>	<i>1</i>	<i>02/21/22 18:19</i>	<i>5035A/8260D</i>
<i>Toluene-d8 (Surr)</i>			<i>98 %</i>		<i>80-120 %</i>	<i>1</i>	<i>02/21/22 18:19</i>	<i>5035A/8260D</i>
<i>4-Bromofluorobenzene (Surr)</i>			<i>98 %</i>		<i>79-120 %</i>	<i>1</i>	<i>02/21/22 18:19</i>	<i>5035A/8260D</i>

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B3-S-5 (A2B0415-27)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	7.02	14.0	ug/kg dry	50	02/21/22 18:46	5035A/8260D	
Toluene	ND	35.1	70.2	ug/kg dry	50	02/21/22 18:46	5035A/8260D	
Ethylbenzene	ND	17.6	35.1	ug/kg dry	50	02/21/22 18:46	5035A/8260D	
Xylenes, total	ND	52.7	105	ug/kg dry	50	02/21/22 18:46	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	98 %	<i>Limits:</i>	80-120 %	1	02/21/22 18:46	5035A/8260D
<i>Toluene-d8 (Surr)</i>			99 %		80-120 %	1	02/21/22 18:46	5035A/8260D
<i>4-Bromofluorobenzene (Surr)</i>			100 %		79-120 %	1	02/21/22 18:46	5035A/8260D
B14-S-7 (A2B0415-29)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	5.49	11.0	ug/kg dry	50	02/21/22 19:13	5035A/8260D	
Toluene	ND	27.4	54.9	ug/kg dry	50	02/21/22 19:13	5035A/8260D	
Ethylbenzene	ND	13.7	27.4	ug/kg dry	50	02/21/22 19:13	5035A/8260D	
Xylenes, total	ND	41.1	82.3	ug/kg dry	50	02/21/22 19:13	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	102 %	<i>Limits:</i>	80-120 %	1	02/21/22 19:13	5035A/8260D
<i>Toluene-d8 (Surr)</i>			98 %		80-120 %	1	02/21/22 19:13	5035A/8260D
<i>4-Bromofluorobenzene (Surr)</i>			97 %		79-120 %	1	02/21/22 19:13	5035A/8260D
B14-S-9.5 (A2B0415-30)		Matrix: Soil			Batch: 22B0751			
Benzene	ND	4.91	9.83	ug/kg dry	50	02/21/22 19:40	5035A/8260D	
Toluene	ND	24.6	49.1	ug/kg dry	50	02/21/22 19:40	5035A/8260D	
Ethylbenzene	ND	12.3	24.6	ug/kg dry	50	02/21/22 19:40	5035A/8260D	
Xylenes, total	ND	36.8	73.7	ug/kg dry	50	02/21/22 19:40	5035A/8260D	
<i>Surrogate: 1,4-Difluorobenzene (Surr)</i>		<i>Recovery:</i>	100 %	<i>Limits:</i>	80-120 %	1	02/21/22 19:40	5035A/8260D
<i>Toluene-d8 (Surr)</i>			99 %		80-120 %	1	02/21/22 19:40	5035A/8260D
<i>4-Bromofluorobenzene (Surr)</i>			98 %		79-120 %	1	02/21/22 19:40	5035A/8260D

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ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-11 (A2B0415-01)		Matrix: Soil		Batch: 22B0705		C-07		
Aroclor 1016	ND	5.58	11.2	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1221	ND	5.58	11.2	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1232	ND	5.58	11.2	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1242	ND	5.58	11.2	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1248	ND	5.58	11.2	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1254	ND	5.58	11.2	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1260	ND	5.58	11.2	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 74 %		Limits: 60-125 %	1	02/21/22 11:34	EPA 8082A	
B6-S-21 (A2B0415-02)		Matrix: Soil		Batch: 22B0705		C-07		
Aroclor 1016	ND	5.64	11.3	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1221	ND	5.64	11.3	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1232	ND	5.64	11.3	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1242	ND	5.64	11.3	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1248	ND	5.64	11.3	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1254	ND	5.64	11.3	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1260	ND	5.64	11.3	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 75 %		Limits: 60-125 %	1	02/21/22 12:09	EPA 8082A	
B6-S-31 (A2B0415-03)		Matrix: Soil		Batch: 22B0705		C-07		
Aroclor 1016	ND	5.91	11.8	ug/kg dry	1	02/21/22 09:13	EPA 8082A	
Aroclor 1221	ND	5.91	11.8	ug/kg dry	1	02/21/22 09:13	EPA 8082A	
Aroclor 1232	ND	5.91	11.8	ug/kg dry	1	02/21/22 09:13	EPA 8082A	
Aroclor 1242	ND	5.91	11.8	ug/kg dry	1	02/21/22 09:13	EPA 8082A	
Aroclor 1248	ND	5.91	11.8	ug/kg dry	1	02/21/22 09:13	EPA 8082A	
Aroclor 1254	ND	5.91	11.8	ug/kg dry	1	02/21/22 09:13	EPA 8082A	
Aroclor 1260	ND	5.91	11.8	ug/kg dry	1	02/21/22 09:13	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 81 %		Limits: 60-125 %	1	02/21/22 09:13	EPA 8082A	
B6-S-41 (A2B0415-04)		Matrix: Soil		Batch: 22B0705		C-07		
Aroclor 1016	ND	6.09	12.2	ug/kg dry	1	02/21/22 09:48	EPA 8082A	
Aroclor 1221	ND	6.09	12.2	ug/kg dry	1	02/21/22 09:48	EPA 8082A	
Aroclor 1232	ND	6.09	12.2	ug/kg dry	1	02/21/22 09:48	EPA 8082A	

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ANALYTICAL REPORT

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-41 (A2B0415-04)		Matrix: Soil			Batch: 22B0705		C-07	
Aroclor 1242	ND	6.09	12.2	ug/kg dry	1	02/21/22 09:48	EPA 8082A	
Aroclor 1248	ND	6.09	12.2	ug/kg dry	1	02/21/22 09:48	EPA 8082A	
Aroclor 1254	ND	6.09	12.2	ug/kg dry	1	02/21/22 09:48	EPA 8082A	
Aroclor 1260	ND	6.09	12.2	ug/kg dry	1	02/21/22 09:48	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 90 %		Limits: 60-125 %	1	02/21/22 09:48	EPA 8082A	
B6-S-49.5 (A2B0415-05)		Matrix: Soil			Batch: 22B0705		C-07	
Aroclor 1016	ND	5.89	11.8	ug/kg dry	1	02/21/22 10:23	EPA 8082A	
Aroclor 1221	ND	5.89	11.8	ug/kg dry	1	02/21/22 10:23	EPA 8082A	
Aroclor 1232	ND	5.89	11.8	ug/kg dry	1	02/21/22 10:23	EPA 8082A	
Aroclor 1242	ND	5.89	11.8	ug/kg dry	1	02/21/22 10:23	EPA 8082A	
Aroclor 1248	ND	5.89	11.8	ug/kg dry	1	02/21/22 10:23	EPA 8082A	
Aroclor 1254	ND	5.89	11.8	ug/kg dry	1	02/21/22 10:23	EPA 8082A	
Aroclor 1260	ND	5.89	11.8	ug/kg dry	1	02/21/22 10:23	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 79 %		Limits: 60-125 %	1	02/21/22 10:23	EPA 8082A	
B7-S-11 (A2B0415-08)		Matrix: Soil			Batch: 22B0705		C-07	
Aroclor 1016	ND	6.16	12.3	ug/kg dry	1	02/21/22 10:59	EPA 8082A	
Aroclor 1221	ND	6.16	12.3	ug/kg dry	1	02/21/22 10:59	EPA 8082A	
Aroclor 1232	ND	6.16	12.3	ug/kg dry	1	02/21/22 10:59	EPA 8082A	
Aroclor 1242	ND	6.16	12.3	ug/kg dry	1	02/21/22 10:59	EPA 8082A	
Aroclor 1248	ND	6.16	12.3	ug/kg dry	1	02/21/22 10:59	EPA 8082A	
Aroclor 1254	ND	6.16	12.3	ug/kg dry	1	02/21/22 10:59	EPA 8082A	
Aroclor 1260	ND	6.16	12.3	ug/kg dry	1	02/21/22 10:59	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 77 %		Limits: 60-125 %	1	02/21/22 10:59	EPA 8082A	
B7-S-21 (A2B0415-09)		Matrix: Soil			Batch: 22B0705		C-07	
Aroclor 1016	ND	5.94	11.9	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1221	ND	5.94	11.9	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1232	ND	5.94	11.9	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1242	ND	5.94	11.9	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1248	ND	5.94	11.9	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Aroclor 1254	ND	5.94	11.9	ug/kg dry	1	02/21/22 11:34	EPA 8082A	

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-S-21 (A2B0415-09)				Matrix: Soil		Batch: 22B0705		C-07
Aroclor 1260	ND	5.94	11.9	ug/kg dry	1	02/21/22 11:34	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)			Recovery: 79 %	Limits: 60-125 %	1	02/21/22 11:34	EPA 8082A	
B7-S-29.5 (A2B0415-10)				Matrix: Soil		Batch: 22B0705		C-07
Aroclor 1016	ND	5.89	11.8	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1221	ND	5.89	11.8	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1232	ND	5.89	11.8	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1242	ND	5.89	11.8	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1248	ND	5.89	11.8	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1254	ND	5.89	11.8	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Aroclor 1260	ND	5.89	11.8	ug/kg dry	1	02/21/22 12:09	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)			Recovery: 84 %	Limits: 60-125 %	1	02/21/22 12:09	EPA 8082A	
B7-S-35 (A2B0415-11RE2)				Matrix: Soil		Batch: 22B0931		C-07
Aroclor 1016	ND	6.22	12.4	ug/kg dry	1	02/25/22 16:15	EPA 8082A	
Aroclor 1221	ND	6.22	12.4	ug/kg dry	1	02/25/22 16:15	EPA 8082A	
Aroclor 1232	ND	6.22	12.4	ug/kg dry	1	02/25/22 16:15	EPA 8082A	
Aroclor 1242	ND	6.22	12.4	ug/kg dry	1	02/25/22 16:15	EPA 8082A	
Aroclor 1248	ND	6.22	12.4	ug/kg dry	1	02/25/22 16:15	EPA 8082A	
Aroclor 1254	ND	6.22	12.4	ug/kg dry	1	02/25/22 16:15	EPA 8082A	
Aroclor 1260	ND	6.22	12.4	ug/kg dry	1	02/25/22 16:15	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)			Recovery: 76 %	Limits: 60-125 %	1	02/25/22 16:15	EPA 8082A	
B14-S-7 (A2B0415-29)				Matrix: Soil		Batch: 22B0705		C-07
Aroclor 1016	ND	5.58	11.2	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1221	ND	5.58	11.2	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1232	ND	5.58	11.2	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1242	ND	5.58	11.2	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1248	ND	5.58	11.2	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1254	ND	5.58	11.2	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1260	ND	5.58	11.2	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)			Recovery: 84 %	Limits: 60-125 %	1	02/18/22 18:42	EPA 8082A	

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B14-S-9.5 (A2B0415-30)		Matrix: Soil		Batch: 22B0705		C-07		
Aroclor 1016	ND	5.35	10.7	ug/kg dry	1	02/18/22 16:22	EPA 8082A	
Aroclor 1221	ND	5.35	10.7	ug/kg dry	1	02/18/22 16:22	EPA 8082A	
Aroclor 1232	ND	5.35	10.7	ug/kg dry	1	02/18/22 16:22	EPA 8082A	
Aroclor 1242	ND	5.35	10.7	ug/kg dry	1	02/18/22 16:22	EPA 8082A	
Aroclor 1248	ND	5.35	10.7	ug/kg dry	1	02/18/22 16:22	EPA 8082A	
Aroclor 1254	ND	5.35	10.7	ug/kg dry	1	02/18/22 16:22	EPA 8082A	
Aroclor 1260	ND	5.35	10.7	ug/kg dry	1	02/18/22 16:22	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 98 %		Limits: 60-125 %	1	02/18/22 16:22	EPA 8082A	
NDU-S-0-5 (A2B0415-32)		Matrix: Soil		Batch: 22B0705		C-07, PRO		
Aroclor 1016	ND	5.05	10.1	ug/kg dry	1	02/18/22 16:57	EPA 8082A	
Aroclor 1221	ND	5.05	10.1	ug/kg dry	1	02/18/22 16:57	EPA 8082A	
Aroclor 1232	ND	5.05	10.1	ug/kg dry	1	02/18/22 16:57	EPA 8082A	
Aroclor 1242	ND	5.05	10.1	ug/kg dry	1	02/18/22 16:57	EPA 8082A	
Aroclor 1248	ND	5.05	10.1	ug/kg dry	1	02/18/22 16:57	EPA 8082A	
Aroclor 1254	ND	5.05	10.1	ug/kg dry	1	02/18/22 16:57	EPA 8082A	
Aroclor 1260	ND	5.05	10.1	ug/kg dry	1	02/18/22 16:57	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 96 %		Limits: 60-125 %	1	02/18/22 16:57	EPA 8082A	
NDU-S-5-10 (A2B0415-34)		Matrix: Soil		Batch: 22B0705		C-07, PRO		
Aroclor 1016	ND	5.10	10.2	ug/kg dry	1	02/18/22 17:32	EPA 8082A	
Aroclor 1221	ND	5.10	10.2	ug/kg dry	1	02/18/22 17:32	EPA 8082A	
Aroclor 1232	ND	5.10	10.2	ug/kg dry	1	02/18/22 17:32	EPA 8082A	
Aroclor 1242	ND	5.10	10.2	ug/kg dry	1	02/18/22 17:32	EPA 8082A	
Aroclor 1248	ND	5.10	10.2	ug/kg dry	1	02/18/22 17:32	EPA 8082A	
Aroclor 1254	ND	5.10	10.2	ug/kg dry	1	02/18/22 17:32	EPA 8082A	
Aroclor 1260	ND	5.10	10.2	ug/kg dry	1	02/18/22 17:32	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 100 %		Limits: 60-125 %	1	02/18/22 17:32	EPA 8082A	
SDU-S-0-5 (A2B0415-36)		Matrix: Soil		Batch: 22B0705		C-07, PRO		
Aroclor 1016	ND	5.03	10.1	ug/kg dry	1	02/18/22 18:07	EPA 8082A	
Aroclor 1221	ND	5.03	10.1	ug/kg dry	1	02/18/22 18:07	EPA 8082A	
Aroclor 1232	ND	5.03	10.1	ug/kg dry	1	02/18/22 18:07	EPA 8082A	

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SDU-S-0-5 (A2B0415-36)				Matrix: Soil		Batch: 22B0705		C-07, PRO
Aroclor 1242	ND	5.03	10.1	ug/kg dry	1	02/18/22 18:07	EPA 8082A	
Aroclor 1248	ND	5.03	10.1	ug/kg dry	1	02/18/22 18:07	EPA 8082A	
Aroclor 1254	ND	5.03	10.1	ug/kg dry	1	02/18/22 18:07	EPA 8082A	
Aroclor 1260	ND	5.03	10.1	ug/kg dry	1	02/18/22 18:07	EPA 8082A	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>		<i>Recovery: 101 %</i>		<i>Limits: 60-125 %</i>	<i>1</i>	<i>02/18/22 18:07</i>	<i>EPA 8082A</i>	
SDU-S-5-10 (A2B0415-38)				Matrix: Soil		Batch: 22B0705		C-07, PRO
Aroclor 1016	ND	5.01	10.0	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1221	ND	5.01	10.0	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1232	ND	5.01	10.0	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1242	ND	5.01	10.0	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1248	ND	5.01	10.0	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1254	ND	5.01	10.0	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
Aroclor 1260	ND	5.01	10.0	ug/kg dry	1	02/18/22 18:42	EPA 8082A	
<i>Surrogate: Decachlorobiphenyl (Surr)</i>		<i>Recovery: 100 %</i>		<i>Limits: 60-125 %</i>	<i>1</i>	<i>02/18/22 18:42</i>	<i>EPA 8082A</i>	

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Portland, OR 97232Project: POSC-Cascade Business ParkProject Number: **M0350.04.001**

Project Manager: Emily Hess

Report ID:**A2B0415 - 03 07 22 1212**

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls -- EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-W-45 (A2B0415-06)		Matrix: Water			Batch: 22B0747		C-07	
Aroclor 1016	ND	0.0260	0.0519	ug/L	1	02/21/22 18:32	EPA 8082A	
Aroclor 1221	ND	0.0519	0.0519	ug/L	1	02/21/22 18:32	EPA 8082A	
Aroclor 1232	ND	0.0260	0.0519	ug/L	1	02/21/22 18:32	EPA 8082A	
Aroclor 1242	ND	0.0260	0.0519	ug/L	1	02/21/22 18:32	EPA 8082A	
Aroclor 1248	ND	0.0260	0.0519	ug/L	1	02/21/22 18:32	EPA 8082A	
Aroclor 1254	ND	0.0260	0.0519	ug/L	1	02/21/22 18:32	EPA 8082A	
Aroclor 1260	ND	0.0260	0.0519	ug/L	1	02/21/22 18:32	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 47 %		Limits: 40-135 %	1	02/21/22 18:32	EPA 8082A	
B6-W-45-DUP (A2B0415-07)		Matrix: Water			Batch: 22B0747		C-07	
Aroclor 1016	ND	0.0250	0.0500	ug/L	1	02/21/22 18:49	EPA 8082A	
Aroclor 1221	ND	0.0250	0.0500	ug/L	1	02/21/22 18:49	EPA 8082A	
Aroclor 1232	ND	0.0250	0.0500	ug/L	1	02/21/22 18:49	EPA 8082A	
Aroclor 1242	ND	0.0250	0.0500	ug/L	1	02/21/22 18:49	EPA 8082A	
Aroclor 1248	ND	0.0250	0.0500	ug/L	1	02/21/22 18:49	EPA 8082A	
Aroclor 1254	ND	0.0250	0.0500	ug/L	1	02/21/22 18:49	EPA 8082A	
Aroclor 1260	ND	0.0250	0.0500	ug/L	1	02/21/22 18:49	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 48 %		Limits: 40-135 %	1	02/21/22 18:49	EPA 8082A	
B7-W-25 (A2B0415-12)		Matrix: Water			Batch: 22B0747		C-07	
Aroclor 1016	ND	0.0364	0.0727	ug/L	1	02/21/22 19:07	EPA 8082A	
Aroclor 1221	ND	0.0364	0.0727	ug/L	1	02/21/22 19:07	EPA 8082A	
Aroclor 1232	ND	0.0364	0.0727	ug/L	1	02/21/22 19:07	EPA 8082A	
Aroclor 1242	ND	0.0364	0.0727	ug/L	1	02/21/22 19:07	EPA 8082A	
Aroclor 1248	ND	0.0364	0.0727	ug/L	1	02/21/22 19:07	EPA 8082A	
Aroclor 1254	ND	0.0364	0.0727	ug/L	1	02/21/22 19:07	EPA 8082A	
Aroclor 1260	ND	0.0364	0.0727	ug/L	1	02/21/22 19:07	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		Recovery: 61 %		Limits: 40-135 %	1	02/21/22 19:07	EPA 8082A	

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Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-W-25 (A2B0415-12)		Matrix: Water			Batch: 22B0652			
Acenaphthene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Acenaphthylene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Anthracene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Benz(a)anthracene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Benzo(a)pyrene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Chrysene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Fluoranthene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Fluorene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
1-Methylnaphthalene	ND	0.0667	0.133	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
2-Methylnaphthalene	ND	0.0667	0.133	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Naphthalene	ND	0.0667	0.133	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Phenanthrene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Pyrene	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Dibenzofuran	ND	0.0333	0.0667	ug/L	1	02/17/22 18:14	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 77 %		Limits: 44-120 %	1	02/17/22 18:14	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		83 %		50-134 %	1	02/17/22 18:14	EPA 8270E SIM	

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ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-11 (A2B0415-01)				Matrix: Soil		Batch: 22B0814		
Acenaphthene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Acenaphthylene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Anthracene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Benz(a)anthracene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Benzo(a)pyrene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Chrysene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Fluoranthene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Fluorene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Naphthalene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Phenanthrene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Pyrene	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
Dibenzofuran	ND	5.30	10.6	ug/kg dry	1	02/22/22 17:39	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 61 %</i>		<i>Limits: 44-120 %</i>	<i>1</i>	<i>02/22/22 17:39</i>	<i>EPA 8270E SIM</i>	
<i>p-Terphenyl-d14 (Surr)</i>		<i>80 %</i>		<i>54-127 %</i>	<i>1</i>	<i>02/22/22 17:39</i>	<i>EPA 8270E SIM</i>	

B6-S-21 (A2B0415-02)**Matrix: Soil****Batch: 22B0659**

Acenaphthene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Acenaphthylene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Anthracene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Benz(a)anthracene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Benzo(a)pyrene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Benzo(b)fluoranthene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Benzo(k)fluoranthene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Benzo(g,h,i)perylene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Chrysene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM
Dibenz(a,h)anthracene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-21 (A2B0415-02)		Matrix: Soil			Batch: 22B0659			
Fluoranthene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
Fluorene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
Naphthalene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
Phenanthrene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
Pyrene	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
Dibenzofuran	ND	5.61	11.2	ug/kg dry	1	02/17/22 19:04	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 70 %		Limits: 44-120 %	1	02/17/22 19:04	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		77 %		54-127 %	1	02/17/22 19:04	EPA 8270E SIM	
B6-S-31 (A2B0415-03)		Matrix: Soil			Batch: 22B0659			
Acenaphthene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Acenaphthylene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Anthracene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Benz(a)anthracene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Benzo(a)pyrene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Chrysene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Fluoranthene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Fluorene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Naphthalene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Phenanthrene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Pyrene	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Dibenzofuran	ND	5.77	11.5	ug/kg dry	1	02/17/22 19:29	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 74 %		Limits: 44-120 %	1	02/17/22 19:29	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-31 (A2B0415-03)				Matrix: Soil		Batch: 22B0659		
<i>Surrogate: p-Terphenyl-d14 (Surr)</i>		<i>Recovery: 80 %</i>	<i>Limits: 54-127 %</i>	<i>1</i>	<i>02/17/22 19:29</i>	<i>EPA 8270E SIM</i>		
B6-S-41 (A2B0415-04)				Matrix: Soil		Batch: 22B0659		
Acenaphthene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Acenaphthylene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Anthracene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Benz(a)anthracene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Benzo(a)pyrene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Chrysene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Fluoranthene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Fluorene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
1-Methylnaphthalene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
2-Methylnaphthalene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Naphthalene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Phenanthrene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Pyrene	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
Dibenzofuran	ND	6.29	12.6	ug/kg dry	1	02/17/22 19:54	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 80 %</i>	<i>Limits: 44-120 %</i>	<i>1</i>	<i>02/17/22 19:54</i>	<i>EPA 8270E SIM</i>		
<i>p-Terphenyl-d14 (Surr)</i>		<i>95 %</i>	<i>54-127 %</i>	<i>1</i>	<i>02/17/22 19:54</i>	<i>EPA 8270E SIM</i>		
B6-S-49.5 (A2B0415-05)				Matrix: Soil		Batch: 22B0659		
Acenaphthene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Acenaphthylene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Anthracene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Benz(a)anthracene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Benzo(a)pyrene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-49.5 (A2B0415-05)		Matrix: Soil			Batch: 22B0659			
Chrysene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Fluoranthene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Fluorene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Naphthalene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Phenanthrene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Pyrene	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Dibenzofuran	ND	5.65	11.3	ug/kg dry	1	02/17/22 20:19	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 67 %		Limits: 44-120 %	1	02/17/22 20:19	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		68 %		54-127 %	1	02/17/22 20:19	EPA 8270E SIM	
B7-S-11 (A2B0415-08)		Matrix: Soil			Batch: 22B0659			
Acenaphthene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Acenaphthylene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Anthracene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Benz(a)anthracene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Benzo(a)pyrene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Chrysene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Fluoranthene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Fluorene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
1-Methylnaphthalene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
2-Methylnaphthalene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Naphthalene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Phenanthrene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Pyrene	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-S-11 (A2B0415-08)		Matrix: Soil			Batch: 22B0659			
Dibenzofuran	ND	6.23	12.5	ug/kg dry	1	02/18/22 10:22	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 78 %	Limits: 44-120 %	1	02/18/22 10:22	EPA 8270E SIM		
p-Terphenyl-d14 (Surr)		87 %	54-127 %	1	02/18/22 10:22	EPA 8270E SIM		
B7-S-21 (A2B0415-09)		Matrix: Soil			Batch: 22B0659			
Acenaphthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Acenaphthylene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Anthracene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Benz(a)anthracene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Benzo(a)pyrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Chrysene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Fluoranthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Fluorene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Naphthalene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Phenanthrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Pyrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Dibenzofuran	ND	5.83	11.7	ug/kg dry	1	02/18/22 10:47	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 54 %	Limits: 44-120 %	1	02/18/22 10:47	EPA 8270E SIM		
p-Terphenyl-d14 (Surr)		57 %	54-127 %	1	02/18/22 10:47	EPA 8270E SIM		
B7-S-29.5 (A2B0415-10)		Matrix: Soil			Batch: 22B0659			
Acenaphthene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Acenaphthylene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Anthracene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Benz(a)anthracene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Benzo(a)pyrene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-S-29.5 (A2B0415-10)				Matrix: Soil		Batch: 22B0659		
Benzo(k)fluoranthene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Chrysene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Fluoranthene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Fluorene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
1-Methylnaphthalene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
2-Methylnaphthalene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Naphthalene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Phenanthrene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Pyrene	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Dibenzofuran	ND	6.10	12.2	ug/kg dry	1	02/18/22 11:12	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 73 %		Limits: 44-120 %	1	02/18/22 11:12	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		75 %		54-127 %	1	02/18/22 11:12	EPA 8270E SIM	
B7-S-35 (A2B0415-11)				Matrix: Soil		Batch: 22B0659		
Acenaphthene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Acenaphthylene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Anthracene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Benz(a)anthracene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Benzo(a)pyrene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Chrysene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Fluoranthene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Fluorene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
1-Methylnaphthalene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
2-Methylnaphthalene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Naphthalene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-S-35 (A2B0415-11)				Matrix: Soil		Batch: 22B0659		
Phenanthrene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Pyrene	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Dibenzofuran	ND	6.46	12.9	ug/kg dry	1	02/18/22 11:37	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 70 %		Limits: 44-120 %	1	02/18/22 11:37	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		73 %		54-127 %	1	02/18/22 11:37	EPA 8270E SIM	
B2-S-6 (A2B0415-14)				Matrix: Soil		Batch: 22B0659		
Acenaphthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Acenaphthylene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Anthracene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Benz(a)anthracene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Benzo(a)pyrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Chrysene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Fluoranthene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Fluorene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Naphthalene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Phenanthrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Pyrene	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Dibenzofuran	ND	5.83	11.7	ug/kg dry	1	02/18/22 12:02	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 68 %		Limits: 44-120 %	1	02/18/22 12:02	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		78 %		54-127 %	1	02/18/22 12:02	EPA 8270E SIM	
B1-S-8.5 (A2B0415-18)				Matrix: Soil		Batch: 22B0659		
Acenaphthene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Acenaphthylene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Anthracene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Benz(a)anthracene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B1-S-8.5 (A2B0415-18)		Matrix: Soil			Batch: 22B0659			
Benzo(a)pyrene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Chrysene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Fluoranthene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Fluorene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Naphthalene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Phenanthrene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Pyrene	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Dibenzofuran	ND	5.78	11.6	ug/kg dry	1	02/18/22 12:27	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 81 %		Limits: 44-120 %	1	02/18/22 12:27	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		90 %		54-127 %	1	02/18/22 12:27	EPA 8270E SIM	
B4-S-8 (A2B0415-21)		Matrix: Soil			Batch: 22B0542			
Acenaphthene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Acenaphthylene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Anthracene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Benz(a)anthracene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Benzo(a)pyrene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Chrysene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Fluoranthene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Fluorene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B4-S-8 (A2B0415-21)		Matrix: Soil			Batch: 22B0542			
2-Methylnaphthalene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Naphthalene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Phenanthrene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Pyrene	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Dibenzofuran	ND	5.35	10.7	ug/kg dry	1	02/15/22 19:37	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 84 %		Limits: 44-120 %	1	02/15/22 19:37	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		93 %		54-127 %	1	02/15/22 19:37	EPA 8270E SIM	
B5-S-13.5 (A2B0415-25)		Matrix: Soil			Batch: 22B0542			
Acenaphthene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Acenaphthylene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Anthracene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Benz(a)anthracene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Benzo(a)pyrene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Chrysene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Fluoranthene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Fluorene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
1-Methylnaphthalene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
2-Methylnaphthalene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Naphthalene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Phenanthrene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Pyrene	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Dibenzofuran	ND	6.38	12.8	ug/kg dry	1	02/15/22 20:02	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 70 %		Limits: 44-120 %	1	02/15/22 20:02	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		74 %		54-127 %	1	02/15/22 20:02	EPA 8270E SIM	
B3-S-5 (A2B0415-27)		Matrix: Soil			Batch: 22B0542			
Acenaphthene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Acenaphthylene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B3-S-5 (A2B0415-27)		Matrix: Soil			Batch: 22B0542			
Anthracene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Benz(a)anthracene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Benzo(a)pyrene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Chrysene	ND	12.5	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Fluoranthene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Fluorene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
1-Methylnaphthalene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
2-Methylnaphthalene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Naphthalene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Phenanthrene	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
Pyrene	7.11	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	J
Dibenzofuran	ND	6.27	12.5	ug/kg dry	1	02/15/22 20:27	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 78 %</i>		<i>Limits: 44-120 %</i>	<i>1</i>	<i>02/15/22 20:27</i>	<i>EPA 8270E SIM</i>	
<i>p-Terphenyl-d14 (Surr)</i>		<i>84 %</i>		<i>54-127 %</i>	<i>1</i>	<i>02/15/22 20:27</i>	<i>EPA 8270E SIM</i>	

B14-S-7 (A2B0415-29)**Matrix: Soil****Batch: 22B0659**

Acenaphthene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Acenaphthylene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Anthracene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Benz(a)anthracene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Benzo(a)pyrene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Benzo(b)fluoranthene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Benzo(k)fluoranthene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Benzo(g,h,i)perylene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Chrysene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Dibenz(a,h)anthracene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Fluoranthene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM
Fluorene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B14-S-7 (A2B0415-29)		Matrix: Soil			Batch: 22B0659			
Indeno(1,2,3-cd)pyrene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM	
Naphthalene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM	
Phenanthrene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM	
Pyrene	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM	
Dibenzofuran	ND	5.77	11.5	ug/kg dry	1	02/18/22 12:52	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 92 %		Limits: 44-120 %	1	02/18/22 12:52	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		93 %		54-127 %	1	02/18/22 12:52	EPA 8270E SIM	
B14-S-9.5 (A2B0415-30)		Matrix: Soil			Batch: 22B0659			
Acenaphthene	ND	10.7	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Acenaphthylene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Anthracene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Benz(a)anthracene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Benzo(a)pyrene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Chrysene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Fluoranthene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Fluorene	28.0	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
1-Methylnaphthalene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
2-Methylnaphthalene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Naphthalene	ND	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Phenanthrene	37.8	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Pyrene	9.52	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	J
Dibenzofuran	14.3	5.37	10.7	ug/kg dry	1	02/18/22 13:17	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 74 %		Limits: 44-120 %	1	02/18/22 13:17	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		82 %		54-127 %	1	02/18/22 13:17	EPA 8270E SIM	
NDU-S-0-5 (A2B0415-32)		Matrix: Soil			Batch: 22B0659			PRO

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
NDU-S-0-5 (A2B0415-32)				Matrix: Soil		Batch: 22B0659		PRO
Acenaphthene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Acenaphthylene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Anthracene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Benz(a)anthracene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Benzo(a)pyrene	5.21	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	J
Benzo(b)fluoranthene	6.40	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	J
Benzo(k)fluoranthene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Benzo(g,h,i)perylene	7.31	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	J
Chrysene	7.08	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	J
Dibenz(a,h)anthracene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Fluoranthene	4.87	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	J
Fluorene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	5.73	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	J
1-Methylnaphthalene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
2-Methylnaphthalene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Naphthalene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Phenanthrene	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
Pyrene	6.22	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	J
Dibenzofuran	ND	4.76	9.52	ug/kg dry	1	02/18/22 14:08	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>		<i>Recovery: 72 %</i>		<i>Limits: 44-120 %</i>	<i>1</i>	<i>02/18/22 14:08</i>	<i>EPA 8270E SIM</i>	
<i>p-Terphenyl-d14 (Surr)</i>		<i>79 %</i>		<i>54-127 %</i>	<i>1</i>	<i>02/18/22 14:08</i>	<i>EPA 8270E SIM</i>	

NDU-S-5-10 (A2B0415-34)**Matrix: Soil****Batch: 22B0659****PRO**

Acenaphthene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Acenaphthylene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Anthracene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Benz(a)anthracene	ND	9.51	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Benzo(a)pyrene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Benzo(b)fluoranthene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Benzo(k)fluoranthene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Benzo(g,h,i)perylene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Chrysene	ND	9.51	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM
Dibenz(a,h)anthracene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
NDU-S-5-10 (A2B0415-34)				Matrix: Soil		Batch: 22B0659		PRO
Fluoranthene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
Fluorene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
1-Methylnaphthalene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
2-Methylnaphthalene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
Naphthalene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
Phenanthrene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
Pyrene	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
Dibenzofuran	ND	4.76	9.51	ug/kg dry	1	02/18/22 14:33	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>			Recovery: 77 %	Limits: 44-120 %	1	02/18/22 14:33	EPA 8270E SIM	
<i>p-Terphenyl-d14 (Surr)</i>			84 %	54-127 %	1	02/18/22 14:33	EPA 8270E SIM	
SDU-S-0-5 (A2B0415-36)				Matrix: Soil		Batch: 22B0659		PRO
Acenaphthene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Acenaphthylene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Anthracene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Benz(a)anthracene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Benzo(a)pyrene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Chrysene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Fluoranthene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Fluorene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
1-Methylnaphthalene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
2-Methylnaphthalene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Naphthalene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Phenanthrene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Pyrene	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
Dibenzofuran	ND	4.92	9.84	ug/kg dry	1	02/18/22 14:58	EPA 8270E SIM	
<i>Surrogate: 2-Fluorobiphenyl (Surr)</i>			Recovery: 74 %	Limits: 44-120 %	1	02/18/22 14:58	EPA 8270E SIM	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SDU-S-0-5 (A2B0415-36)				Matrix: Soil		Batch: 22B0659		PRO
Surrogate: p-Terphenyl-d14 (Surr)		Recovery: 84 %		Limits: 54-127 %	1	02/18/22 14:58	EPA 8270E SIM	
SDU-S-5-10 (A2B0415-38)				Matrix: Soil		Batch: 22B0659		PRO
Acenaphthene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Acenaphthylene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Anthracene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Benz(a)anthracene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Benzo(a)pyrene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Benzo(b)fluoranthene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Benzo(k)fluoranthene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Benzo(g,h,i)perylene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Chrysene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Dibenz(a,h)anthracene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Fluoranthene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Fluorene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Indeno(1,2,3-cd)pyrene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
1-Methylnaphthalene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
2-Methylnaphthalene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Naphthalene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Phenanthrene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Pyrene	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Dibenzofuran	ND	4.88	9.76	ug/kg dry	1	02/18/22 15:23	EPA 8270E SIM	
Surrogate: 2-Fluorobiphenyl (Surr)		Recovery: 75 %		Limits: 44-120 %	1	02/18/22 15:23	EPA 8270E SIM	
p-Terphenyl-d14 (Surr)		83 %		54-127 %	1	02/18/22 15:23	EPA 8270E SIM	

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Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-W-45 (A2B0415-06)		Matrix: Water			Batch: 22B0663			
Acenaphthene	ND	0.205	0.205	ug/L	1	02/17/22 15:21	EPA 8270E LVI	R-02
Acenaphthylene	ND	0.0400	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Anthracene	ND	0.0200	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Benz(a)anthracene	ND	0.0100	0.0200	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Benzo(a)pyrene	0.0105	0.0100	0.0200	ug/L	1	02/17/22 15:21	EPA 8270E LVI	J
Benzo(b)fluoranthene	0.0115	0.0100	0.0200	ug/L	1	02/17/22 15:21	EPA 8270E LVI	J
Benzo(k)fluoranthene	0.0125	0.0100	0.0200	ug/L	1	02/17/22 15:21	EPA 8270E LVI	J
Benzo(g,h,i)perylene	ND	0.0200	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Chrysene	0.0100	0.0100	0.0200	ug/L	1	02/17/22 15:21	EPA 8270E LVI	J
Dibenz(a,h)anthracene	ND	0.0100	0.0200	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Fluoranthene	ND	0.0200	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Fluorene	0.171	0.0200	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	0.0100	0.0200	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
1-Methylnaphthalene	1.40	0.0400	0.0801	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
2-Methylnaphthalene	1.66	0.0400	0.0801	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Naphthalene	0.641	0.0400	0.0801	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Phenanthrene	0.111	0.0400	0.0801	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Pyrene	ND	0.0200	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Carbazole	0.0871	0.0200	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
Dibenzofuran	0.0906	0.0200	0.0400	ug/L	1	02/17/22 15:21	EPA 8270E LVI	
<i>Surrogate: Acenaphthylene-d8 (Surr)</i>		<i>Recovery: 88 %</i>		<i>Limits: 78-134 %</i>	<i>1</i>	<i>02/17/22 15:21</i>	<i>EPA 8270E LVI</i>	
<i>Benzo(a)pyrene-d12 (Surr)</i>		<i>106 %</i>		<i>80-132 %</i>	<i>1</i>	<i>02/17/22 15:21</i>	<i>EPA 8270E LVI</i>	

B6-W-45-DUP (A2B0415-07)**Matrix: Water****Batch: 22B0663**

Acenaphthene	ND	0.277	0.277	ug/L	1	02/17/22 15:54	EPA 8270E LVI	R-02
Acenaphthylene	ND	0.0422	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Anthracene	ND	0.0422	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Benz(a)anthracene	ND	0.0106	0.0211	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Benzo(a)pyrene	ND	0.0106	0.0211	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	0.0106	0.0211	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	0.0106	0.0211	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	0.0211	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Chrysene	ND	0.0106	0.0211	ug/L	1	02/17/22 15:54	EPA 8270E LVI	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-W-45-DUP (A2B0415-07)		Matrix: Water			Batch: 22B0663			
Dibenz(a,h)anthracene	ND	0.0106	0.0211	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Fluoranthene	ND	0.0422	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Fluorene	0.222	0.0211	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	0.0106	0.0211	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
1-Methylnaphthalene	1.80	0.0422	0.0845	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
2-Methylnaphthalene	2.15	0.0422	0.0845	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Naphthalene	0.755	0.0422	0.0845	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Phenanthrene	0.165	0.0422	0.0845	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Pyrene	ND	0.0211	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Carbazole	0.0887	0.0211	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Dibenzofuran	0.118	0.0211	0.0422	ug/L	1	02/17/22 15:54	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 89 %		Limits: 78-134 %	1	02/17/22 15:54	EPA 8270E LVI	
Benzo(a)pyrene-d12 (Surr)		107 %		80-132 %	1	02/17/22 15:54	EPA 8270E LVI	

Apex Laboratories

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-11 (A2B0415-01)				Matrix: Soil				
Batch: 22B0611								
Arsenic	5.29	0.591	1.18	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
Barium	93.1	0.591	1.18	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
Cadmium	ND	0.118	0.236	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
Chromium	11.9	0.591	1.18	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
Lead	4.73	0.118	0.236	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
Mercury	ND	0.0473	0.0945	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
Selenium	ND	0.591	1.18	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
Silver	ND	0.118	0.236	mg/kg dry	10	02/18/22 02:47	EPA 6020B	
B6-S-21 (A2B0415-02)				Matrix: Soil				
Batch: 22B0611								
Arsenic	2.21	0.592	1.18	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
Barium	76.7	0.592	1.18	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
Cadmium	ND	0.118	0.237	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
Chromium	9.53	0.592	1.18	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
Lead	3.37	0.118	0.237	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
Mercury	ND	0.0474	0.0947	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
Selenium	ND	0.592	1.18	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
Silver	ND	0.118	0.237	mg/kg dry	10	02/18/22 03:11	EPA 6020B	
B6-S-31 (A2B0415-03)				Matrix: Soil				
Batch: 22B0611								
Arsenic	1.45	0.626	1.25	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
Barium	73.0	0.626	1.25	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
Cadmium	ND	0.125	0.250	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
Chromium	11.8	0.626	1.25	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
Lead	3.15	0.125	0.250	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
Mercury	ND	0.0501	0.100	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
Selenium	ND	0.626	1.25	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
Silver	ND	0.125	0.250	mg/kg dry	10	02/18/22 03:16	EPA 6020B	
B6-S-41 (A2B0415-04)				Matrix: Soil				
Batch: 22B0611								

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-41 (A2B0415-04)				Matrix: Soil				
Arsenic	4.23	0.628	1.26	mg/kg dry	10	02/18/22 03:21	EPA 6020B	J
Barium	101	0.628	1.26	mg/kg dry	10	02/18/22 03:21	EPA 6020B	
Cadmium	0.143	0.126	0.251	mg/kg dry	10	02/18/22 03:21	EPA 6020B	
Chromium	17.4	0.628	1.26	mg/kg dry	10	02/18/22 03:21	EPA 6020B	
Lead	7.17	0.126	0.251	mg/kg dry	10	02/18/22 03:21	EPA 6020B	
Mercury	ND	0.0502	0.100	mg/kg dry	10	02/18/22 03:21	EPA 6020B	
Selenium	ND	0.628	1.26	mg/kg dry	10	02/18/22 03:21	EPA 6020B	
Silver	ND	0.126	0.251	mg/kg dry	10	02/18/22 03:21	EPA 6020B	
B6-S-49.5 (A2B0415-05)				Matrix: Soil				
Batch: 22B0611								
Arsenic	3.87	0.624	1.25	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
Barium	92.3	0.624	1.25	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
Cadmium	ND	0.125	0.249	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
Chromium	10.8	0.624	1.25	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
Lead	4.38	0.125	0.249	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
Mercury	ND	0.0499	0.0998	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
Selenium	ND	0.624	1.25	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
Silver	ND	0.125	0.249	mg/kg dry	10	02/18/22 03:25	EPA 6020B	
B6-W-45 (A2B0415-06)				Matrix: Water				
Batch: 22B0563								
Arsenic	62.3	10.0	20.0	ug/L	20	02/17/22 02:44	EPA 6020B	R-04
Barium	1050	20.0	40.0	ug/L	20	02/17/22 02:44	EPA 6020B	
Cadmium	ND	2.00	4.00	ug/L	20	02/17/22 02:44	EPA 6020B	
Chromium	184	40.0	80.0	ug/L	20	02/17/22 02:44	EPA 6020B	
Lead	78.0	2.20	4.00	ug/L	20	02/17/22 02:44	EPA 6020B	
Mercury	ND	0.800	1.60	ug/L	20	02/17/22 02:44	EPA 6020B	
Silver	ND	2.00	4.00	ug/L	20	02/17/22 02:44	EPA 6020B	
B6-W-45 (A2B0415-06RE1)				Matrix: Water				
Batch: 22B0563								
Selenium	ND	10.0	20.0	ug/L	20	02/17/22 13:40	EPA 6020B	R-04

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Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-W-45-DUP (A2B0415-07) Matrix: Water								
Batch: 22B0563								
Arsenic	116	10.0	20.0	ug/L	20	02/17/22 02:53	EPA 6020B	Q-42
Barium	2340	20.0	40.0	ug/L	20	02/17/22 02:53	EPA 6020B	Q-42
Cadmium	2.29	2.00	4.00	ug/L	20	02/17/22 02:53	EPA 6020B	J, R-04
Chromium	430	40.0	80.0	ug/L	20	02/17/22 02:53	EPA 6020B	Q-42
Lead	186	2.20	4.00	ug/L	20	02/17/22 02:53	EPA 6020B	
Mercury	ND	0.800	1.60	ug/L	20	02/17/22 02:53	EPA 6020B	Q-42, R-04
Silver	ND	2.00	4.00	ug/L	20	02/17/22 02:53	EPA 6020B	
B6-W-45-DUP (A2B0415-07RE1) Matrix: Water								
Batch: 22B0563								
Selenium	ND	10.0	20.0	ug/L	20	02/17/22 14:05	EPA 6020B	R-04
B7-S-11 (A2B0415-08) Matrix: Soil								
Batch: 22B0611								
Arsenic	4.60	0.625	1.25	mg/kg dry	10	02/18/22 03:30	EPA 6020B	
Barium	101	0.625	1.25	mg/kg dry	10	02/18/22 03:30	EPA 6020B	
Cadmium	0.207	0.125	0.250	mg/kg dry	10	02/18/22 03:30	EPA 6020B	J
Chromium	15.8	0.625	1.25	mg/kg dry	10	02/18/22 03:30	EPA 6020B	
Lead	5.05	0.125	0.250	mg/kg dry	10	02/18/22 03:30	EPA 6020B	
Mercury	ND	0.0500	0.100	mg/kg dry	10	02/18/22 03:30	EPA 6020B	
Selenium	ND	0.625	1.25	mg/kg dry	10	02/18/22 03:30	EPA 6020B	
Silver	ND	0.125	0.250	mg/kg dry	10	02/18/22 03:30	EPA 6020B	
B7-S-21 (A2B0415-09) Matrix: Soil								
Batch: 22B0611								
Arsenic	4.07	0.609	1.22	mg/kg dry	10	02/18/22 03:35	EPA 6020B	
Barium	107	0.609	1.22	mg/kg dry	10	02/18/22 03:35	EPA 6020B	
Cadmium	ND	0.122	0.244	mg/kg dry	10	02/18/22 03:35	EPA 6020B	
Chromium	13.6	0.609	1.22	mg/kg dry	10	02/18/22 03:35	EPA 6020B	
Lead	5.60	0.122	0.244	mg/kg dry	10	02/18/22 03:35	EPA 6020B	
Mercury	ND	0.0487	0.0975	mg/kg dry	10	02/18/22 03:35	EPA 6020B	
Selenium	ND	0.609	1.22	mg/kg dry	10	02/18/22 03:35	EPA 6020B	
Silver	ND	0.122	0.244	mg/kg dry	10	02/18/22 03:35	EPA 6020B	

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-S-29.5 (A2B0415-10) Matrix: Soil								
Batch: 22B0611								
Arsenic	7.18	0.642	1.28	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
Barium	103	0.642	1.28	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
Cadmium	ND	0.128	0.257	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
Chromium	16.0	0.642	1.28	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
Lead	5.72	0.128	0.257	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
Mercury	ND	0.0514	0.103	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
Selenium	ND	0.642	1.28	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
Silver	ND	0.128	0.257	mg/kg dry	10	02/18/22 03:40	EPA 6020B	
B7-S-35 (A2B0415-11) Matrix: Soil								
Batch: 22B0611								
Arsenic	5.41	0.640	1.28	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
Barium	98.5	0.640	1.28	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
Cadmium	ND	0.128	0.256	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
Chromium	15.8	0.640	1.28	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
Lead	5.24	0.128	0.256	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
Mercury	ND	0.0512	0.102	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
Selenium	ND	0.640	1.28	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
Silver	ND	0.128	0.256	mg/kg dry	10	02/18/22 03:44	EPA 6020B	
B7-W-25 (A2B0415-12) Matrix: Water								
Batch: 22B0563								
Arsenic	160	10.0	20.0	ug/L	20	02/17/22 03:03	EPA 6020B	
Barium	1740	20.0	40.0	ug/L	20	02/17/22 03:03	EPA 6020B	
Cadmium	ND	2.00	4.00	ug/L	20	02/17/22 03:03	EPA 6020B	R-04
Chromium	370	40.0	80.0	ug/L	20	02/17/22 03:03	EPA 6020B	
Lead	190	2.20	4.00	ug/L	20	02/17/22 03:03	EPA 6020B	
Mercury	1.03	0.800	1.60	ug/L	20	02/17/22 03:03	EPA 6020B	J, R-04
Silver	ND	2.00	4.00	ug/L	20	02/17/22 03:03	EPA 6020B	R-04
B7-W-25 (A2B0415-12RE1) Matrix: Water								
Batch: 22B0563								
Selenium	13.2	10.0	20.0	ug/L	20	02/17/22 14:15	EPA 6020B	J, R-04

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B2-S-6 (A2B0415-14)				Matrix: Soil				
Batch: 22B0611								
Arsenic	7.64	0.651	1.30	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
Barium	46.7	0.651	1.30	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
Cadmium	ND	0.130	0.260	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
Chromium	18.8	0.651	1.30	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
Lead	5.10	0.130	0.260	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
Mercury	ND	0.0521	0.104	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
Selenium	ND	0.651	1.30	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
Silver	ND	0.130	0.260	mg/kg dry	10	02/18/22 03:49	EPA 6020B	
B1-S-8.5 (A2B0415-18)				Matrix: Soil				
Batch: 22B0611								
Arsenic	10.2	0.689	1.38	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
Barium	97.7	0.689	1.38	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
Cadmium	ND	0.138	0.276	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
Chromium	19.5	0.689	1.38	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
Lead	6.15	0.138	0.276	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
Mercury	ND	0.0551	0.110	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
Selenium	ND	0.689	1.38	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
Silver	ND	0.138	0.276	mg/kg dry	10	02/18/22 03:54	EPA 6020B	
B4-S-8 (A2B0415-21)				Matrix: Soil				
Batch: 22B0611								
Arsenic	27.3	0.547	1.09	mg/kg dry	10	02/18/22 04:08	EPA 6020B	
Barium	230	0.547	1.09	mg/kg dry	10	02/18/22 04:08	EPA 6020B	
Cadmium	ND	0.109	0.219	mg/kg dry	10	02/18/22 04:08	EPA 6020B	
Chromium	20.1	0.547	1.09	mg/kg dry	10	02/18/22 04:08	EPA 6020B	
Lead	5.38	0.109	0.219	mg/kg dry	10	02/18/22 04:08	EPA 6020B	
Mercury	ND	0.0437	0.0875	mg/kg dry	10	02/18/22 04:08	EPA 6020B	
Selenium	0.584	0.547	1.09	mg/kg dry	10	02/18/22 04:08	EPA 6020B	J
Silver	ND	0.109	0.219	mg/kg dry	10	02/18/22 04:08	EPA 6020B	
B5-S-13.5 (A2B0415-25)				Matrix: Soil				
Batch: 22B0722								

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B5-S-13.5 (A2B0415-25)				Matrix: Soil				
Arsenic	6.68	0.661	1.32	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
Barium	114	0.661	1.32	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
Cadmium	ND	0.132	0.264	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
Chromium	20.2	0.661	1.32	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
Lead	5.38	0.132	0.264	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
Mercury	ND	0.0529	0.106	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
Selenium	ND	0.661	1.32	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
Silver	ND	0.132	0.264	mg/kg dry	10	02/22/22 22:28	EPA 6020B	
B3-S-5 (A2B0415-27)				Matrix: Soil				
Batch: 22B0722								
Arsenic	23.1	0.685	1.37	mg/kg dry	10	02/22/22 22:44	EPA 6020B	
Barium	97.4	0.685	1.37	mg/kg dry	10	02/22/22 22:44	EPA 6020B	
Cadmium	ND	0.137	0.274	mg/kg dry	10	02/22/22 22:44	EPA 6020B	
Chromium	21.5	0.685	1.37	mg/kg dry	10	02/22/22 22:44	EPA 6020B	
Lead	9.69	0.137	0.274	mg/kg dry	10	02/22/22 22:44	EPA 6020B	
Mercury	0.0619	0.0548	0.110	mg/kg dry	10	02/22/22 22:44	EPA 6020B	J
Selenium	ND	0.685	1.37	mg/kg dry	10	02/22/22 22:44	EPA 6020B	
Silver	ND	0.137	0.274	mg/kg dry	10	02/22/22 22:44	EPA 6020B	
B14-S-7 (A2B0415-29)				Matrix: Soil				
Batch: 22B0722								
Arsenic	4.04	0.611	1.22	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
Barium	74.8	0.611	1.22	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
Cadmium	ND	0.122	0.245	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
Chromium	14.2	0.611	1.22	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
Lead	4.58	0.122	0.245	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
Mercury	ND	0.0489	0.0978	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
Selenium	ND	0.611	1.22	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
Silver	ND	0.122	0.245	mg/kg dry	10	02/22/22 22:49	EPA 6020B	
B14-S-9.5 (A2B0415-30)				Matrix: Soil				
Batch: 22B0802								
Arsenic	1.56	0.604	1.21	mg/kg dry	10	02/23/22 19:54	EPA 6020B	

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ANALYTICAL REPORT

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B14-S-9.5 (A2B0415-30)				Matrix: Soil				
Barium	73.3	0.604	1.21	mg/kg dry	10	02/23/22 19:54	EPA 6020B	
Cadmium	ND	0.121	0.242	mg/kg dry	10	02/23/22 19:54	EPA 6020B	
Chromium	12.0	0.604	1.21	mg/kg dry	10	02/23/22 19:54	EPA 6020B	
Lead	2.67	0.121	0.242	mg/kg dry	10	02/23/22 19:54	EPA 6020B	
Mercury	ND	0.0483	0.0966	mg/kg dry	10	02/23/22 19:54	EPA 6020B	
Selenium	ND	0.604	1.21	mg/kg dry	10	02/23/22 19:54	EPA 6020B	
Silver	ND	0.121	0.242	mg/kg dry	10	02/23/22 19:54	EPA 6020B	
NDU-S-0-5 (A2B0415-32)				Matrix: Soil				
Batch: 22B0722								
Arsenic	5.58	0.508	1.02	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO
Barium	122	0.508	1.02	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO
Cadmium	0.136	0.102	0.203	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO,J
Chromium	26.3	0.508	1.02	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO
Lead	10.2	0.102	0.203	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO
Mercury	ND	0.0406	0.0812	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO
Selenium	ND	0.508	1.02	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO
Silver	ND	0.102	0.203	mg/kg dry	10	02/22/22 22:54	EPA 6020B	PRO
NDU-S-5-10 (A2B0415-34)				Matrix: Soil				
Batch: 22B0722								
Arsenic	7.45	0.547	1.09	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO
Barium	111	0.547	1.09	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO
Cadmium	0.122	0.109	0.219	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO,J
Chromium	22.4	0.547	1.09	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO
Lead	6.96	0.109	0.219	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO
Mercury	ND	0.0438	0.0875	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO
Selenium	ND	0.547	1.09	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO
Silver	ND	0.109	0.219	mg/kg dry	10	02/22/22 22:59	EPA 6020B	PRO
SDU-S-0-5 (A2B0415-36)				Matrix: Soil				
Batch: 22B0722								
Arsenic	5.98	0.562	1.12	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO
Barium	117	0.562	1.12	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street
Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: **M0350.04.001**

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SDU-S-0-5 (A2B0415-36)				Matrix: Soil				
Cadmium	ND	0.112	0.225	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO
Chromium	18.8	0.562	1.12	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO
Lead	6.59	0.112	0.225	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO
Mercury	ND	0.0449	0.0899	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO
Selenium	ND	0.562	1.12	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO
Silver	ND	0.112	0.225	mg/kg dry	10	02/22/22 23:04	EPA 6020B	PRO
SDU-S-5-10 (A2B0415-38)				Matrix: Soil				
Batch: 22B0722								
Arsenic	4.83	0.542	1.08	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO
Barium	121	0.542	1.08	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO
Cadmium	ND	0.108	0.217	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO
Chromium	17.7	0.542	1.08	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO
Lead	5.68	0.108	0.217	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO
Mercury	ND	0.0433	0.0867	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO
Selenium	ND	0.542	1.08	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO
Silver	ND	0.108	0.217	mg/kg dry	10	02/22/22 23:09	EPA 6020B	PRO

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Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-W-45 (A2B0415-06RE1)		Matrix: Water						
Batch: 22B0772								
Arsenic	33.2	2.50	5.00	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	R-04
Barium	425	2.50	5.00	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	
Cadmium	ND	0.500	1.00	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	
Chromium	70.9	5.00	10.0	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	
Lead	35.0	0.500	1.00	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	
Mercury	ND	0.200	0.400	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	R-04
Selenium	2.70	2.50	5.00	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	J, R-04
Silver	ND	0.500	1.00	ug/L	5	02/24/22 18:16	EPA 6020B (Diss)	R-04
B6-W-45-DUP (A2B0415-07RE1)		Matrix: Water						
Batch: 22B0772								
Arsenic	32.1	2.50	5.00	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	R-04
Barium	286	2.50	5.00	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	
Cadmium	ND	0.500	1.00	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	
Chromium	51.2	5.00	10.0	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	
Lead	21.9	0.500	1.00	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	
Mercury	ND	0.200	0.400	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	R-04
Selenium	ND	2.50	5.00	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	R-04
Silver	ND	0.500	1.00	ug/L	5	02/24/22 18:26	EPA 6020B (Diss)	R-04
B7-W-25 (A2B0415-12RE1)		Matrix: Water						
Batch: 22B0772								
Arsenic	153	2.50	5.00	ug/L	5	02/24/22 18:36	EPA 6020B (Diss)	
Barium	1660	2.50	5.00	ug/L	5	02/24/22 18:36	EPA 6020B (Diss)	
Cadmium	1.82	0.500	1.00	ug/L	5	02/24/22 18:36	EPA 6020B (Diss)	
Chromium	371	5.00	10.0	ug/L	5	02/24/22 18:36	EPA 6020B (Diss)	
Lead	183	0.500	1.00	ug/L	5	02/24/22 18:36	EPA 6020B (Diss)	
Mercury	0.997	0.200	0.400	ug/L	5	02/24/22 18:36	EPA 6020B (Diss)	
Selenium	10.0	2.50	5.00	ug/L	5	02/24/22 18:36	EPA 6020B (Diss)	
B7-W-25 (A2B0415-12RE3)		Matrix: Water						
Batch: 22B0772								
Silver	1.58	0.500	1.00	ug/L	5	03/03/22 10:57	EPA 6020B (Diss)	

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ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062Maul Foster & Alongi, INC.3140 NE Broadway Street
Portland, OR 97232Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B6-S-11 (A2B0415-01)				Matrix: Soil		Batch: 22B0505		
% Solids	88.3	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B6-S-21 (A2B0415-02)				Matrix: Soil		Batch: 22B0505		
% Solids	85.7	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B6-S-31 (A2B0415-03)				Matrix: Soil		Batch: 22B0505		
% Solids	83.0	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B6-S-41 (A2B0415-04)				Matrix: Soil		Batch: 22B0505		
% Solids	79.3	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B6-S-49.5 (A2B0415-05)				Matrix: Soil		Batch: 22B0505		
% Solids	83.0	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B7-S-11 (A2B0415-08)				Matrix: Soil		Batch: 22B0505		
% Solids	79.5	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B7-S-21 (A2B0415-09)				Matrix: Soil		Batch: 22B0505		
% Solids	80.1	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B7-S-29.5 (A2B0415-10)				Matrix: Soil		Batch: 22B0505		
% Solids	81.5	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B7-S-35 (A2B0415-11)				Matrix: Soil		Batch: 22B0505		
% Solids	76.0	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B2-S-6 (A2B0415-14)				Matrix: Soil		Batch: 22B0505		
% Solids	82.3	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B1-S-8.5 (A2B0415-18)				Matrix: Soil		Batch: 22B0505		
% Solids	79.2	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B4-S-8 (A2B0415-21)				Matrix: Soil		Batch: 22B0505		
% Solids	88.1	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B5-S-13.5 (A2B0415-25)				Matrix: Soil		Batch: 22B0505		

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3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B5-S-13.5 (A2B0415-25)				Matrix: Soil		Batch: 22B0505		
% Solids	77.7	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B3-S-5 (A2B0415-27)				Matrix: Soil		Batch: 22B0505		
% Solids	78.3	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B14-S-7 (A2B0415-29)				Matrix: Soil		Batch: 22B0505		
% Solids	86.6	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
B14-S-9.5 (A2B0415-30)				Matrix: Soil		Batch: 22B0505		
% Solids	89.8	1.00	1.00	%	1	02/15/22 10:49	EPA 8000D	
NDU-S-0-5 (A2B0415-32)				Matrix: Soil		Batch: 22B0626		PRO
% Solids	96.8	1.00	1.00	%	1	02/17/22 08:23	EPA 8000D	
NDU-S-5-10 (A2B0415-34)				Matrix: Soil		Batch: 22B0626		PRO
% Solids	96.0	1.00	1.00	%	1	02/17/22 08:23	EPA 8000D	
SDU-S-0-5 (A2B0415-36)				Matrix: Soil		Batch: 22B0626		PRO
% Solids	96.8	1.00	1.00	%	1	02/17/22 08:23	EPA 8000D	
SDU-S-5-10 (A2B0415-38)				Matrix: Soil		Batch: 22B0626		PRO
% Solids	97.2	1.00	1.00	%	1	02/17/22 08:23	EPA 8000D	

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ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0534 - EPA 3510C (Fuels/Acid Ext.)						Water						
Blank (22B0534-BLK1)			Prepared: 02/15/22 07:06 Analyzed: 02/15/22 22:25									
NWTPH-Dx												
Diesel	ND	0.0909	0.182	mg/L	1	---	---	---	---	---	---	
Oil	ND	0.182	0.364	mg/L	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 92 %		Limits: 50-150 %		Dilution: 1x						
LCS (22B0534-BS1)			Prepared: 02/15/22 07:06 Analyzed: 02/15/22 22:45									
NWTPH-Dx												
Diesel	1.06	0.100	0.200	mg/L	1	1.25	---	85	36-132%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 90 %		Limits: 50-150 %		Dilution: 1x						
LCS Dup (22B0534-BSD1)			Prepared: 02/15/22 07:06 Analyzed: 02/15/22 23:05									Q-19
NWTPH-Dx												
Diesel	1.11	0.100	0.200	mg/L	1	1.25	---	89	36-132%	5	30%	
Surr: o-Terphenyl (Surr)		Recovery: 93 %		Limits: 50-150 %		Dilution: 1x						
Batch 22B0653 - EPA 3546 (Fuels)						Soil						
Blank (22B0653-BLK1)			Prepared: 02/17/22 07:18 Analyzed: 02/17/22 09:07									
NWTPH-Dx												
Diesel	ND	9.09	18.2	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	18.2	36.4	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 84 %		Limits: 50-150 %		Dilution: 1x						
LCS (22B0653-BS1)			Prepared: 02/17/22 07:18 Analyzed: 02/17/22 09:27									
NWTPH-Dx												
Diesel	114	10.0	20.0	mg/kg wet	1	125	---	91	38-132%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 86 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (22B0653-DUP1)			Prepared: 02/17/22 07:18 Analyzed: 02/17/22 10:08									
QC Source Sample: Non-SDG (A2B0592-01RE1)												
Diesel	ND	9.84	19.7	mg/kg wet	1	---	ND	---	---	---	30%	
Oil	ND	19.7	39.4	mg/kg wet	1	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		Recovery: 70 %		Limits: 50-150 %		Dilution: 1x						

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**ANALYTICAL REPORT****Apex Laboratories, LLC**

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

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3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212****QUALITY CONTROL (QC) SAMPLE RESULTS****Diesel and/or Oil Hydrocarbons by NWTPH-Dx**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0653 - EPA 3546 (Fuels)						Soil						
Duplicate (22B0653-DUP2)						Prepared: 02/17/22 10:13 Analyzed: 02/17/22 21:15						
QC Source Sample: B6-S-11 (A2B0415-01)												
NWTPH-Dx												
Diesel	ND	10.9	25.0	mg/kg dry	1	---	ND	---	---	---	30%	
Oil	ND	21.8	50.0	mg/kg dry	1	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		Recovery: 81 %		Limits: 50-150 %		Dilution: 1x						

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Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0679 - EPA 3546 (Fuels)						Soil						
Blank (22B0679-BLK1)			Prepared: 02/17/22 13:30 Analyzed: 02/17/22 20:37									
NWTPH-Dx												
Diesel	ND	9.09	25.0	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	18.2	50.0	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 92 %		Limits: 50-150 %		Dilution: 1x						
LCS (22B0679-BS1)			Prepared: 02/17/22 13:30 Analyzed: 02/17/22 20:58									
NWTPH-Dx												
Diesel	105	10.0	25.0	mg/kg wet	1	125	---	84	38-132%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 95 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (22B0679-DUP1)			Prepared: 02/17/22 13:30 Analyzed: 02/17/22 22:23						PRO			
QC Source Sample: NDU-S-5-10 (A2B0415-34)												
NWTPH-Dx												
Diesel	16.1	10.2	25.0	mg/kg dry	1	---	19.3	---	---	18	30%	J
Oil	86.5	20.4	50.0	mg/kg dry	1	---	82.0	---	---	5	30%	
Surr: o-Terphenyl (Surr)		Recovery: 79 %		Limits: 50-150 %		Dilution: 1x						
Duplicate (22B0679-DUP3)			Prepared: 02/17/22 13:30 Analyzed: 02/18/22 12:15									
QC Source Sample: Non-SDG (A2B0574-08RE1)												
Diesel	3430	62.9	126	mg/kg dry	5	---	5170	---	---	40	30%	Q-04
Oil	ND	126	252	mg/kg dry	5	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		Recovery: 86 %		Limits: 50-150 %		Dilution: 5x					S-05	

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Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0471 - EPA 5030B						Water						
Blank (22B0471-BLK1)			Prepared: 02/12/22 09:00 Analyzed: 02/12/22 14:40									
EPA 8260D												
Benzene	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Toluene	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Ethylbenzene	ND	0.250	0.500	ug/L	1	---	---	---	---	---	---	
Xylenes, total	ND	0.750	1.50	ug/L	1	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 112 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		96 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		102 %		80-120 %		"						
LCS (22B0471-BS1)			Prepared: 02/12/22 09:00 Analyzed: 02/12/22 13:40									
EPA 8260D												
Benzene	19.5	0.100	0.200	ug/L	1	20.0	---	98	80-120%	---	---	
Toluene	18.2	0.500	1.00	ug/L	1	20.0	---	91	80-120%	---	---	
Ethylbenzene	18.4	0.250	0.500	ug/L	1	20.0	---	92	80-120%	---	---	
Xylenes, total	53.5	0.750	1.50	ug/L	1	60.0	---	89	80-120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 110 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		95 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		99 %		80-120 %		"						
Duplicate (22B0471-DUP1)			Prepared: 02/12/22 13:52 Analyzed: 02/12/22 15:34									
QC Source Sample: Non-SDG (A2A1035-01)												
Benzene	ND	0.100	0.200	ug/L	1	---	ND	---	---	---	30%	
Toluene	ND	0.500	1.00	ug/L	1	---	ND	---	---	---	30%	
Ethylbenzene	ND	0.250	0.500	ug/L	1	---	ND	---	---	---	30%	
Xylenes, total	ND	0.750	1.50	ug/L	1	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 113 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		98 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		102 %		80-120 %		"						
Matrix Spike (22B0471-MS1)			Prepared: 02/12/22 13:52 Analyzed: 02/12/22 16:54									
QC Source Sample: Non-SDG (A2A1035-03)												
EPA 8260D												
Benzene	20.9	0.100	0.200	ug/L	1	20.0	ND	105	79-120%	---	---	

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**ANALYTICAL REPORT****Apex Laboratories, LLC**

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212****QUALITY CONTROL (QC) SAMPLE RESULTS****BTEX Compounds by EPA 8260D**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0471 - EPA 5030B						Water						
Matrix Spike (22B0471-MS1)			Prepared: 02/12/22 13:52 Analyzed: 02/12/22 16:54									
QC Source Sample: Non-SDG (A2A1035-03)												
Toluene	19.0	0.500	1.00	ug/L	1	20.0	ND	95	80-121%	---	---	
Ethylbenzene	19.4	0.250	0.500	ug/L	1	20.0	ND	97	79-121%	---	---	
Xylenes, total	55.8	0.750	1.50	ug/L	1	60.0	ND	93	79-121%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 111 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		94 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		98 %		80-120 %		"						

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QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0745 - EPA 5035A						Soil						
Blank (22B0745-BLK1)			Prepared: 02/20/22 09:00 Analyzed: 02/21/22 09:37									
5035A/8260D												
Benzene	ND	3.33	6.67	ug/kg wet	50	---	---	---	---	---	---	
Toluene	ND	16.7	33.3	ug/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	8.33	16.7	ug/kg wet	50	---	---	---	---	---	---	
Xylenes, total	ND	25.0	50.0	ug/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 109 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		93 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		103 %		79-120 %		"						
LCS (22B0745-BS1)			Prepared: 02/20/22 09:00 Analyzed: 02/21/22 08:43									
5035A/8260D												
Benzene	939	5.00	10.0	ug/kg wet	50	1000	---	94	80-120%	---	---	
Toluene	893	25.0	50.0	ug/kg wet	50	1000	---	89	80-120%	---	---	
Ethylbenzene	898	12.5	25.0	ug/kg wet	50	1000	---	90	80-120%	---	---	
Xylenes, total	2810	37.5	75.0	ug/kg wet	50	3000	---	94	80-120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 104 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		98 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		99 %		79-120 %		"						
Duplicate (22B0745-DUP1)			Prepared: 02/09/22 00:00 Analyzed: 02/21/22 14:34									
QC Source Sample: Non-SDG (A2B0345-13)												
Benzene	ND	6.93	13.9	ug/kg dry	50	---	ND	---	---	---	30%	
Toluene	ND	34.6	69.3	ug/kg dry	50	---	ND	---	---	---	30%	
Ethylbenzene	ND	17.3	34.6	ug/kg dry	50	---	ND	---	---	---	30%	
Xylenes, total	ND	52.0	104	ug/kg dry	50	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 108 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		96 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		102 %		79-120 %		"						
Matrix Spike (22B0745-MS1)			Prepared: 02/10/22 13:50 Analyzed: 02/21/22 20:24									
QC Source Sample: B7-S-21 (A2B0415-09)												
5035A/8260D												
Benzene	1210	5.85	11.7	ug/kg dry	50	1170	ND	104	77-121%	---	---	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0745 - EPA 5035A						Soil						
Matrix Spike (22B0745-MS1)			Prepared: 02/10/22 13:50 Analyzed: 02/21/22 20:24									
QC Source Sample: B7-S-21 (A2B0415-09)												
Toluene	1090	29.2	58.5	ug/kg dry	50	1170	ND	93	77-121%	---	---	
Ethylbenzene	1080	14.6	29.2	ug/kg dry	50	1170	ND	93	76-122%	---	---	
Xylenes, total	3430	43.9	87.7	ug/kg dry	50	3510	ND	98	78-124%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 106 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		96 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		101 %		79-120 %		"						

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QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0751 - EPA 5035A						Soil						
Blank (22B0751-BLK1)			Prepared: 02/21/22 08:00		Analyzed: 02/21/22 10:13							
5035A/8260D												
Benzene	ND	3.33	6.67	ug/kg wet	50	---	---	---	---	---	---	
Toluene	ND	16.7	33.3	ug/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	8.33	16.7	ug/kg wet	50	---	---	---	---	---	---	
Xylenes, total	ND	25.0	50.0	ug/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 100 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		95 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		101 %		79-120 %		"						

LCS (22B0751-BS1)				Prepared: 02/21/22 08:00 Analyzed: 02/21/22 08:43			
<u>5035A/8260D</u>							
Benzene	1090	5.00	10.0	ug/kg wet	50	1000	---
Toluene	1040	25.0	50.0	ug/kg wet	50	1000	---
Ethylbenzene	1080	12.5	25.0	ug/kg wet	50	1000	---
Xylenes, total	3200	37.5	75.0	ug/kg wet	50	3000	---
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 101 %		Limits: 80-120 %		Dilution: 1x	
Toluene-d8 (Surr)		102 %		80-120 %		"	
4-Bromofluorobenzene (Surr)		98 %		79-120 %		"	

Duplicate (22B0751-DUP1)				Prepared: 02/10/22 14:20 Analyzed: 02/21/22 16:04			
<u>QC Source Sample: B7-S-29.5 (A2B0415-10)</u>							
<u>5035A/8260D</u>							
Benzene	ND	6.95	13.9	ug/kg dry	50	---	ND
Toluene	ND	34.7	69.5	ug/kg dry	50	---	ND
Ethylbenzene	ND	17.4	34.7	ug/kg dry	50	---	ND
Xylenes, total	ND	52.1	104	ug/kg dry	50	---	ND
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 103 %		Limits: 80-120 %		Dilution: 1x	
Toluene-d8 (Surr)		99 %		80-120 %		"	
4-Bromofluorobenzene (Surr)		100 %		79-120 %		"	

Matrix Spike (22B0751-MS1)										Prepared: 02/10/22 11:45 Analyzed: 02/21/22 20:07									
<u>QC Source Sample: B14-S-9.5 (A2B0415-30)</u>																			
5035A/8260D																			

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Philip Nerenberg, Lab Director

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Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0751 - EPA 5035A						Soil						
Matrix Spike (22B0751-MS1)			Prepared: 02/10/22 11:45 Analyzed: 02/21/22 20:07									
QC Source Sample: B14-S-9.5 (A2B0415-30)												
Benzene	1080	4.91	9.83	ug/kg dry	50	984	ND	110	77-121%	---	---	
Toluene	1010	24.6	49.1	ug/kg dry	50	984	ND	103	77-121%	---	---	
Ethylbenzene	1040	12.3	24.6	ug/kg dry	50	984	ND	106	76-122%	---	---	
Xylenes, total	3090	36.8	73.7	ug/kg dry	50	2950	ND	105	78-124%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		Recovery: 100 %		Limits: 80-120 %		Dilution: 1x						
Toluene-d8 (Surr)		100 %		80-120 %		"						
4-Bromofluorobenzene (Surr)		97 %		79-120 %		"						

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QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0705 - EPA 3546												Soil
Blank (22B0705-BLK1)												C-07
Prepared: 02/18/22 07:39 Analyzed: 02/18/22 16:22												
<u>EPA 8082A</u>												
Aroclor 1016	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1232	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1242	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1248	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1254	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1260	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr) Recovery: 91 % Limits: 60-125 % Dilution: 1x												
LCS (22B0705-BS1)												C-07
Prepared: 02/18/22 07:39 Analyzed: 02/18/22 16:39												
<u>EPA 8082A</u>												
Aroclor 1016	198	5.00	10.0	ug/kg wet	1	250	---	79	47-134%	---	---	
Aroclor 1260	229	5.00	10.0	ug/kg wet	1	250	---	92	53-140%	---	---	
Surr: Decachlorobiphenyl (Surr) Recovery: 94 % Limits: 60-125 % Dilution: 1x												
Duplicate (22B0705-DUP1)												C-07
Prepared: 02/18/22 07:39 Analyzed: 02/18/22 17:32												
<u>QC Source Sample: Non-SDG (A2B0355-01)</u>												
Aroclor 1016	ND	5.67	11.3	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1221	ND	5.67	11.3	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1232	ND	5.67	11.3	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1242	ND	5.67	11.3	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1248	ND	5.67	11.3	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1254	ND	5.67	11.3	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1260	ND	5.67	11.3	ug/kg dry	1	---	ND	---	---	---	30%	
Surr: Decachlorobiphenyl (Surr) Recovery: 69 % Limits: 60-125 % Dilution: 1x												
Matrix Spike (22B0705-MS1)												C-07, PRO
Prepared: 02/18/22 07:39 Analyzed: 02/18/22 19:18												
<u>QC Source Sample: SDU-S-5-10 (A2B0415-38)</u>												
<u>EPA 8082A</u>												
Aroclor 1016	190	4.99	9.98	ug/kg dry	1	250	ND	76	47-134%	---	---	
Aroclor 1260	233	4.99	9.98	ug/kg dry	1	250	ND	93	53-140%	---	---	
Surr: Decachlorobiphenyl (Surr) Recovery: 101 % Limits: 60-125 % Dilution: 1x												

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0705 - EPA 3546							Soil					

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6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0815 - EPA 3546						Soil						
Blank (22B0815-BLK1)			Prepared: 02/22/22 12:55		Analyzed: 02/23/22 09:09		C-07					
EPA 8082A												
Aroclor 1016	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1232	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1242	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1248	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1254	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1260	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 91 %		Limits: 60-125 %		Dilution: 1x						
LCS (22B0815-BS1)			Prepared: 02/22/22 12:55		Analyzed: 02/23/22 09:27		C-07					
EPA 8082A												
Aroclor 1016	196	5.00	10.0	ug/kg wet	1	250	---	79	47-134%	---	---	
Aroclor 1260	222	5.00	10.0	ug/kg wet	1	250	---	89	53-140%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 82 %		Limits: 60-125 %		Dilution: 1x						
Duplicate (22B0815-DUP1)			Prepared: 02/22/22 12:55		Analyzed: 02/23/22 10:55		C-07					
QC Source Sample: B7-S-35 (A2B0415-I1RE1)												
EPA 8082A												
Aroclor 1016	ND	6.43	12.9	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1221	ND	6.43	12.9	ug/kg dry	1	---	26.2	---	---	***	30%	
Aroclor 1232	ND	6.43	12.9	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1242	ND	6.43	12.9	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1248	ND	6.43	12.9	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1254	ND	6.43	12.9	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1260	ND	6.43	12.9	ug/kg dry	1	---	ND	---	---	---	30%	
Surr: Decachlorobiphenyl (Surr)		Recovery: 73 %		Limits: 60-125 %		Dilution: 1x						
Matrix Spike (22B0815-MS1)			Prepared: 02/22/22 12:55		Analyzed: 02/23/22 11:30		C-07					
QC Source Sample: B7-S-35 (A2B0415-I1RE1)												
EPA 8082A												
Aroclor 1016	218	6.06	12.1	ug/kg dry	1	303	ND	72	47-134%	---	---	
Aroclor 1260	240	6.06	12.1	ug/kg drv	1	303	ND	79	53-140%	---	---	

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Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0815 - EPA 3546							Soil					
Matrix Spike (22B0815-MS1)			Prepared: 02/22/22 12:55 Analyzed: 02/23/22 11:30					C-07				
<u>QC Source Sample: B7-S-35 (A2B0415-11RE1)</u>												
Surr: Decachlorobiphenyl (Surr)				Recovery: 79 %		Limits: 60-125 %		Dilution: 1x				

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QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0931 - EPA 3546												
Soil												
Blank (22B0931-BLK1)			Prepared: 02/25/22 07:44		Analyzed: 02/25/22 15:39						C-07	
EPA 8082A												
Aroclor 1016	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1221	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1232	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1242	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1248	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1254	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Aroclor 1260	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 109 %		Limits: 60-125 %		Dilution: 1x						
LCS (22B0931-BS1)												
			Prepared: 02/25/22 07:44		Analyzed: 02/25/22 15:57						C-07	
EPA 8082A												
Aroclor 1016	205	5.00	10.0	ug/kg wet	1	250	---	82	47-134%	---	---	
Aroclor 1260	235	5.00	10.0	ug/kg wet	1	250	---	94	53-140%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 100 %		Limits: 60-125 %		Dilution: 1x						
Duplicate (22B0931-DUP1)												
			Prepared: 02/25/22 07:44		Analyzed: 02/25/22 16:52						C-07	
QC Source Sample: B7-S-35 (A2B0415-11RE2)												
EPA 8082A												
Aroclor 1016	ND	6.27	12.5	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1221	ND	6.27	12.5	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1232	ND	6.27	12.5	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1242	ND	6.27	12.5	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1248	ND	6.27	12.5	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1254	ND	6.27	12.5	ug/kg dry	1	---	ND	---	---	---	30%	
Aroclor 1260	ND	6.27	12.5	ug/kg dry	1	---	ND	---	---	---	30%	
Surr: Decachlorobiphenyl (Surr)		Recovery: 84 %		Limits: 60-125 %		Dilution: 1x						
Matrix Spike (22B0931-MS1)												
			Prepared: 02/25/22 07:44		Analyzed: 02/25/22 17:28						C-07	
QC Source Sample: B7-S-35 (A2B0415-11RE2)												
EPA 8082A												
Aroclor 1016	276	6.26	12.5	ug/kg dry	1	313	ND	88	47-134%	---	---	
Aroclor 1260	284	6.26	12.5	ug/kg dry	1	313	ND	91	53-140%	---	---	

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Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0931 - EPA 3546							Soil					
Matrix Spike (22B0931-MS1)			Prepared: 02/25/22 07:44 Analyzed: 02/25/22 17:28									C-07
<u>QC Source Sample: B7-S-35 (A2B0415-11RE2)</u>												
Surr: Decachlorobiphenyl (Surr)				Recovery: 94 %		Limits: 60-125 %		Dilution: 1x				

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls -- EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0747 - EPA 3510C (Neutral pH)						Water						
Blank (22B0747-BLK1)			Prepared: 02/21/22 06:56		Analyzed: 02/21/22 17:21		C-07					
EPA 8082A												
Aroclor 1016	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Aroclor 1221	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Aroclor 1232	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Aroclor 1242	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Aroclor 1248	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Aroclor 1254	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Aroclor 1260	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 52 %		Limits: 40-135 %		Dilution: 1x						
LCS (22B0747-BS1)			Prepared: 02/21/22 06:56		Analyzed: 02/21/22 17:39		C-07					
EPA 8082A												
Aroclor 1016	0.851	0.0100	0.0200	ug/L	1	1.25	---	68	46-129%	---	---	
Aroclor 1260	0.860	0.0100	0.0200	ug/L	1	1.25	---	69	45-134%	---	---	
Surr: Decachlorobiphenyl (Surr)		Recovery: 62 %		Limits: 40-135 %		Dilution: 1x						
LCS Dup (22B0747-BSD1)			Prepared: 02/21/22 06:56		Analyzed: 02/21/22 17:56		C-07, Q-19					
EPA 8082A												
Aroclor 1016	0.919	0.0100	0.0200	ug/L	1	1.25	---	74	46-129%	8	30%	
Aroclor 1260	0.931	0.0100	0.0200	ug/L	1	1.25	---	74	45-134%	8	30%	
Surr: Decachlorobiphenyl (Surr)		Recovery: 60 %		Limits: 40-135 %		Dilution: 1x						

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ORELAP ID: OR100062

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3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0652 - EPA 3510C (Acid Extraction)						Water						
Blank (22B0652-BLK3)			Prepared: 02/17/22 07:13 Analyzed: 02/18/22 13:43									
EPA 8270E SIM												
Acenaphthene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0182	0.0364	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0182	0.0364	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0182	0.0364	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.00909	0.0182	ug/L	1	---	---	---	---	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 77 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		90 %		50-134 %		"						

LCS (22B0652-BS1)

Prepared: 02/17/22 07:13 Analyzed: 02/17/22 12:04

EPA 8270E SIM												
Acenaphthene	2.96	0.0100	0.0200	ug/L	1	4.00	---	74	47-122%	---	---	
Acenaphthylene	3.02	0.0100	0.0200	ug/L	1	4.00	---	75	41-130%	---	---	
Anthracene	3.05	0.0100	0.0200	ug/L	1	4.00	---	76	57-123%	---	---	
Benz(a)anthracene	3.21	0.0100	0.0200	ug/L	1	4.00	---	80	58-125%	---	---	
Benzo(a)pyrene	3.29	0.0100	0.0200	ug/L	1	4.00	---	82	54-128%	---	---	
Benzo(b)fluoranthene	3.36	0.0100	0.0200	ug/L	1	4.00	---	84	53-131%	---	---	
Benzo(k)fluoranthene	3.35	0.0100	0.0200	ug/L	1	4.00	---	84	57-129%	---	---	
Benzo(g,h,i)perylene	3.13	0.0100	0.0200	ug/L	1	4.00	---	78	50-134%	---	---	
Chrysene	3.07	0.0100	0.0200	ug/L	1	4.00	---	77	59-123%	---	---	

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Philip Nerenberg, Lab Director



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Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0652 - EPA 3510C (Acid Extraction)						Water						
LCS (22B0652-BS1)			Prepared: 02/17/22 07:13		Analyzed: 02/17/22 12:04							
Dibenz(a,h)anthracene	3.45	0.0100	0.0200	ug/L	1	4.00	---	86	51-134%	---	---	
Fluoranthene	3.27	0.0100	0.0200	ug/L	1	4.00	---	82	57-128%	---	---	
Fluorene	3.00	0.0100	0.0200	ug/L	1	4.00	---	75	52-124%	---	---	
Indeno(1,2,3-cd)pyrene	3.06	0.0100	0.0200	ug/L	1	4.00	---	77	52-134%	---	---	
1-Methylnaphthalene	2.88	0.0200	0.0400	ug/L	1	4.00	---	72	41-120%	---	---	
2-Methylnaphthalene	2.71	0.0200	0.0400	ug/L	1	4.00	---	68	40-121%	---	---	
Naphthalene	2.80	0.0200	0.0400	ug/L	1	4.00	---	70	40-121%	---	---	
Phenanthrene	3.04	0.0100	0.0200	ug/L	1	4.00	---	76	59-120%	---	---	
Pyrene	3.24	0.0100	0.0200	ug/L	1	4.00	---	81	57-126%	---	---	
Dibenzofuran	3.00	0.0100	0.0200	ug/L	1	4.00	---	75	53-120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)												
		Recovery: 79 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		86 %		50-134 %		"						

LCS Dup (22B0652-BSD1)			Prepared: 02/17/22 07:13 Analyzed: 02/17/22 12:29							Q-19	
EPA 8270E SIM											
Acenaphthene	3.14	0.0100	0.0200	ug/L	1	4.00	---	79	47-122%	6	30%
Acenaphthylene	3.20	0.0100	0.0200	ug/L	1	4.00	---	80	41-130%	6	30%
Anthracene	3.25	0.0100	0.0200	ug/L	1	4.00	---	81	57-123%	6	30%
Benz(a)anthracene	3.38	0.0100	0.0200	ug/L	1	4.00	---	85	58-125%	5	30%
Benzo(a)pyrene	3.48	0.0100	0.0200	ug/L	1	4.00	---	87	54-128%	6	30%
Benzo(b)fluoranthene	3.52	0.0100	0.0200	ug/L	1	4.00	---	88	53-131%	5	30%
Benzo(k)fluoranthene	3.56	0.0100	0.0200	ug/L	1	4.00	---	89	57-129%	6	30%
Benzo(g,h,i)perylene	3.31	0.0100	0.0200	ug/L	1	4.00	---	83	50-134%	5	30%
Chrysene	3.27	0.0100	0.0200	ug/L	1	4.00	---	82	59-123%	6	30%
Dibenz(a,h)anthracene	3.63	0.0100	0.0200	ug/L	1	4.00	---	91	51-134%	5	30%
Fluoranthene	3.40	0.0100	0.0200	ug/L	1	4.00	---	85	57-128%	4	30%
Fluorene	3.21	0.0100	0.0200	ug/L	1	4.00	---	80	52-124%	6	30%
Indeno(1,2,3-cd)pyrene	3.21	0.0100	0.0200	ug/L	1	4.00	---	80	52-134%	5	30%
1-Methylnaphthalene	3.05	0.0200	0.0400	ug/L	1	4.00	---	76	41-120%	6	30%
2-Methylnaphthalene	2.87	0.0200	0.0400	ug/L	1	4.00	---	72	40-121%	6	30%
Naphthalene	2.91	0.0200	0.0400	ug/L	1	4.00	---	73	40-121%	4	30%
Phenanthrene	3.23	0.0100	0.0200	ug/L	1	4.00	---	81	59-120%	6	30%
Pyrene	3.35	0.0100	0.0200	ug/L	1	4.00	---	84	57-126%	3	30%
Dibenzofuran	3.17	0.0100	0.0200	ug/L	1	4.00	---	79	53-120%	5	30%

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Philip Nerenberg, Lab Director



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Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0652 - EPA 3510C (Acid Extraction)							Water					
LCS Dup (22B0652-BSD1)			Prepared: 02/17/22 07:13 Analyzed: 02/17/22 12:29								Q-19	
Surr: 2-Fluorobiphenyl (Surr)			Recovery: 79 %	Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)			85 %	50-134 %								

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Philip Nerenberg

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Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0542 - EPA 3546						Soil						
Blank (22B0542-BLK1)			Prepared: 02/15/22 08:00 Analyzed: 02/15/22 14:35									
EPA 8270E SIM												
Acenaphthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Anthracene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Chrysene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Fluoranthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Fluorene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Naphthalene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Phenanthrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Pyrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Dibenzofuran	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 86 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		102 %		54-127 %		"						

LCS (22B0542-BS1)

Prepared: 02/15/22 08:00 Analyzed: 02/15/22 15:00

EPA 8270E SIM												
Acenaphthene	659	5.00	10.0	ug/kg wet	1	800	---	82	40-123%	---	---	
Acenaphthylene	675	5.00	10.0	ug/kg wet	1	800	---	84	32-132%	---	---	
Anthracene	651	5.00	10.0	ug/kg wet	1	800	---	81	47-123%	---	---	
Benz(a)anthracene	660	5.00	10.0	ug/kg wet	1	800	---	83	49-126%	---	---	
Benzo(a)pyrene	684	5.00	10.0	ug/kg wet	1	800	---	85	45-129%	---	---	
Benzo(b)fluoranthene	741	5.00	10.0	ug/kg wet	1	800	---	93	45-132%	---	---	
Benzo(k)fluoranthene	718	5.00	10.0	ug/kg wet	1	800	---	90	47-132%	---	---	
Benzo(g,h,i)perylene	524	5.00	10.0	ug/kg wet	1	800	---	66	43-134%	---	---	
Chrysene	637	5.00	10.0	ug/kg wet	1	800	---	80	50-124%	---	---	

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Philip Nerenberg, Lab Director



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Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0542 - EPA 3546						Soil						
LCS (22B0542-BS1)			Prepared: 02/15/22 08:00		Analyzed: 02/15/22 15:00							
Dibenz(a,h)anthracene	665	5.00	10.0	ug/kg wet	1	800	---	83	45-134%	---	---	
Fluoranthene	663	5.00	10.0	ug/kg wet	1	800	---	83	50-127%	---	---	
Fluorene	647	5.00	10.0	ug/kg wet	1	800	---	81	43-125%	---	---	
Indeno(1,2,3-cd)pyrene	572	5.00	10.0	ug/kg wet	1	800	---	72	45-133%	---	---	
1-Methylnaphthalene	646	5.00	10.0	ug/kg wet	1	800	---	81	40-120%	---	---	
2-Methylnaphthalene	613	5.00	10.0	ug/kg wet	1	800	---	77	38-122%	---	---	
Naphthalene	627	5.00	10.0	ug/kg wet	1	800	---	78	35-123%	---	---	
Phenanthrene	645	5.00	10.0	ug/kg wet	1	800	---	81	50-121%	---	---	
Pyrene	666	5.00	10.0	ug/kg wet	1	800	---	83	47-127%	---	---	
Dibenzofuran	652	5.00	10.0	ug/kg wet	1	800	---	81	44-120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 90 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		97 %		54-127 %		"						

Duplicate (22B0542-DUP1)

Prepared: 02/15/22 08:00 Analyzed: 02/15/22 15:51

QC Source Sample: Non-SDG (A2B0445-06)

Acenaphthene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Acenaphthylene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Anthracene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Benz(a)anthracene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(a)pyrene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(b)fluoranthene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(k)fluoranthene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(g,h,i)perylene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Chrysene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Dibenz(a,h)anthracene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Fluoranthene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Fluorene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Indeno(1,2,3-cd)pyrene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
1-Methylnaphthalene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
2-Methylnaphthalene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Naphthalene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Phenanthrene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Pyrene	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%
Dibenzofuran	ND	6.08	12.2	ug/kg dry	1	---	ND	---	---	---	30%

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business ParkProject Number: **M0350.04.001**

Project Manager: Emily Hess

Report ID:**A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0542 - EPA 3546						Soil						
Duplicate (22B0542-DUP1)			Prepared: 02/15/22 08:00 Analyzed: 02/15/22 15:51									
QC Source Sample: Non-SDG (A2B0445-06)												
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 73 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		78 %		54-127 %		"						
Matrix Spike (22B0542-MS1)						Prepared: 02/15/22 08:00 Analyzed: 02/15/22 16:41						
QC Source Sample: Non-SDG (A2B0445-13)												
EPA 8270E SIM												
Acenaphthene	645	6.69	13.4	ug/kg dry	1	1070	ND	60	40-123%	---	---	
Acenaphthylene	640	6.69	13.4	ug/kg dry	1	1070	ND	60	32-132%	---	---	
Anthracene	726	6.69	13.4	ug/kg dry	1	1070	ND	68	47-123%	---	---	
Benz(a)anthracene	731	16.1	16.1	ug/kg dry	1	1070	ND	68	49-126%	---	---	
Benzo(a)pyrene	756	6.69	13.4	ug/kg dry	1	1070	ND	71	45-129%	---	---	
Benzo(b)fluoranthene	796	6.69	13.4	ug/kg dry	1	1070	11.8	73	45-132%	---	---	
Benzo(k)fluoranthene	839	6.69	13.4	ug/kg dry	1	1070	ND	78	47-132%	---	---	
Benzo(g,h,i)perylene	576	6.69	13.4	ug/kg dry	1	1070	14.3	52	43-134%	---	---	
Chrysene	720	16.1	16.1	ug/kg dry	1	1070	ND	67	50-124%	---	---	
Dibenz(a,h)anthracene	720	6.69	13.4	ug/kg dry	1	1070	ND	67	45-134%	---	---	
Fluoranthene	778	6.69	13.4	ug/kg dry	1	1070	ND	73	50-127%	---	---	
Fluorene	684	6.69	13.4	ug/kg dry	1	1070	ND	64	43-125%	---	---	
Indeno(1,2,3-cd)pyrene	622	6.69	13.4	ug/kg dry	1	1070	7.48	57	45-133%	---	---	
1-Methylnaphthalene	561	6.69	13.4	ug/kg dry	1	1070	ND	52	40-120%	---	---	
2-Methylnaphthalene	527	6.69	13.4	ug/kg dry	1	1070	ND	49	38-122%	---	---	
Naphthalene	518	6.69	13.4	ug/kg dry	1	1070	ND	48	35-123%	---	---	
Phenanthrene	735	6.69	13.4	ug/kg dry	1	1070	ND	69	50-121%	---	---	
Pyrene	786	6.69	13.4	ug/kg dry	1	1070	7.65	73	47-127%	---	---	
Dibenzofuran	662	6.69	13.4	ug/kg dry	1	1070	ND	62	44-120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 58 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		81 %		54-127 %		"						

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Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0659 - EPA 3546						Soil						
Blank (22B0659-BLK1)			Prepared: 02/17/22 10:06 Analyzed: 02/17/22 15:00									
EPA 8270E SIM												
Acenaphthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Anthracene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Chrysene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Fluoranthene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Fluorene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Naphthalene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Phenanthrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Pyrene	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Dibenzofuran	ND	4.55	9.09	ug/kg wet	1	---	---	---	---	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 92 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		106 %		54-127 %		"						

LCS (22B0659-BS1)

Prepared: 02/17/22 10:06 Analyzed: 02/17/22 15:25

EPA 8270E SIM												
Acenaphthene	684	5.00	10.0	ug/kg wet	1	800	---	86	40-123%	---	---	
Acenaphthylene	696	5.00	10.0	ug/kg wet	1	800	---	87	32-132%	---	---	
Anthracene	680	5.00	10.0	ug/kg wet	1	800	---	85	47-123%	---	---	
Benz(a)anthracene	680	5.00	10.0	ug/kg wet	1	800	---	85	49-126%	---	---	
Benzo(a)pyrene	704	5.00	10.0	ug/kg wet	1	800	---	88	45-129%	---	---	
Benzo(b)fluoranthene	705	5.00	10.0	ug/kg wet	1	800	---	88	45-132%	---	---	
Benzo(k)fluoranthene	741	5.00	10.0	ug/kg wet	1	800	---	93	47-132%	---	---	
Benzo(g,h,i)perylene	657	5.00	10.0	ug/kg wet	1	800	---	82	43-134%	---	---	
Chrysene	664	5.00	10.0	ug/kg wet	1	800	---	83	50-124%	---	---	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0659 - EPA 3546						Soil						
LCS (22B0659-BS1)				Prepared: 02/17/22 10:06		Analyzed: 02/17/22 15:25						
Dibenz(a,h)anthracene	728	5.00	10.0	ug/kg wet	1	800	---	91	45-134%	---	---	
Fluoranthene	701	5.00	10.0	ug/kg wet	1	800	---	88	50-127%	---	---	
Fluorene	678	5.00	10.0	ug/kg wet	1	800	---	85	43-125%	---	---	
Indeno(1,2,3-cd)pyrene	637	5.00	10.0	ug/kg wet	1	800	---	80	45-133%	---	---	
1-Methylnaphthalene	687	5.00	10.0	ug/kg wet	1	800	---	86	40-120%	---	---	
2-Methylnaphthalene	653	5.00	10.0	ug/kg wet	1	800	---	82	38-122%	---	---	
Naphthalene	667	5.00	10.0	ug/kg wet	1	800	---	83	35-123%	---	---	
Phenanthrene	677	5.00	10.0	ug/kg wet	1	800	---	85	50-121%	---	---	
Pyrene	698	5.00	10.0	ug/kg wet	1	800	---	87	47-127%	---	---	
Dibenzofuran	682	5.00	10.0	ug/kg wet	1	800	---	85	44-120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery:		90 %	Limits: 44-120 %		Dilution: 1x					
p-Terphenyl-d14 (Surr)				99 %	54-127 %		"					
Duplicate (22B0659-DUP1)						Prepared: 02/17/22 10:06		Analyzed: 02/17/22 16:15				
QC Source Sample: Non-SDG (A2B0528-01)												
Acenaphthene	ND	2610	2610	ug/kg dry	25	---	ND	---	---	---	30%	R-02
Acenaphthylene	ND	644	644	ug/kg dry	25	---	ND	---	---	---	30%	R-02
Anthracene	ND	828	828	ug/kg dry	25	---	ND	---	---	---	30%	R-02
Benz(a)anthracene	ND	307	307	ug/kg dry	25	---	ND	---	---	---	30%	
Benzo(a)pyrene	ND	153	307	ug/kg dry	25	---	ND	---	---	---	30%	
Benzo(b)fluoranthene	ND	153	307	ug/kg dry	25	---	ND	---	---	---	30%	
Benzo(k)fluoranthene	ND	153	307	ug/kg dry	25	---	ND	---	---	---	30%	
Benzo(g,h,i)perylene	ND	153	307	ug/kg dry	25	---	ND	---	---	---	30%	
Chrysene	ND	307	307	ug/kg dry	25	---	ND	---	---	---	30%	
Dibenz(a,h)anthracene	ND	153	307	ug/kg dry	25	---	ND	---	---	---	30%	
Fluoranthene	223	153	307	ug/kg dry	25	---	236	---	---	6	30%	J
Fluorene	6600	153	307	ug/kg dry	25	---	5800	---	---	13	30%	
Indeno(1,2,3-cd)pyrene	ND	153	307	ug/kg dry	25	---	ND	---	---	---	30%	
1-Methylnaphthalene	30100	153	307	ug/kg dry	25	---	30500	---	---	1	30%	
2-Methylnaphthalene	36300	153	307	ug/kg dry	25	---	38200	---	---	5	30%	
Naphthalene	3490	153	307	ug/kg dry	25	---	4430	---	---	24	30%	
Phenanthrene	11100	153	307	ug/kg dry	25	---	11000	---	---	0.9	30%	
Pyrene	1260	153	307	ug/kg dry	25	---	1260	---	---	0.2	30%	
Dibenzofuran	3020	153	307	ug/kg dry	25	---	2990	---	---	1	30%	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0659 - EPA 3546						Soil						
Duplicate (22B0659-DUP1)				Prepared: 02/17/22 10:06 Analyzed: 02/17/22 16:15								
QC Source Sample: Non-SDG (A2B0528-01)												
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 94 %		Limits: 44-120 %		Dilution: 25x						
p-Terphenyl-d14 (Surr)		93 %		54-127 %		"						
Matrix Spike (22B0659-MS1)				Prepared: 02/17/22 10:06 Analyzed: 02/17/22 17:24								
QC Source Sample: Non-SDG (A2B0546-03)												
EPA 8270E SIM												
Acenaphthene	971	86.3	86.3	ug/kg dry	3	920	ND	106	40-123%	---	---	Q-01
Acenaphthylene	783	34.5	34.5	ug/kg dry	3	920	ND	85	32-132%	---	---	
Anthracene	777	38.0	38.0	ug/kg dry	3	920	ND	85	47-123%	---	---	
Benz(a)anthracene	913	17.3	34.5	ug/kg dry	3	920	51.5	94	49-126%	---	---	
Benzo(a)pyrene	828	17.3	34.5	ug/kg dry	3	920	29.1	87	45-129%	---	---	
Benzo(b)fluoranthene	817	17.3	34.5	ug/kg dry	3	920	24.1	86	45-132%	---	---	
Benzo(k)fluoranthene	751	17.3	34.5	ug/kg dry	3	920	ND	82	47-132%	---	---	
Benzo(g,h,i)perylene	703	17.3	34.5	ug/kg dry	3	920	18.8	74	43-134%	---	---	
Chrysene	880	17.3	34.5	ug/kg dry	3	920	78.7	87	50-124%	---	---	
Dibenz(a,h)anthracene	718	17.3	34.5	ug/kg dry	3	920	ND	78	45-134%	---	---	
Fluoranthene	1050	17.3	34.5	ug/kg dry	3	920	77.7	106	50-127%	---	---	
Fluorene	783	17.3	34.5	ug/kg dry	3	920	ND	85	43-125%	---	---	
Indeno(1,2,3-cd)pyrene	681	17.3	34.5	ug/kg dry	3	920	ND	74	45-133%	---	---	
1-Methylnaphthalene	759	34.5	34.5	ug/kg dry	3	920	ND	82	40-120%	---	---	
2-Methylnaphthalene	740	17.3	34.5	ug/kg dry	3	920	ND	80	38-122%	---	---	
Naphthalene	829	34.5	34.5	ug/kg dry	3	920	ND	90	35-123%	---	---	
Phenanthrene	758	34.5	34.5	ug/kg dry	3	920	ND	82	50-121%	---	---	
Pyrene	1660	17.3	34.5	ug/kg dry	3	920	204	159	47-127%	---	---	
Dibenzofuran	738	34.5	34.5	ug/kg dry	3	920	ND	80	44-120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 81 %		Limits: 44-120 %		Dilution: 3x						
p-Terphenyl-d14 (Surr)		88 %		54-127 %		"						

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0814 - EPA 3546						Soil						
Blank (22B0814-BLK1)			Prepared: 02/22/22 12:52 Analyzed: 02/22/22 16:49									
EPA 8270E SIM												
Acenaphthene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Acenaphthylene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Anthracene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Chrysene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Fluoranthene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Fluorene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Naphthalene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Phenanthrene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Pyrene	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Dibenzofuran	ND	1.25	2.50	ug/kg wet	1	---	---	---	---	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 90 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		104 %		54-127 %		"						

LCS (22B0814-BS1)

Prepared: 02/22/22 12:52 Analyzed: 02/22/22 17:14

EPA 8270E SIM												
Acenaphthene	441	1.33	2.67	ug/kg wet	1	533	---	83	40-123%	---	---	
Acenaphthylene	451	1.33	2.67	ug/kg wet	1	533	---	85	32-132%	---	---	
Anthracene	461	1.33	2.67	ug/kg wet	1	533	---	86	47-123%	---	---	
Benz(a)anthracene	497	1.33	2.67	ug/kg wet	1	533	---	93	49-126%	---	---	
Benzo(a)pyrene	511	1.33	2.67	ug/kg wet	1	533	---	96	45-129%	---	---	
Benzo(b)fluoranthene	505	1.33	2.67	ug/kg wet	1	533	---	95	45-132%	---	---	
Benzo(k)fluoranthene	527	1.33	2.67	ug/kg wet	1	533	---	99	47-132%	---	---	
Benzo(g,h,i)perylene	471	1.33	2.67	ug/kg wet	1	533	---	88	43-134%	---	---	
Chrysene	472	1.33	2.67	ug/kg wet	1	533	---	89	50-124%	---	---	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business ParkProject Number: **M0350.04.001**

Project Manager: Emily Hess

Report ID:**A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0814 - EPA 3546						Soil						
LCS (22B0814-BS1)			Prepared: 02/22/22 12:52		Analyzed: 02/22/22 17:14							
Dibenz(a,h)anthracene	535	1.33	2.67	ug/kg wet	1	533	---	100	45-134%	---	---	
Fluoranthene	480	1.33	2.67	ug/kg wet	1	533	---	90	50-127%	---	---	
Fluorene	439	1.33	2.67	ug/kg wet	1	533	---	82	43-125%	---	---	
Indeno(1,2,3-cd)pyrene	472	1.33	2.67	ug/kg wet	1	533	---	88	45-133%	---	---	
1-Methylnaphthalene	413	1.33	2.67	ug/kg wet	1	533	---	77	40-120%	---	---	
2-Methylnaphthalene	398	1.33	2.67	ug/kg wet	1	533	---	75	38-122%	---	---	
Naphthalene	405	1.33	2.67	ug/kg wet	1	533	---	76	35-123%	---	---	
Phenanthrene	453	1.33	2.67	ug/kg wet	1	533	---	85	50-121%	---	---	
Pyrene	471	1.33	2.67	ug/kg wet	1	533	---	88	47-127%	---	---	
Dibenzofuran	436	1.33	2.67	ug/kg wet	1	533	---	82	44-120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 82 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		101 %		54-127 %		"						

Duplicate (22B0814-DUP1)

Prepared: 02/22/22 12:52 Analyzed: 02/22/22 18:04

QC Source Sample: B6-S-11 (A2B0415-01)EPA 8270E SIM

Acenaphthene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Acenaphthylene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Anthracene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Benz(a)anthracene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(a)pyrene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(b)fluoranthene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(k)fluoranthene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Benzo(g,h,i)perylene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Chrysene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Dibenz(a,h)anthracene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Fluoranthene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Fluorene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Indeno(1,2,3-cd)pyrene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
1-Methylnaphthalene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
2-Methylnaphthalene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Naphthalene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Phenanthrene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%
Pyrene	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0814 - EPA 3546						Soil						
Duplicate (22B0814-DUP1)			Prepared: 02/22/22 12:52 Analyzed: 02/22/22 18:04									
QC Source Sample: B6-S-11 (A2B0415-01)												
Dibenzofuran	ND	5.26	10.5	ug/kg dry	1	---	ND	---	---	---	30%	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 73 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		82 %		54-127 %		"						
Matrix Spike (22B0814-MS1)			Prepared: 02/22/22 12:52 Analyzed: 02/22/22 18:29									
QC Source Sample: B6-S-11 (A2B0415-01)												
EPA 8270E SIM												
Acenaphthene	674	5.27	10.5	ug/kg dry	1	842	ND	80	40-123%	---	---	
Acenaphthylene	685	5.27	10.5	ug/kg dry	1	842	ND	81	32-132%	---	---	
Anthracene	704	5.27	10.5	ug/kg dry	1	842	ND	84	47-123%	---	---	
Benz(a)anthracene	719	5.27	10.5	ug/kg dry	1	842	ND	85	49-126%	---	---	
Benzo(a)pyrene	737	5.27	10.5	ug/kg dry	1	842	ND	87	45-129%	---	---	
Benzo(b)fluoranthene	773	5.27	10.5	ug/kg dry	1	842	ND	92	45-132%	---	---	
Benzo(k)fluoranthene	773	5.27	10.5	ug/kg dry	1	842	ND	92	47-132%	---	---	
Benzo(g,h,i)perylene	666	5.27	10.5	ug/kg dry	1	842	ND	79	43-134%	---	---	
Chrysene	701	5.27	10.5	ug/kg dry	1	842	ND	83	50-124%	---	---	
Dibenz(a,h)anthracene	764	5.27	10.5	ug/kg dry	1	842	ND	91	45-134%	---	---	
Fluoranthene	728	5.27	10.5	ug/kg dry	1	842	ND	86	50-127%	---	---	
Fluorene	674	5.27	10.5	ug/kg dry	1	842	ND	80	43-125%	---	---	
Indeno(1,2,3-cd)pyrene	673	5.27	10.5	ug/kg dry	1	842	ND	80	45-133%	---	---	
1-Methylnaphthalene	627	5.27	10.5	ug/kg dry	1	842	ND	74	40-120%	---	---	
2-Methylnaphthalene	594	5.27	10.5	ug/kg dry	1	842	ND	71	38-122%	---	---	
Naphthalene	608	5.27	10.5	ug/kg dry	1	842	ND	72	35-123%	---	---	
Phenanthrene	688	5.27	10.5	ug/kg dry	1	842	ND	82	50-121%	---	---	
Pyrene	717	5.27	10.5	ug/kg dry	1	842	ND	85	47-127%	---	---	
Dibenzofuran	673	5.27	10.5	ug/kg dry	1	842	ND	80	44-120%	---	---	
Surr: 2-Fluorobiphenyl (Surr)		Recovery: 78 %		Limits: 44-120 %		Dilution: 1x						
p-Terphenyl-d14 (Surr)		95 %		54-127 %		"						

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Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0663 - EPA 3511 (Bottle Extraction)						Water						
Blank (22B0663-BLK1)			Prepared: 02/17/22 10:29		Analyzed: 02/17/22 13:44							
EPA 8270E LVI												
Acenaphthene	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00794	0.0159	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00794	0.0159	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00794	0.0159	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00794	0.0159	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00794	0.0159	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00794	0.0159	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00794	0.0159	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0317	0.0635	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0317	0.0635	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0317	0.0635	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.0317	0.0635	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.0159	0.0317	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 83 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		92 %		80-132 %		"						

LCS (22B0663-BS1)

Prepared: 02/17/22 10:29 Analyzed: 02/17/22 14:16

EPA 8270E LVI												
Acenaphthene	1.51	0.0160	0.0320	ug/L	1	1.60	---	94	80-120%	---	---	
Acenaphthylene	1.64	0.0160	0.0320	ug/L	1	1.60	---	103	80-124%	---	---	
Anthracene	1.51	0.0160	0.0320	ug/L	1	1.60	---	95	80-123%	---	---	
Benz(a)anthracene	1.45	0.00800	0.0160	ug/L	1	1.60	---	90	80-122%	---	---	
Benzo(a)pyrene	1.59	0.00800	0.0160	ug/L	1	1.60	---	100	80-129%	---	---	
Benzo(b)fluoranthene	1.57	0.00800	0.0160	ug/L	1	1.60	---	98	80-124%	---	---	
Benzo(k)fluoranthene	1.54	0.00800	0.0160	ug/L	1	1.60	---	97	80-125%	---	---	
Benzo(g,h,i)perylene	1.54	0.0160	0.0320	ug/L	1	1.60	---	96	80-120%	---	---	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0663 - EPA 3511 (Bottle Extraction)						Water						
LCS (22B0663-BS1)			Prepared: 02/17/22 10:29		Analyzed: 02/17/22 14:16							
Chrysene	1.52	0.00800	0.0160	ug/L	1	1.60	---	95	80-120%	---	---	
Dibenz(a,h)anthracene	1.56	0.00800	0.0160	ug/L	1	1.60	---	97	80-120%	---	---	
Fluoranthene	1.66	0.0160	0.0320	ug/L	1	1.60	---	104	80-126%	---	---	
Fluorene	1.63	0.0160	0.0320	ug/L	1	1.60	---	102	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.45	0.00800	0.0160	ug/L	1	1.60	---	91	80-121%	---	---	
1-Methylnaphthalene	1.63	0.0320	0.0640	ug/L	1	1.60	---	102	53-148%	---	---	
2-Methylnaphthalene	1.57	0.0320	0.0640	ug/L	1	1.60	---	98	48-150%	---	---	
Naphthalene	1.51	0.0320	0.0640	ug/L	1	1.60	---	94	78-120%	---	---	
Phenanthrene	1.48	0.0320	0.0640	ug/L	1	1.60	---	93	80-120%	---	---	
Pyrene	1.66	0.0160	0.0320	ug/L	1	1.60	---	104	80-125%	---	---	
Carbazole	1.53	0.0160	0.0320	ug/L	1	1.60	---	95	65-141%	---	---	
Dibenzofuran	1.62	0.0160	0.0320	ug/L	1	1.60	---	101	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 81 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		94 %		80-132 %		"						

LCS Dup (22B0663-BS1)				Prepared: 02/17/22 10:29 Analyzed: 02/17/22 14:49								Q-19	
EPA 8270E LVI													
Acenaphthene	1.53	0.0160	0.0320	ug/L	1	1.60	---	96	80-120%	1	30%		
Acenaphthylene	1.66	0.0160	0.0320	ug/L	1	1.60	---	104	80-124%	1	30%		
Anthracene	1.56	0.0160	0.0320	ug/L	1	1.60	---	98	80-123%	3	30%		
Benz(a)anthracene	1.51	0.00800	0.0160	ug/L	1	1.60	---	94	80-122%	5	30%		
Benzo(a)pyrene	1.63	0.00800	0.0160	ug/L	1	1.60	---	102	80-129%	2	30%		
Benzo(b)fluoranthene	1.56	0.00800	0.0160	ug/L	1	1.60	---	97	80-124%	0.7	30%		
Benzo(k)fluoranthene	1.59	0.00800	0.0160	ug/L	1	1.60	---	100	80-125%	3	30%		
Benzo(g,h,i)perylene	1.48	0.0160	0.0320	ug/L	1	1.60	---	92	80-120%	4	30%		
Chrysene	1.52	0.00800	0.0160	ug/L	1	1.60	---	95	80-120%	0.2	30%		
Dibenz(a,h)anthracene	1.58	0.00800	0.0160	ug/L	1	1.60	---	99	80-120%	2	30%		
Fluoranthene	1.68	0.0160	0.0320	ug/L	1	1.60	---	105	80-126%	1	30%		
Fluorene	1.68	0.0160	0.0320	ug/L	1	1.60	---	105	77-127%	3	30%		
Indeno(1,2,3-cd)pyrene	1.43	0.00800	0.0160	ug/L	1	1.60	---	90	80-121%	1	30%		
1-Methylnaphthalene	1.71	0.0320	0.0640	ug/L	1	1.60	---	107	53-148%	5	30%		
2-Methylnaphthalene	1.63	0.0320	0.0640	ug/L	1	1.60	---	102	48-150%	3	30%		
Naphthalene	1.51	0.0320	0.0640	ug/L	1	1.60	---	94	78-120%	0	30%		
Phenanthrene	1.51	0.0320	0.0640	ug/L	1	1.60	---	94	80-120%	2	30%		

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0663 - EPA 3511 (Bottle Extraction)						Water						
LCS Dup (22B0663-BSD1)			Prepared: 02/17/22 10:29 Analyzed: 02/17/22 14:49								Q-19	
Pyrene	1.68	0.0160	0.0320	ug/L	1	1.60	---	105	80-125%	0.8	30%	
Carbazole	1.60	0.0160	0.0320	ug/L	1	1.60	---	100	65-141%	5	30%	
Dibenzofuran	1.61	0.0160	0.0320	ug/L	1	1.60	---	101	76-121%	0.3	30%	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 83 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		97 %		80-132 %		"						

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3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0563 - EPA 3015A												
Water												
Blank (22B0563-BLK1)												
Prepared: 02/15/22 12:02 Analyzed: 02/17/22 02:15												
EPA 6020B												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Barium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	2.00	4.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	0.110	0.200	ug/L	1	---	---	---	---	---	---	
Mercury	ND	0.0400	0.0800	ug/L	1	---	---	---	---	---	---	
Selenium	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Silver	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Blank (22B0563-BLK2)												
Prepared: 02/15/22 12:02 Analyzed: 02/17/22 13:21												
EPA 6020B												
Chromium	ND	2.00	4.00	ug/L	1	---	---	---	---	---	---	Q-16
LCS (22B0563-BS1)												
Prepared: 02/15/22 12:02 Analyzed: 02/17/22 02:20												
EPA 6020B												
Arsenic	52.4	0.500	1.00	ug/L	1	55.6	---	94	80-120%	---	---	
Barium	54.3	1.00	2.00	ug/L	1	55.6	---	98	80-120%	---	---	
Cadmium	51.7	0.100	0.200	ug/L	1	55.6	---	93	80-120%	---	---	
Chromium	52.0	2.00	4.00	ug/L	1	55.6	---	94	80-120%	---	---	
Lead	50.7	0.110	0.200	ug/L	1	55.6	---	91	80-120%	---	---	
Mercury	1.00	0.0400	0.0800	ug/L	1	1.11	---	90	80-120%	---	---	
Selenium	26.7	0.500	1.00	ug/L	1	27.8	---	96	80-120%	---	---	
Silver	27.3	0.100	0.200	ug/L	1	27.8	---	98	80-120%	---	---	
Duplicate (22B0563-DUP1)												
Prepared: 02/15/22 12:02 Analyzed: 02/17/22 02:48												
QC Source Sample: B6-W-45 (A2B0415-06)												
EPA 6020B												
Arsenic	58.0	10.0	20.0	ug/L	20	---	62.3	---	---	7	20%	
Barium	997	20.0	40.0	ug/L	20	---	1050	---	---	5	20%	
Cadmium	ND	2.00	4.00	ug/L	20	---	ND	---	---	---	20%	
Chromium	173	40.0	80.0	ug/L	20	---	184	---	---	7	20%	
Lead	74.7	2.20	4.00	ug/L	20	---	78.0	---	---	4	20%	
Mercury	ND	0.800	1.60	ug/L	20	---	ND	---	---	---	20%	

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0563 - EPA 3015A						Water						
Duplicate (22B0563-DUP1)			Prepared: 02/15/22 12:02 Analyzed: 02/17/22 02:48									
QC Source Sample: B6-W-45 (A2B0415-06)												
Silver	ND	2.00	4.00	ug/L	20	---	ND	---	---	---	20%	
Duplicate (22B0563-DUP2)			Prepared: 02/15/22 12:02 Analyzed: 02/17/22 13:44									
QC Source Sample: B6-W-45 (A2B0415-06RE1)												
EPA 6020B												
Selenium	ND	10.0	20.0	ug/L	20	---	ND	---	---	---	20%	Q-16
Matrix Spike (22B0563-MS1)			Prepared: 02/15/22 12:02 Analyzed: 02/17/22 02:58									
QC Source Sample: B6-W-45-DUP (A2B0415-07)												
Arsenic	156	10.0	20.0	ug/L	20	55.6	116	73	75-125%	---	---	Q-04
Barium	2380	20.0	40.0	ug/L	20	55.6	2340	70	75-125%	---	---	Q-03
Cadmium	55.4	2.00	4.00	ug/L	20	55.6	2.29	96	75-125%	---	---	
Chromium	467	40.0	80.0	ug/L	20	55.6	430	67	75-125%	---	---	Q-04
Lead	229	2.20	4.00	ug/L	20	55.6	186	77	75-125%	---	---	
Mercury	1.76	0.800	1.60	ug/L	20	1.11	ND	158	75-125%	---	---	Q-04
Silver	27.9	2.00	4.00	ug/L	20	27.8	ND	101	75-125%	---	---	
Matrix Spike (22B0563-MS2)			Prepared: 02/15/22 12:02 Analyzed: 02/17/22 14:10									
QC Source Sample: B6-W-45-DUP (A2B0415-07RE1)												
Selenium	28.9	10.0	20.0	ug/L	20	27.8	ND	104	75-125%	---	---	Q-16

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0611 - EPA 3051A						Soil						
Blank (22B0611-BLK1)			Prepared: 02/16/22 09:58 Analyzed: 02/18/22 02:19									
EPA 6020B												
Arsenic	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	0.0963	0.193	mg/kg wet	10	---	---	---	---	---	---	
Chromium	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Lead	ND	0.0963	0.193	mg/kg wet	10	---	---	---	---	---	---	
Mercury	ND	0.0385	0.0771	mg/kg wet	10	---	---	---	---	---	---	
Selenium	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Silver	ND	0.0963	0.193	mg/kg wet	10	---	---	---	---	---	---	
LCS (22B0611-BS1)			Prepared: 02/16/22 09:58 Analyzed: 02/18/22 02:23									
EPA 6020B												
Arsenic	48.0	0.500	1.00	mg/kg wet	10	50.0	---	96	80-120%	---	---	
Barium	50.9	0.500	1.00	mg/kg wet	10	50.0	---	102	80-120%	---	---	
Cadmium	48.0	0.100	0.200	mg/kg wet	10	50.0	---	96	80-120%	---	---	
Chromium	48.9	0.500	1.00	mg/kg wet	10	50.0	---	98	80-120%	---	---	
Lead	48.4	0.100	0.200	mg/kg wet	10	50.0	---	97	80-120%	---	---	
Mercury	0.914	0.0400	0.0800	mg/kg wet	10	1.00	---	91	80-120%	---	---	
Selenium	23.6	0.500	1.00	mg/kg wet	10	25.0	---	94	80-120%	---	---	
Silver	23.4	0.100	0.200	mg/kg wet	10	25.0	---	94	80-120%	---	---	
Duplicate (22B0611-DUP1)			Prepared: 02/16/22 09:58 Analyzed: 02/18/22 02:52									
QC Source Sample: B6-S-11 (A2B0415-01)												
EPA 6020B												
Arsenic	4.64	0.617	1.23	mg/kg dry	10	---	5.29	---	---	13	20%	
Barium	86.2	0.617	1.23	mg/kg dry	10	---	93.1	---	---	8	20%	
Cadmium	ND	0.123	0.247	mg/kg dry	10	---	ND	---	---	---	20%	
Chromium	12.1	0.617	1.23	mg/kg dry	10	---	11.9	---	---	2	20%	
Lead	4.11	0.123	0.247	mg/kg dry	10	---	4.73	---	---	14	20%	
Mercury	ND	0.0493	0.0987	mg/kg dry	10	---	ND	---	---	---	20%	
Selenium	ND	0.617	1.23	mg/kg dry	10	---	ND	---	---	---	20%	
Silver	ND	0.123	0.247	mg/kg dry	10	---	ND	---	---	---	20%	

Matrix Spike (22B0611-MS1)

Prepared: 02/16/22 09:58 Analyzed: 02/18/22 02:57

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street
Portland, OR 97232

Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0611 - EPA 3051A						Soil						
Matrix Spike (22B0611-MS1)			Prepared: 02/16/22 09:58 Analyzed: 02/18/22 02:57									
QC Source Sample: B6-S-11 (A2B0415-01)												
EPA 6020B												
Arsenic	64.8	0.623	1.25	mg/kg dry	10	62.3	5.29	95	75-125%	---	---	
Barium	168	0.623	1.25	mg/kg dry	10	62.3	93.1	120	75-125%	---	---	
Cadmium	60.1	0.125	0.249	mg/kg dry	10	62.3	ND	96	75-125%	---	---	
Chromium	73.5	0.623	1.25	mg/kg dry	10	62.3	11.9	99	75-125%	---	---	
Lead	64.4	0.125	0.249	mg/kg dry	10	62.3	4.73	96	75-125%	---	---	
Mercury	1.15	0.0499	0.0997	mg/kg dry	10	1.25	ND	93	75-125%	---	---	
Selenium	29.2	0.623	1.25	mg/kg dry	10	31.2	ND	94	75-125%	---	---	
Silver	29.5	0.125	0.249	mg/kg dry	10	31.2	ND	95	75-125%	---	---	

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Philip Nerenberg

Philip Nerenberg, Lab Director

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3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0722 - EPA 3051A												
Soil												
Blank (22B0722-BLK1)												
Prepared: 02/18/22 12:30						Analyzed: 02/22/22 22:03						
EPA 6020B												
Arsenic	ND	0.481	0.962	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	0.481	0.962	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	0.0962	0.192	mg/kg wet	10	---	---	---	---	---	---	
Chromium	ND	0.481	0.962	mg/kg wet	10	---	---	---	---	---	---	
Lead	ND	0.0962	0.192	mg/kg wet	10	---	---	---	---	---	---	
Mercury	ND	0.0385	0.0769	mg/kg wet	10	---	---	---	---	---	---	
Selenium	ND	0.481	0.962	mg/kg wet	10	---	---	---	---	---	---	
Silver	ND	0.0962	0.192	mg/kg wet	10	---	---	---	---	---	---	
LCS (22B0722-BS1)												
Prepared: 02/18/22 12:30						Analyzed: 02/22/22 22:13						
EPA 6020B												
Arsenic	44.3	0.500	1.00	mg/kg wet	10	50.0	---	89	80-120%	---	---	
Barium	46.3	0.500	1.00	mg/kg wet	10	50.0	---	93	80-120%	---	---	
Cadmium	45.6	0.100	0.200	mg/kg wet	10	50.0	---	91	80-120%	---	---	
Chromium	47.4	0.500	1.00	mg/kg wet	10	50.0	---	95	80-120%	---	---	
Lead	51.2	0.100	0.200	mg/kg wet	10	50.0	---	102	80-120%	---	---	
Mercury	0.993	0.0400	0.0800	mg/kg wet	10	1.00	---	99	80-120%	---	---	
Selenium	22.4	0.500	1.00	mg/kg wet	10	25.0	---	90	80-120%	---	---	
Silver	22.7	0.100	0.200	mg/kg wet	10	25.0	---	91	80-120%	---	---	
Duplicate (22B0722-DUP1)												
Prepared: 02/18/22 12:30						Analyzed: 02/22/22 22:34						
QC Source Sample: B5-S-13.5 (A2B0415-25)												
EPA 6020B												
Arsenic	6.94	0.624	1.25	mg/kg dry	10	---	6.68	---	---	4	20%	
Barium	123	0.624	1.25	mg/kg dry	10	---	114	---	---	7	20%	
Cadmium	ND	0.125	0.249	mg/kg dry	10	---	ND	---	---	---	20%	
Chromium	24.5	0.624	1.25	mg/kg dry	10	---	20.2	---	---	19	20%	
Lead	5.72	0.125	0.249	mg/kg dry	10	---	5.38	---	---	6	20%	
Mercury	0.0641	0.0499	0.0998	mg/kg dry	10	---	ND	---	---	---	20%	
Selenium	ND	0.624	1.25	mg/kg dry	10	---	ND	---	---	---	20%	
Silver	ND	0.125	0.249	mg/kg dry	10	---	ND	---	---	---	20%	

Matrix Spike (22B0722-MS1)

Prepared: 02/18/22 12:30 Analyzed: 02/22/22 22:39

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Philip Nerenberg, Lab Director

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212****QUALITY CONTROL (QC) SAMPLE RESULTS****Total Metals by EPA 6020B (ICPMS)**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0722 - EPA 3051A						Soil						
Matrix Spike (22B0722-MS1)			Prepared: 02/18/22 12:30 Analyzed: 02/22/22 22:39									
QC Source Sample: B5-S-13.5 (A2B0415-25)												
EPA 6020B												
Arsenic	67.6	0.657	1.31	mg/kg dry	10	65.7	6.68	93	75-125%	---	---	
Barium	192	0.657	1.31	mg/kg dry	10	65.7	114	118	75-125%	---	---	
Cadmium	60.4	0.131	0.263	mg/kg dry	10	65.7	ND	92	75-125%	---	---	
Chromium	93.9	0.657	1.31	mg/kg dry	10	65.7	20.2	112	75-125%	---	---	
Lead	68.9	0.131	0.263	mg/kg dry	10	65.7	5.38	97	75-125%	---	---	
Mercury	1.29	0.0525	0.105	mg/kg dry	10	1.31	ND	98	75-125%	---	---	
Selenium	29.1	0.657	1.31	mg/kg dry	10	32.8	ND	89	75-125%	---	---	
Silver	30.0	0.131	0.263	mg/kg dry	10	32.8	ND	91	75-125%	---	---	

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0802 - EPA 3051A						Soil						
Blank (22B0802-BLK1)			Prepared: 02/22/22 10:14 Analyzed: 02/23/22 16:56									
EPA 6020B												
Arsenic	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	0.0963	0.193	mg/kg wet	10	---	---	---	---	---	---	
Chromium	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Selenium	ND	0.482	0.963	mg/kg wet	10	---	---	---	---	---	---	
Silver	ND	0.0963	0.193	mg/kg wet	10	---	---	---	---	---	---	
Blank (22B0802-BLK3)			Prepared: 02/22/22 10:14 Analyzed: 02/23/22 19:17									
EPA 6020B												
Lead	ND	0.0963	0.193	mg/kg wet	10	---	---	---	---	---	---	Q-16
Mercury	ND	0.0385	0.0771	mg/kg wet	10	---	---	---	---	---	---	Q-16
LCS (22B0802-BS1)			Prepared: 02/22/22 10:14 Analyzed: 02/23/22 19:23									
EPA 6020B												
Arsenic	45.8	0.500	1.00	mg/kg wet	10	50.0	---	92	80-120%	---	---	
Barium	49.4	0.500	1.00	mg/kg wet	10	50.0	---	99	80-120%	---	---	
Cadmium	46.3	0.100	0.200	mg/kg wet	10	50.0	---	93	80-120%	---	---	
Chromium	48.5	0.500	1.00	mg/kg wet	10	50.0	---	97	80-120%	---	---	
Lead	49.6	0.100	0.200	mg/kg wet	10	50.0	---	99	80-120%	---	---	
Mercury	0.954	0.0400	0.0800	mg/kg wet	10	1.00	---	95	80-120%	---	---	
Selenium	23.8	0.500	1.00	mg/kg wet	10	25.0	---	95	80-120%	---	---	
Silver	24.1	0.100	0.200	mg/kg wet	10	25.0	---	96	80-120%	---	---	Q-41
Duplicate (22B0802-DUP1)			Prepared: 02/22/22 10:14 Analyzed: 02/23/22 19:33									
QC Source Sample: Non-SDG (A2B0242-02)												
Arsenic	5.60	0.502	1.00	mg/kg dry	10	---	5.43	---	---	3	20%	PRO
Barium	181	0.502	1.00	mg/kg dry	10	---	172	---	---	5	20%	PRO
Cadmium	0.130	0.100	0.201	mg/kg dry	10	---	0.108	---	---	19	20%	PRO,J
Chromium	33.1	0.502	1.00	mg/kg dry	10	---	30.6	---	---	8	20%	PRO
Lead	14.1	0.100	0.201	mg/kg dry	10	---	13.9	---	---	1	20%	PRO
Mercury	0.0533	0.0402	0.0804	mg/kg dry	10	---	0.0496	---	---	7	20%	PRO,J
Selenium	0.523	0.502	1.00	mg/kg dry	10	---	ND	---	---		20%	PRO,J
Silver	ND	0.100	0.201	mg/kg dry	10	---	ND	---	---	---	20%	PRO

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

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Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0802 - EPA 3051A						Soil						
Matrix Spike (22B0802-MS1)			Prepared: 02/22/22 10:14 Analyzed: 02/23/22 19:38									
QC Source Sample: Non-SDG (A2B0242-02)												
EPA 6020B												
Arsenic	51.7	0.511	1.02	mg/kg dry	10	51.1	5.43	90	75-125%	---	---	PRO
Barium	244	0.511	1.02	mg/kg dry	10	51.1	172	141	75-125%	---	---	PRO,Q-01
Cadmium	47.9	0.102	0.205	mg/kg dry	10	51.1	0.108	94	75-125%	---	---	PRO
Chromium	85.4	0.511	1.02	mg/kg dry	10	51.1	30.6	107	75-125%	---	---	PRO
Lead	63.1	0.102	0.205	mg/kg dry	10	51.1	13.9	96	75-125%	---	---	PRO
Mercury	0.990	0.0409	0.0818	mg/kg dry	10	1.02	0.0496	92	75-125%	---	---	PRO
Selenium	22.1	0.511	1.02	mg/kg dry	10	25.6	ND	86	75-125%	---	---	PRO
Silver	24.3	0.102	0.205	mg/kg dry	10	25.6	ND	95	75-125%	---	---	PRO,Q-41

Apex Laboratories

Philip Nerenberg

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Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0579 - Matrix Matched Direct Inject						Water						
Blank (22B0579-BLK1)			Prepared: 02/15/22 14:30		Analyzed: 02/17/22 18:53							
EPA 6020B (Diss)												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Barium	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Mercury	ND	0.0400	0.0800	ug/L	1	---	---	---	---	---	---	
Selenium	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Silver	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
LCS (22B0579-BS1)			Prepared: 02/15/22 14:30		Analyzed: 02/17/22 18:57							
EPA 6020B (Diss)												
Arsenic	55.7	0.500	1.00	ug/L	1	55.6	---	100	80-120%	---	---	
Barium	57.1	0.500	1.00	ug/L	1	55.6	---	103	80-120%	---	---	
Cadmium	55.2	0.100	0.200	ug/L	1	55.6	---	99	80-120%	---	---	
Chromium	56.0	1.00	2.00	ug/L	1	55.6	---	101	80-120%	---	---	
Lead	54.4	0.100	0.200	ug/L	1	55.6	---	98	80-120%	---	---	
Mercury	1.17	0.0400	0.0800	ug/L	1	1.11	---	105	80-120%	---	---	
Selenium	28.8	0.500	1.00	ug/L	1	27.8	---	104	80-120%	---	---	
Silver	29.2	0.100	0.200	ug/L	1	27.8	---	105	80-120%	---	---	
Duplicate (22B0579-DUP1)			Prepared: 02/15/22 14:30		Analyzed: 02/17/22 19:07							
QC Source Sample: B6-W-45 (A2B0415-06)												
EPA 6020B (Diss)												
Arsenic	25.1	5.00	10.0	ug/L	10	---	28.5	---	---	13	20%	
Barium	293	5.00	10.0	ug/L	10	---	330	---	---	12	20%	
Cadmium	ND	1.00	2.00	ug/L	10	---	ND	---	---	---	20%	
Chromium	39.3	10.0	20.0	ug/L	10	---	47.2	---	---	18	20%	
Lead	23.2	1.00	2.00	ug/L	10	---	28.1	---	---	19	20%	
Mercury	ND	0.400	0.800	ug/L	10	---	ND	---	---	---	20%	
Selenium	ND	5.00	10.0	ug/L	10	---	ND	---	---	---	20%	
Silver	ND	1.00	2.00	ug/L	10	---	ND	---	---	---	20%	

Matrix Spike (22B0579-MS1)

Prepared: 02/15/22 14:30 Analyzed: 02/17/22 19:17

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

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Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0579 - Matrix Matched Direct Inject							Water					
Matrix Spike (22B0579-MS1)			Prepared: 02/15/22 14:30		Analyzed: 02/17/22 19:17							
QC Source Sample: B6-W-45-DUP (A2B0415-07)												
Arsenic	75.3	5.00	10.0	ug/L	10	55.6	20.7	98	75-125%	---	---	Q-04
Barium	269	5.00	10.0	ug/L	10	55.6	182	157	75-125%	---	---	
Cadmium	54.4	1.00	2.00	ug/L	10	55.6	ND	98	75-125%	---	---	
Chromium	78.6	10.0	20.0	ug/L	10	55.6	25.6	95	75-125%	---	---	
Lead	66.7	1.00	2.00	ug/L	10	55.6	14.4	94	75-125%	---	---	
Mercury	1.11	0.400	0.800	ug/L	10	1.11	ND	100	75-125%	---	---	
Selenium	25.0	5.00	10.0	ug/L	10	27.8	ND	90	75-125%	---	---	
Silver	25.7	1.00	2.00	ug/L	10	27.8	ND	92	75-125%	---	---	

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Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0772 - EPA 3015A - Dissolved						Water						
Blank (22B0772-BLK1)			Prepared: 02/21/22 12:19 Analyzed: 02/24/22 17:55									
EPA 6020B (Diss)												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Barium	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Mercury	ND	0.0400	0.0800	ug/L	1	---	---	---	---	---	---	
Selenium	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Silver	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
LCS (22B0772-BS1)			Prepared: 02/21/22 12:19 Analyzed: 02/24/22 18:00									
EPA 6020B (Diss)												
Arsenic	52.6	0.500	1.00	ug/L	1	55.6	---	95	80-120%	---	---	
Barium	56.3	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Cadmium	52.6	0.100	0.200	ug/L	1	55.6	---	95	80-120%	---	---	
Chromium	53.9	1.00	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Lead	53.3	0.100	0.200	ug/L	1	55.6	---	96	80-120%	---	---	
Mercury	1.04	0.0400	0.0800	ug/L	1	1.11	---	94	80-120%	---	---	
Selenium	25.1	0.500	1.00	ug/L	1	27.8	---	90	80-120%	---	---	
Silver	25.7	0.100	0.200	ug/L	1	27.8	---	93	80-120%	---	---	
Duplicate (22B0772-DUP1)			Prepared: 02/21/22 12:19 Analyzed: 02/24/22 18:21									
QC Source Sample: B6-W-45 (A2B0415-06RE1)												
EPA 6020B (Diss)												
Arsenic	38.3	2.50	5.00	ug/L	5	---	33.2	---	---	14	20%	
Barium	452	2.50	5.00	ug/L	5	---	425	---	---	6	20%	
Cadmium	0.549	0.500	1.00	ug/L	5	---	ND	---	---		20%	
Chromium	78.9	5.00	10.0	ug/L	5	---	70.9	---	---	11	20%	
Lead	35.0	0.500	1.00	ug/L	5	---	35.0	---	---	0.01	20%	
Mercury	ND	0.200	0.400	ug/L	5	---	ND	---	---	---	20%	
Selenium	2.64	2.50	5.00	ug/L	5	---	2.70	---	---	2	20%	
Silver	ND	0.500	1.00	ug/L	5	---	ND	---	---	---	20%	

Matrix Spike (22B0772-MS1)

Prepared: 02/21/22 12:19 Analyzed: 02/24/22 18:31

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

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503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0772 - EPA 3015A - Dissolved							Water					
Matrix Spike (22B0772-MS1)			Prepared: 02/21/22 12:19		Analyzed: 02/24/22 18:31							
QC Source Sample: B6-W-45-DUP (A2B0415-07RE1)												
Arsenic	77.8	2.50	5.00	ug/L	5	55.6	32.1	82	75-125%	---	---	
Barium	329	2.50	5.00	ug/L	5	55.6	286	78	75-125%	---	---	
Cadmium	52.2	0.500	1.00	ug/L	5	55.6	ND	94	75-125%	---	---	
Chromium	100	5.00	10.0	ug/L	5	55.6	51.2	88	75-125%	---	---	
Lead	74.2	0.500	1.00	ug/L	5	55.6	21.9	94	75-125%	---	---	
Mercury	1.24	0.200	0.400	ug/L	5	1.11	ND	112	75-125%	---	---	
Selenium	25.5	2.50	5.00	ug/L	5	27.8	ND	92	75-125%	---	---	
Silver	27.5	0.500	1.00	ug/L	5	27.8	ND	99	75-125%	---	---	Q-41

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Philip Nerenberg

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**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212****QUALITY CONTROL (QC) SAMPLE RESULTS****Percent Dry Weight**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0505 - Total Solids (Dry Weight)							Soil					
Duplicate (22B0505-DUP1)			Prepared: 02/14/22 12:39 Analyzed: 02/15/22 10:49									
QC Source Sample: Non-SDG (A2B0413-01)												
% Solids	90.7	1.00	1.00	%	1	---	91.7	---	---	1	10%	
Duplicate (22B0505-DUP2)			Prepared: 02/14/22 12:39 Analyzed: 02/15/22 10:49									
QC Source Sample: Non-SDG (A2B0414-01)												
% Solids	77.0	1.00	1.00	%	1	---	77.1	---	---	0.06	10%	
Duplicate (22B0505-DUP3)			Prepared: 02/14/22 12:40 Analyzed: 02/15/22 10:49									
QC Source Sample: B6-S-11 (A2B0415-01)												
EPA 8000D												
% Solids	82.5	1.00	1.00	%	1	---	88.3	---	---	7	10%	
Duplicate (22B0505-DUP4)			Prepared: 02/14/22 12:40 Analyzed: 02/15/22 10:49									
QC Source Sample: Non-SDG (A2B0416-01)												
% Solids	94.4	1.00	1.00	%	1	---	94.4	---	---	0.03	10%	
Duplicate (22B0505-DUP5)			Prepared: 02/14/22 12:40 Analyzed: 02/15/22 10:49									
QC Source Sample: Non-SDG (A2B0436-01)												
% Solids	75.2	1.00	1.00	%	1	---	75.0	---	---	0.3	10%	
Duplicate (22B0505-DUP6)			Prepared: 02/14/22 18:31 Analyzed: 02/15/22 10:49									
QC Source Sample: Non-SDG (A2B0479-01)												
% Solids	65.3	1.00	1.00	%	1	---	67.2	---	---	3	10%	
Duplicate (22B0505-DUP7)			Prepared: 02/14/22 18:31 Analyzed: 02/15/22 10:49									
QC Source Sample: Non-SDG (A2B0479-02)												
% Solids	70.4	1.00	1.00	%	1	---	71.0	---	---	0.9	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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Philip Nerenberg, Lab Director

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6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22B0626 - Total Solids (Dry Weight)							Soil					
Duplicate (22B0626-DUP1)			Prepared: 02/16/22 12:28 Analyzed: 02/17/22 08:23									
QC Source Sample: Non-SDG (A2B0546-07)												
% Solids	84.6	1.00	1.00	%	1	---	85.6	---	---	1	10%	
Duplicate (22B0626-DUP2)			Prepared: 02/16/22 12:28 Analyzed: 02/17/22 08:23									
QC Source Sample: Non-SDG (A2B0546-06)												
% Solids	89.2	1.00	1.00	%	1	---	84.1	---	---	6	10%	
Duplicate (22B0626-DUP3)			Prepared: 02/16/22 18:06 Analyzed: 02/17/22 08:23									
QC Source Sample: Non-SDG (A2B0595-02)												
% Solids	84.4	1.00	1.00	%	1	---	84.5	---	---	0.2	10%	
Duplicate (22B0626-DUP4)			Prepared: 02/16/22 18:06 Analyzed: 02/17/22 08:23									
QC Source Sample: Non-SDG (A2B0596-01)												
% Solids	78.1	1.00	1.00	%	1	---	77.3	---	---	1	10%	
Duplicate (22B0626-DUP5)			Prepared: 02/16/22 18:17 Analyzed: 02/17/22 08:23									
QC Source Sample: Non-SDG (A2B0596-02)												
% Solids	76.5	1.00	1.00	%	1	---	74.7	---	---	2	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3510C (Fuels/Acid Ext.)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22B0534							
A2B0415-06	Water	NWTPH-Dx	02/10/22 12:20	02/15/22 11:31	720mL/5mL	1000mL/5mL	1.39
A2B0415-07	Water	NWTPH-Dx	02/10/22 12:20	02/15/22 11:31	800mL/5mL	1000mL/5mL	1.25
A2B0415-12	Water	NWTPH-Dx	02/10/22 15:20	02/15/22 11:31	860mL/5mL	1000mL/5mL	1.16

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22B0653							
A2B0415-01	Soil	NWTPH-Dx	02/10/22 09:30	02/17/22 10:13	10.22g/5mL	10g/5mL	0.98
A2B0415-02	Soil	NWTPH-Dx	02/10/22 09:50	02/17/22 10:13	10.84g/5mL	10g/5mL	0.92
A2B0415-03	Soil	NWTPH-Dx	02/10/22 10:15	02/17/22 10:13	10.23g/5mL	10g/5mL	0.98
A2B0415-04	Soil	NWTPH-Dx	02/10/22 11:00	02/17/22 10:13	10.35g/5mL	10g/5mL	0.97
A2B0415-05	Soil	NWTPH-Dx	02/10/22 11:20	02/17/22 10:13	10.1g/5mL	10g/5mL	0.99
A2B0415-08	Soil	NWTPH-Dx	02/10/22 13:20	02/17/22 10:13	10.55g/5mL	10g/5mL	0.95
A2B0415-09	Soil	NWTPH-Dx	02/10/22 13:50	02/17/22 10:13	10.63g/5mL	10g/5mL	0.94
A2B0415-10	Soil	NWTPH-Dx	02/10/22 14:20	02/17/22 10:13	10.36g/5mL	10g/5mL	0.97
A2B0415-11	Soil	NWTPH-Dx	02/10/22 15:00	02/17/22 10:13	10.38g/5mL	10g/5mL	0.96
A2B0415-14	Soil	NWTPH-Dx	02/09/22 12:55	02/17/22 10:13	10.82g/5mL	10g/5mL	0.92
A2B0415-18	Soil	NWTPH-Dx	02/09/22 13:50	02/17/22 10:13	10.44g/5mL	10g/5mL	0.96
A2B0415-21	Soil	NWTPH-Dx	02/09/22 12:20	02/17/22 10:13	10.81g/5mL	10g/5mL	0.93
A2B0415-25	Soil	NWTPH-Dx	02/09/22 10:40	02/17/22 10:13	10.63g/5mL	10g/5mL	0.94
A2B0415-27	Soil	NWTPH-Dx	02/09/22 14:25	02/17/22 10:13	10.71g/5mL	10g/5mL	0.93
A2B0415-29	Soil	NWTPH-Dx	02/10/22 11:40	02/17/22 10:13	10.49g/5mL	10g/5mL	0.95
A2B0415-30	Soil	NWTPH-Dx	02/10/22 11:45	02/17/22 10:13	10.64g/5mL	10g/5mL	0.94
A2B0415-32	Soil	NWTPH-Dx	02/09/22 10:40	02/17/22 10:15	10.66g/5mL	10g/5mL	0.94
Batch: 22B0679							
A2B0415-34	Soil	NWTPH-Dx	02/09/22 10:45	02/17/22 13:30	10.15g/5mL	10g/5mL	0.99
A2B0415-36	Soil	NWTPH-Dx	02/09/22 08:30	02/17/22 13:30	10.8g/5mL	10g/5mL	0.93
A2B0415-38	Soil	NWTPH-Dx	02/09/22 08:35	02/17/22 13:30	10.26g/5mL	10g/5mL	0.98

BTEX Compounds by EPA 8260D

Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22B0471							
A2B0415-06	Water	EPA 8260D	02/10/22 12:20	02/12/22 13:52	5mL/5mL	5mL/5mL	1.00

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Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

SAMPLE PREPARATION INFORMATION

BTEX Compounds by EPA 8260D

Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A2B0415-07	Water	EPA 8260D	02/10/22 12:20	02/12/22 13:52	5mL/5mL	5mL/5mL	1.00
A2B0415-12	Water	EPA 8260D	02/10/22 15:20	02/12/22 13:52	5mL/5mL	5mL/5mL	1.00

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22B0745							
A2B0415-01	Soil	5035A/8260D	02/10/22 09:30	02/10/22 09:30	6.79g/5mL	5g/5mL	0.74
A2B0415-02	Soil	5035A/8260D	02/10/22 09:50	02/10/22 09:50	6.16g/5mL	5g/5mL	0.81
A2B0415-03	Soil	5035A/8260D	02/10/22 10:15	02/10/22 10:15	6.26g/5mL	5g/5mL	0.80
A2B0415-04	Soil	5035A/8260D	02/10/22 11:00	02/10/22 11:00	4.9g/5mL	5g/5mL	1.02
A2B0415-05	Soil	5035A/8260D	02/10/22 11:20	02/10/22 11:20	6.43g/5mL	5g/5mL	0.78
A2B0415-08	Soil	5035A/8260D	02/10/22 13:20	02/10/22 13:20	7.44g/5mL	5g/5mL	0.67
A2B0415-09	Soil	5035A/8260D	02/10/22 13:50	02/10/22 13:50	6.77g/5mL	5g/5mL	0.74
Batch: 22B0751							
A2B0415-10	Soil	5035A/8260D	02/10/22 14:20	02/10/22 14:20	7.95g/5mL	5g/5mL	0.63
A2B0415-11	Soil	5035A/8260D	02/10/22 15:00	02/10/22 15:00	6.98g/5mL	5g/5mL	0.72
A2B0415-14	Soil	5035A/8260D	02/09/22 12:55	02/09/22 12:55	5.28g/5mL	5g/5mL	0.95
A2B0415-18	Soil	5035A/8260D	02/09/22 13:50	02/09/22 13:50	5.66g/5mL	5g/5mL	0.88
A2B0415-21	Soil	5035A/8260D	02/09/22 12:20	02/09/22 12:20	5.17g/5mL	5g/5mL	0.97
A2B0415-25	Soil	5035A/8260D	02/09/22 10:40	02/09/22 10:40	5.74g/5mL	5g/5mL	0.87
A2B0415-27	Soil	5035A/8260D	02/09/22 14:25	02/09/22 14:25	5.67g/5mL	5g/5mL	0.88
A2B0415-29	Soil	5035A/8260D	02/10/22 11:40	02/10/22 11:40	6.12g/5mL	5g/5mL	0.82
A2B0415-30	Soil	5035A/8260D	02/10/22 11:45	02/10/22 11:45	6.41g/5mL	5g/5mL	0.78

Polychlorinated Biphenyls by EPA 8082A

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22B0705							
A2B0415-01	Soil	EPA 8082A	02/10/22 09:30	02/18/22 10:07	10.14g/5mL	10g/5mL	0.99
A2B0415-02	Soil	EPA 8082A	02/10/22 09:50	02/18/22 10:07	10.34g/5mL	10g/5mL	0.97
A2B0415-03	Soil	EPA 8082A	02/10/22 10:15	02/18/22 10:07	10.19g/5mL	10g/5mL	0.98
A2B0415-04	Soil	EPA 8082A	02/10/22 11:00	02/18/22 10:07	10.35g/5mL	10g/5mL	0.97
A2B0415-05	Soil	EPA 8082A	02/10/22 11:20	02/18/22 10:07	10.22g/5mL	10g/5mL	0.98
A2B0415-08	Soil	EPA 8082A	02/10/22 13:20	02/18/22 10:07	10.21g/5mL	10g/5mL	0.98
A2B0415-09	Soil	EPA 8082A	02/10/22 13:50	02/18/22 10:07	10.5g/5mL	10g/5mL	0.95
A2B0415-10	Soil	EPA 8082A	02/10/22 14:20	02/18/22 10:07	10.42g/5mL	10g/5mL	0.96

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Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

SAMPLE PREPARATION INFORMATION

Polychlorinated Biphenyls by EPA 8082A

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A2B0415-29	Soil	EPA 8082A	02/10/22 11:40	02/18/22 07:39	10.35g/5mL	10g/5mL	0.97
A2B0415-30	Soil	EPA 8082A	02/10/22 11:45	02/18/22 07:39	10.4g/5mL	10g/5mL	0.96
A2B0415-32	Soil	EPA 8082A	02/09/22 10:40	02/18/22 07:39	10.23g/5mL	10g/5mL	0.98
A2B0415-34	Soil	EPA 8082A	02/09/22 10:45	02/18/22 07:39	10.22g/5mL	10g/5mL	0.98
A2B0415-36	Soil	EPA 8082A	02/09/22 08:30	02/18/22 07:39	10.28g/5mL	10g/5mL	0.97
A2B0415-38	Soil	EPA 8082A	02/09/22 08:35	02/18/22 07:39	10.27g/5mL	10g/5mL	0.97
<u>Batch: 22B0931</u>							
A2B0415-11RE2	Soil	EPA 8082A	02/10/22 15:00	02/25/22 07:44	10.58g/5mL	10g/5mL	0.95

Polychlorinated Biphenyls -- EPA 8082A

Prep: EPA 3510C (Neutral pH)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0747</u>							
A2B0415-06	Water	EPA 8082A	02/10/22 12:20	02/21/22 06:58	770mL/2mL	1000mL/2mL	1.30
A2B0415-07	Water	EPA 8082A	02/10/22 12:20	02/21/22 06:58	800mL/2mL	1000mL/2mL	1.25
A2B0415-12	Water	EPA 8082A	02/10/22 15:20	02/21/22 06:58	550mL/2mL	1000mL/2mL	1.82

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E SIM

Prep: EPA 3510C (Acid Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0652</u>							
A2B0415-12	Water	EPA 8270E SIM	02/10/22 15:20	02/17/22 14:50	300mL/1mL	1000mL/1mL	3.33

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0542</u>							
A2B0415-21	Soil	EPA 8270E SIM	02/09/22 12:20	02/15/22 14:29	10.6g/5mL	10g/5mL	0.94
A2B0415-25	Soil	EPA 8270E SIM	02/09/22 10:40	02/15/22 14:29	10.08g/5mL	10g/5mL	0.99
A2B0415-27	Soil	EPA 8270E SIM	02/09/22 14:25	02/15/22 14:29	10.19g/5mL	10g/5mL	0.98
<u>Batch: 22B0659</u>							
A2B0415-02	Soil	EPA 8270E SIM	02/10/22 09:50	02/17/22 14:46	10.4g/5mL	10g/5mL	0.96
A2B0415-03	Soil	EPA 8270E SIM	02/10/22 10:15	02/17/22 14:46	10.44g/5mL	10g/5mL	0.96

Apex Laboratories

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Philip Nerenberg, Lab Director

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212****SAMPLE PREPARATION INFORMATION****Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (SIM)****Prep: EPA 3546**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A2B0415-04	Soil	EPA 8270E SIM	02/10/22 11:00	02/17/22 14:46	10.03g/5mL	10g/5mL	1.00
A2B0415-05	Soil	EPA 8270E SIM	02/10/22 11:20	02/17/22 14:46	10.67g/5mL	10g/5mL	0.94
A2B0415-08	Soil	EPA 8270E SIM	02/10/22 13:20	02/17/22 14:46	10.1g/5mL	10g/5mL	0.99
A2B0415-09	Soil	EPA 8270E SIM	02/10/22 13:50	02/17/22 14:46	10.7g/5mL	10g/5mL	0.94
A2B0415-10	Soil	EPA 8270E SIM	02/10/22 14:20	02/17/22 14:46	10.06g/5mL	10g/5mL	0.99
A2B0415-11	Soil	EPA 8270E SIM	02/10/22 15:00	02/17/22 14:46	10.18g/5mL	10g/5mL	0.98
A2B0415-14	Soil	EPA 8270E SIM	02/09/22 12:55	02/17/22 14:46	10.43g/5mL	10g/5mL	0.96
A2B0415-18	Soil	EPA 8270E SIM	02/09/22 13:50	02/17/22 14:46	10.92g/5mL	10g/5mL	0.92
A2B0415-29	Soil	EPA 8270E SIM	02/10/22 11:40	02/17/22 14:46	10.01g/5mL	10g/5mL	1.00
A2B0415-30	Soil	EPA 8270E SIM	02/10/22 11:45	02/17/22 14:46	10.38g/5mL	10g/5mL	0.96
A2B0415-32	Soil	EPA 8270E SIM	02/09/22 10:40	02/17/22 14:46	10.85g/5mL	10g/5mL	0.92
A2B0415-34	Soil	EPA 8270E SIM	02/09/22 10:45	02/17/22 14:46	10.95g/5mL	10g/5mL	0.91
A2B0415-36	Soil	EPA 8270E SIM	02/09/22 08:30	02/17/22 14:46	10.5g/5mL	10g/5mL	0.95
A2B0415-38	Soil	EPA 8270E SIM	02/09/22 08:35	02/17/22 14:46	10.54g/5mL	10g/5mL	0.95

Batch: 22B0814

A2B0415-01	Soil	EPA 8270E SIM	02/10/22 09:30	02/22/22 12:53	10.68g/5mL	10g/5mL	0.94
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Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)**Prep: EPA 3511 (Bottle Extraction)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0663</u>							
A2B0415-06	Water	EPA 8270E LVI	02/10/22 12:20	02/17/22 10:29	99.88mL/5mL	125mL/5mL	1.25
A2B0415-07	Water	EPA 8270E LVI	02/10/22 12:20	02/17/22 10:29	94.72mL/5mL	125mL/5mL	1.32

Total Metals by EPA 6020B (ICPMS)**Prep: EPA 3015A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0563</u>							
A2B0415-06	Water	EPA 6020B	02/10/22 12:20	02/15/22 12:02	45mL/50mL	45mL/50mL	1.00
A2B0415-06RE1	Water	EPA 6020B	02/10/22 12:20	02/15/22 12:02	45mL/50mL	45mL/50mL	1.00
A2B0415-07	Water	EPA 6020B	02/10/22 12:20	02/15/22 12:02	45mL/50mL	45mL/50mL	1.00
A2B0415-07RE1	Water	EPA 6020B	02/10/22 12:20	02/15/22 12:02	45mL/50mL	45mL/50mL	1.00
A2B0415-12	Water	EPA 6020B	02/10/22 15:20	02/15/22 12:02	45mL/50mL	45mL/50mL	1.00
A2B0415-12RE1	Water	EPA 6020B	02/10/22 15:20	02/15/22 12:02	45mL/50mL	45mL/50mL	1.00

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Philip Nerenberg, Lab Director



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Maul Foster & Alongi, INC.**3140 NE Broadway Street
Portland, OR 97232Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212**

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0611</u>							
A2B0415-01	Soil	EPA 6020B	02/10/22 09:30	02/16/22 09:58	0.479g/50mL	0.5g/50mL	1.04
A2B0415-02	Soil	EPA 6020B	02/10/22 09:50	02/16/22 09:58	0.493g/50mL	0.5g/50mL	1.01
A2B0415-03	Soil	EPA 6020B	02/10/22 10:15	02/16/22 09:58	0.481g/50mL	0.5g/50mL	1.04
A2B0415-04	Soil	EPA 6020B	02/10/22 11:00	02/16/22 09:58	0.502g/50mL	0.5g/50mL	1.00
A2B0415-05	Soil	EPA 6020B	02/10/22 11:20	02/16/22 09:58	0.483g/50mL	0.5g/50mL	1.04
A2B0415-08	Soil	EPA 6020B	02/10/22 13:20	02/16/22 09:58	0.503g/50mL	0.5g/50mL	0.99
A2B0415-09	Soil	EPA 6020B	02/10/22 13:50	02/16/22 09:58	0.512g/50mL	0.5g/50mL	0.98
A2B0415-10	Soil	EPA 6020B	02/10/22 14:20	02/16/22 09:58	0.478g/50mL	0.5g/50mL	1.05
A2B0415-11	Soil	EPA 6020B	02/10/22 15:00	02/16/22 09:58	0.514g/50mL	0.5g/50mL	0.97
A2B0415-14	Soil	EPA 6020B	02/09/22 12:55	02/16/22 09:58	0.467g/50mL	0.5g/50mL	1.07
A2B0415-18	Soil	EPA 6020B	02/09/22 13:50	02/16/22 09:58	0.458g/50mL	0.5g/50mL	1.09
A2B0415-21	Soil	EPA 6020B	02/09/22 12:20	02/16/22 09:58	0.519g/50mL	0.5g/50mL	0.96
<u>Batch: 22B0722</u>							
A2B0415-25	Soil	EPA 6020B	02/09/22 10:40	02/18/22 12:30	0.487g/50mL	0.5g/50mL	1.03
A2B0415-27	Soil	EPA 6020B	02/09/22 14:25	02/18/22 12:30	0.466g/50mL	0.5g/50mL	1.07
A2B0415-29	Soil	EPA 6020B	02/10/22 11:40	02/18/22 12:30	0.472g/50mL	0.5g/50mL	1.06
A2B0415-32	Soil	EPA 6020B	02/09/22 10:40	02/18/22 12:30	0.509g/50mL	0.5g/50mL	0.98
A2B0415-34	Soil	EPA 6020B	02/09/22 10:45	02/18/22 12:30	0.476g/50mL	0.5g/50mL	1.05
A2B0415-36	Soil	EPA 6020B	02/09/22 08:30	02/18/22 12:30	0.46g/50mL	0.5g/50mL	1.09
A2B0415-38	Soil	EPA 6020B	02/09/22 08:35	02/18/22 12:30	0.475g/50mL	0.5g/50mL	1.05
<u>Batch: 22B0802</u>							
A2B0415-30	Soil	EPA 6020B	02/10/22 11:45	02/22/22 10:14	0.461g/50mL	0.5g/50mL	1.08

Dissolved Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A - Dissolved

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0772</u>							
A2B0415-06RE1	Water	EPA 6020B (Diss)	02/10/22 12:20	02/21/22 12:19	45mL/50mL	45mL/50mL	1.00
A2B0415-07RE1	Water	EPA 6020B (Diss)	02/10/22 12:20	02/21/22 12:19	45mL/50mL	45mL/50mL	1.00
A2B0415-12RE1	Water	EPA 6020B (Diss)	02/10/22 15:20	02/21/22 12:19	45mL/50mL	45mL/50mL	1.00
A2B0415-12RE3	Water	EPA 6020B (Diss)	02/10/22 15:20	02/21/22 12:19	45mL/50mL	45mL/50mL	1.00

Percent Dry Weight

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Philip Nerenberg, Lab Director

**ANALYTICAL REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: **POSC-Cascade Business Park**Project Number: **M0350.04.001**Project Manager: **Emily Hess****Report ID:****A2B0415 - 03 07 22 1212****SAMPLE PREPARATION INFORMATION****Percent Dry Weight****Prep: Total Solids (Dry Weight)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 22B0505</u>							
A2B0415-01	Soil	EPA 8000D	02/10/22 09:30	02/14/22 12:39			NA
A2B0415-02	Soil	EPA 8000D	02/10/22 09:50	02/14/22 12:39			NA
A2B0415-03	Soil	EPA 8000D	02/10/22 10:15	02/14/22 12:39			NA
A2B0415-04	Soil	EPA 8000D	02/10/22 11:00	02/14/22 12:39			NA
A2B0415-05	Soil	EPA 8000D	02/10/22 11:20	02/14/22 12:40			NA
A2B0415-08	Soil	EPA 8000D	02/10/22 13:20	02/14/22 12:40			NA
A2B0415-09	Soil	EPA 8000D	02/10/22 13:50	02/14/22 12:40			NA
A2B0415-10	Soil	EPA 8000D	02/10/22 14:20	02/14/22 12:40			NA
A2B0415-11	Soil	EPA 8000D	02/10/22 15:00	02/14/22 12:40			NA
A2B0415-14	Soil	EPA 8000D	02/09/22 12:55	02/14/22 12:40			NA
A2B0415-18	Soil	EPA 8000D	02/09/22 13:50	02/14/22 12:40			NA
A2B0415-21	Soil	EPA 8000D	02/09/22 12:20	02/14/22 12:40			NA
A2B0415-25	Soil	EPA 8000D	02/09/22 10:40	02/14/22 12:40			NA
A2B0415-27	Soil	EPA 8000D	02/09/22 14:25	02/14/22 12:40			NA
A2B0415-29	Soil	EPA 8000D	02/10/22 11:40	02/14/22 12:40			NA
A2B0415-30	Soil	EPA 8000D	02/10/22 11:45	02/14/22 12:40			NA
<u>Batch: 22B0626</u>							
A2B0415-32	Soil	EPA 8000D	02/09/22 10:40	02/16/22 18:06			NA
A2B0415-34	Soil	EPA 8000D	02/09/22 10:45	02/16/22 18:06			NA
A2B0415-36	Soil	EPA 8000D	02/09/22 08:30	02/16/22 18:06			NA
A2B0415-38	Soil	EPA 8000D	02/09/22 08:35	02/16/22 18:06			NA

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3140 NE Broadway Street
Portland, OR 97232

Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- C-07** Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
- J** Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
- PRES** Incomplete field preservation. Additional preservative was added to adjust the pH within the appropriate range for this analysis.
- PRO** Sample has undergone sample processing prior to extraction and analysis.
- Q-01** Spike recovery and/or RPD is outside acceptance limits.
- Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-04** Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- Q-41** Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
- Q-42** Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- R-04** Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.
"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

Philip Nerenberg, Lab Director

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ORELAP ID: OR100062

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Portland, OR 97232

Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

Philip Nerenberg, Lab Director

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ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street
Portland, OR 97232

Project: **POSC-Cascade Business Park**

Project Number: **M0350.04.001**

Project Manager: **Emily Hess**

Report ID:

A2B0415 - 03 07 22 1212

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
--------	----------	--------	---------	--------	---------------

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Philip Nerenberg, Lab Director

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Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

APEX LABS		CHAIN OF CUSTODY		Lab # <u>12B0415</u> coc 1 of 4	
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323		Project Mgr: Ben Johnson Hess		Project Name: POSC-Cascade Business Park	
Company: MFA		Project #: 0350.04.01		PO #	
Address: 189 E 13th St. Vancouver, WA 98660		Phone: 260 950 2447		Email: ehess@maul-foster.com	
Sampled by: S. Colee, E. Hess		ANALYSIS REQUEST		Hold Sample	
SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST
OR <u>WA</u> CA					
AK ID					
B6-S-11	2/10/22	930	S	3	☒ 8260 Halo VOCs ☒ 8260 RBDM VOCs ☒ 8260 BTEX ☒ 8270 SIM PAHs ☒ 8270 Semi-Vols Full List ☒ 8082 PCBs ☒ 8081 Pesticides ☒ RCRA Metals (8) ☒ Priority Metals (13) ☒ AL, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, P, V, Zn ☒ TC.P Metals (8) ☒ TC.P Metals (8)
B6-S-21		950	S	3	
B6-S-31		1015	S	3	
B6-S-41		1100	S	3	
B6-S-49.5		1120	S	3	
B6-S-45		1200	S	11	
B6-S-45-DUP		1230	S	10	
B7-S-11		1320	S	3	
B7-S-21		1350	S	3	
B7-S-29.5		1420	S	3	

SPECIAL INSTRUCTIONS:	
Standard Turn Around Time (TAT) = 10 Business Days	
TAT Requested (circle)	Other:
1 Day	3 Day
5 Day	Other:
SAMPLES ARE HELD FOR 30 DAYS	
RELINQUISHED BY:	RECEIVED BY:
Signature: <u>S. Colee</u>	Signature: <u>Michael Kucharski</u>
Date: <u>2/11/22</u>	Date: <u>2-11-22</u>
Printed Name: <u>SARAH COLEE</u>	Printed Name: <u>Michael Kucharski</u>
Time: <u>1130</u>	Time: <u>1130</u>
Company: <u>MFA</u>	Company: <u>Apex Lab</u>



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

APEX LABS		CHAIN OF CUSTODY		Lab # <u>1920615003</u> of <u>4</u>																		
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323		Project Name: <u>POSC-CBP</u>		Project #: <u>0350.04.01</u>																		
Company: <u>MFA</u>		Project Mgr: <u>Emily Hess</u>		PO # <u>0350.04.01</u>																		
Address: <u>109 E 13TH ST, VANC., WA</u>		Phone: <u>360-930-2491</u>		Email: <u>ewes@maul-foster.com</u>																		
Sampled by: <u>S. COVEE, E. HESS</u>		ANALYSIS REQUEST																				
Site Location: <u>OR WA CA</u>																						
AK ID <u>---</u>																						
SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-DX	NWTPH-GX	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pesticides	RCRA Metals (8)	Priority Metals (13)	AL, Sb, As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Se, Si, Ti, V, Zn, Hg, Mg, Mn, Mo, Ni, K, TOTAL DISS. TCLP	TCLP Metals (8)	Hold Sample	Frozen Archive	
04-S-8	7/1/12	1220	S	3		X																
05-S-3	7/1/12	1010	S	3																		
05-S-17	7/1/12	1015	S	3																		
05-S-11	7/1/12	1020	S	3																		
05-S-13.5	7/1/12	1020	S	3																		
03-S-3	7/1/12	1420	S	3																		
03-S-5	7/1/12	1425	S	3																		
03-S-8	7/1/12	1430	S	3																		
014-S-7	7/10/12	1140	S	3																		
014-S-9.5	7/10/12	1145	S	3																		

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle) 5 Day 1 Day 2 Day 3 Day Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:		RECEIVED BY:	
Signature:	Date:	Signature:	Date:
<u>[Signature]</u>	<u>7/1/12</u>	<u>[Signature]</u>	<u>7/1/12</u>
Printed Name:	Time:	Printed Name:	Time:
<u>SARAH COLE</u>	<u>1130</u>	<u>M. Kachnik</u>	<u>150</u>
Company:		Company:	
<u>MFA</u>		<u>Apex Labs</u>	

SPECIAL INSTRUCTIONS: Hand = hold pending analysis

Apex Laboratories

Philip Nerenberg

Philip Nerenberg, Lab Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Maul Foster & Alongi, INC.

3140 NE Broadway Street

Portland, OR 97232

Project: POSC-Cascade Business Park

Project Number: M0350.04.001

Project Manager: Emily Hess

Report ID:

A2B0415 - 03 07 22 1212

APEX LABS COOLER RECEIPT FORM

Client: MFA Element WO#: A2 B0415

Project/Project #: POSC-Cascade Business Park / 0350.04.01

Delivery Info:

Date/time received: 2-11-22 @ 1130 By: MK

Delivered by: Apex ☒ Client ☐ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐

Cooler Inspection Date/time inspected: 2-11-22 @ 1415 By: MK

Chain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	2.6	3.9	1.9	1.1			
Received on ice? (Y/N)	Y	Y	Y	Y			
Temp. blanks? (Y/N)	Y	Y	Y	Y			
Ice type: (Gel/Real/Other)	Real	"	"	"			
Condition:	good	"	"	"			

Cooler out of temp? (Y/N) Possible reason why:

Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐

Sample Inspection: Date/time inspected: 2/11/22 @ 1522 By: LB

All samples intact? Yes ☒ No ☐ Comments:Bottle labels/COCs agree? Yes ☐ No ☒ Comments: 1/3 vials
Label reads B7-W-
LOL reads B7-W-25. B6-W-45-Dup-no info on FF NitricCOC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments:Do VOA vials have visible headspace? Yes ☒ No ☐ NA ☐

Comments: Sediment in all vials. 2/3 vials have HS on B6-W-45-Dup,*

Water samples: pH checked: Yes ☒ No ☐ NA ☐ pH appropriate? Yes ☐ No ☒ NA ☐

Comments: Ph ~7 on 2/2 HCL Ammonia on B6-W-45.

Additional information: TB# 2810

* 1/3 vials have HS on B7-W-25

Labeled by:

Witness:

Cooler Inspected by:

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Philip Nerenberg

Philip Nerenberg, Lab Director

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APPENDIX G

DATA VALIDATION MEMORANDUM



DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. M0350.04.001 | MARCH 8, 2022 | PORT OF SKAMANIA

Maul Foster & Alongi, Inc., conducted an independent stage 2A review of the quality of analytical results for groundwater and soil samples and associated quality control samples collected at the Cascades Business Park on February 9 and 10, 2022.

Apex Laboratories, LLC (Apex), performed the analyses. Apex report number A2B0415 was reviewed. The analyses performed and samples analyzed are listed below. Samples submitted on hold are indicated below.

Analysis	Reference
BTEX compounds	EPA 8260D
Diesel- and oil-range hydrocarbons	NWTPH-Dx
Percent dry weight	EPA 8000D
Polychlorinated biphenyls	EPA 8082A
Polycyclic aromatic hydrocarbons	EPA 8270E/8270E-SIM
Total and dissolved metals	EPA 6020B
NOTES: BTEX = benzene, toluene, ethylbenzene, and xylene. EPA = U.S. Environmental Protection Agency. NWTPH = Northwest Total Petroleum Hydrocarbons. SIM = selective ion monitoring.	

Samples Analyzed		
Report A2B0415		
B6-S-11	B2-S-2.5 (hold)	B5-S-13.5
B6-S-21	B2-S-6	B3-S-3 (hold)
B6-S-31	B2-S-8.5 (hold)	B3-S-5
B6-S-41	B1-S-3 (hold)	B3-S-8 (hold)
B6-S-49.5	B1-S-5.5 (hold)	B14-S-7
B6-W-45	B1-S-8.5	B14-S-9.5
B6-W-45-DUP	B4-S-1 (hold)	NDU-S-0-5
B7-S-11	B4-S-5 (hold)	NDU-S-5-10
B7-S-21	B4-S-8	SDU-S-0-5
B7-S-29.5	B5-S-3 (hold)	SDU-S-5-10
B7-S-35	B5-S-7 (hold)	Trip Blank (hold)
B7-W-25	B5-S-11 (hold)	--

DATA QUALIFICATION

Analytical results were evaluated according to applicable sections of U.S. Environmental Protection Agency (EPA) guidelines for data review (EPA, 2020a,b) and appropriate laboratory- and method-specific guidelines (Apex; 2021; EPA, 1986).

Data validation procedures were modified, as appropriate, to accommodate quality control requirements for methods not specifically addressed by EPA data review procedures (e.g., NWTPH-Dx).

Apex noted that, to minimize matrix interference, EPA Method 8082A samples and associated batch quality control samples were processed with sulfuric acid cleanup by EPA Method 3665A, sulfur cleanup by EPA Method 3660B, and Florisil cleanup by EPA Method 3620B. No action was required.

Apex flagged the NDU-S-0-5, NDU-S-5-10, SDU-S-0-5, and SDU-S-5-10 results as having undergone sample processing prior to extraction and analysis. This was requested by the project manager; thus, no qualifications were necessary.

Total and dissolved metals results were compared. Sample results were qualified if dissolved results were greater than associated total results, except when the relative percent difference (RPD) was less than 20 percent.

Based on the results of the data quality review procedures described below, the data are considered acceptable for their intended use, with the appropriate final data qualifiers assigned. Final data qualifiers represent qualifiers originating from the laboratory and accepted by the reviewer, as well as data qualifiers assigned by the reviewer during validation.

- Final data qualifiers:
 - J = result is estimated.
 - U = result is non-detect at the laboratory detection limit (LDL).
 - UJ = result is non-detect with an estimated LDL.

HOLDING TIMES, PRESERVATION, AND SAMPLE STORAGE

Holding Times

Extractions and analyses were performed within the recommended holding time criteria.

Preservation and Sample Storage

Apex flagged the NWTPH-Dx results from samples B6-W-45, B6-W-45-DUP and B7-W-25 due to incomplete field preservation. The laboratory added additional preservative to adjust the pH after samples were received by the laboratory. The samples were properly preserved within the 7-day method requirement; thus, no qualifications were necessary.

The remaining samples were preserved and stored appropriately.

BLANKS

Method Blanks

Laboratory method blanks are used to assess whether laboratory contamination was introduced during sample preparation and analysis. Laboratory method blank analyses were performed at the required frequencies. For purposes of data qualification, the laboratory method blanks were associated with all samples prepared in the analytical batch.

All laboratory method blank results were non-detect to the LDL for all target analytes.

Equipment Rinse Blanks

Equipment rinse blanks are used to evaluate field equipment decontamination. These blanks were not required for this sampling event, as all samples were collected using dedicated, single-use equipment.

Trip Blanks

Trip blanks are used to evaluate whether volatile organic compound contamination was introduced during sample storage and shipment between the sampling location and the laboratory.

A trip blank (Trip Blank) was submitted on hold with the sample delivery group A2B0415 for EPA Method 8260D analysis.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

A laboratory control sample (LCS) and a laboratory control sample duplicate (LCSD) are spiked with target analytes to provide information about laboratory precision and accuracy. When LCSD results were not reported, batch precision was evaluated with laboratory duplicate results. The LCS samples were extracted and analyzed at the required frequency.

All LCS/LCSD results were within acceptance limits for percent recovery and relative percent difference (RPD).

LABORATORY DUPLICATE RESULTS

Laboratory duplicate results are used to evaluate laboratory precision. All laboratory duplicate samples were extracted and analyzed at the required frequency. Laboratory duplicate results within five times the method reporting limit (MRL) were not evaluated for precision.

Laboratory duplicate RPD control limit exceedances did not require qualification when the duplicate was prepared with samples from unrelated projects because non-project laboratory duplicate sample matrices were not representative of project sample matrices.

All project-related laboratory duplicate results met RPD acceptance criteria.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

Matrix spike/matrix spike duplicate (MS/MSD) results are used to evaluate laboratory precision and accuracy as well as the effect of the sample matrix on sample preparation and analysis. MSDs were not reported with NWTPH-Dx, EPA Method 8260D, EPA Method 8082A, EPA Method 8270E-SIM, EPA Method 8270E, EPA Method 6020B, and EPA Method 8000C.

MS percent recoveries were not evaluated when analyte concentrations were four times the spike amount for inorganic analyses, and five times the spike amount for organic analyses; associated MS percent recovery exceedances were not qualified by the reviewer, because spike concentrations could not be accurately quantified.

MS percent recovery control limit exceedances did not require qualification in cases where the MS had been prepared by the laboratory with samples from unrelated projects, because MS with these sample matrices were not representative of project sample matrices.

Apex noted that the NWTPH-DX batch 22B0534, EPA Method 8082A batch 22B0747, EPA Method 8270E-SIM batch 22B0652, and EPA Method 8270E batch 22B0663 analyses had insufficient sample volume provided to the laboratory for MS analysis; batch precision and/or accuracy was evaluated with LCS/LCSD or laboratory duplicate results. All remaining MS samples were prepared and analyzed at the required frequency.

According to report A2B0415, the EPA Method 6020B batch 22B0563 MS (22B0563-MS1) total mercury result was above the upper percent recovery acceptance limit of 125 percent, at 158 percent. Additionally, the total arsenic and total chromium results were below the lower percent recovery acceptance limit of 75 percent, at 73 percent and 67 percent, respectively. The associated mercury results were non-detect; thus, no qualification was necessary. The associated sample results from the source sample and the associated parent sample have been qualified, as shown in the table below.

Report	Sample	Component	Original Result (ug/L)	Qualified Result (ug/L)
A2B0415	B6-W-45	Total arsenic	62.3	62.3 J
		Total cadmium	2.00 U	2.00 UJ
	B6-W-45-DUP	Total arsenic	116	116 J
		Total cadmium	2.29 J	2.29 J
NOTES: % = percent. J = result is estimated. RPD = relative percent difference. ug/L = micrograms per liter. UJ = result is non-detect with an estimated laboratory detection limit.				

According to report A2B0415, the EPA Method 6020B batch 22B0579 MS (22B0579-MS1) dissolved barium results exceeded the upper percent recovery acceptance limit of 125 percent, at 157 percent. The source sample used to prepare the MS was reported using a result from a different batch; thus, no qualifications were necessary.

All remaining project-related MS results were within acceptance limits for percent recovery and RPD.

SURROGATE RECOVERY RESULTS

The samples were spiked with surrogate compounds to evaluate laboratory performance for individual samples. The laboratory appropriately documented and qualified surrogate outliers. The reviewer took no action based on surrogate percent recoveries that were outside acceptance limits because of dilutions necessary to quantify high concentrations of target analytes present in the samples. The reviewer confirmed that batch quality assurance/quality control results for samples with surrogate outliers were within acceptance limits.

All surrogate results were within percent recovery acceptance limits.

CONTINUING CALIBRATION VERIFICATION RESULTS

Continuing calibration verification (CCV) results are used to demonstrate instrument precision and accuracy through the end of the sample batch. Apex did not include CCV results but flagged results with CCV exceedances and were reviewed when provided.

According to report A2B0415, Apex flagged EPA Method 6020B batch 22B0802 LCS and MS and batch 22B0772 MS as having a high CCV recovery. The associated sample results were non-detect and the quality control samples were within acceptable recovery; thus, no qualifications were necessary.

FIELD DUPLICATE RESULTS

Field duplicate samples measure both field and laboratory precision. According to report A2B0415, the following field duplicate and parent sample pair was submitted for analysis (B6-W-45/ B6-W-45-DUP) Maul Foster Alongi, Inc., uses acceptance criteria of 100 percent RPD for results that are less than five times the MRL, or 50 percent RPD for results that are greater than five times the MRL. Non-detect data are not used in the evaluation of field duplicate results. Field duplicate results that exceeded the acceptance criteria were qualified with a “J,” as estimated, as shown in the table below.

Report	Sample	Component	RPD (%)	Original Result (ug/L)	Qualified Result (ug/L)
A2B0415	B6-W-45	Total arsenic	60.2	62.3	62.3 J
	B6-W-45-DUP			116	116 J
	B6-W-45	Total barium	76.1	1,050	1,050 J
	B6-W-45-DUP			2,340	2,340 J
	B6-W-45	Total chromium	80.1	184	184 J
	B6-W-45-DUP			430	430 J
	B6-W-45	Total lead	82.8	78	78 J
	B6-W-45-DUP			186	186 J
NOTES: % = percent. J = result is estimated. RPD = relative percent difference. ug/L = micrograms per liter.					

All remaining field duplicate results met the RPD acceptance criteria.

REPORTING LIMITS

Apex used LDLs for non-detect results, except for samples requiring dilutions because of high concentrations, coeluting analytes, and/or matrix interferences. Results between the LDL and the MRL were qualified by Apex with “J,” as estimated.

The reviewer confirmed that EPA Method 6020B soil results were reported with a base dilution factor of 1:10 due to a dilution required for analysis.

The reviewer confirmed that EPA Method 8260D soil results were reported with a base dilution factor of 1:50 due to a dilution required for analysis.

The reviewer confirmed that specific EPA Method 6020B sample results had elevated reporting limits due to due to preparation and/or analytical dilution necessary for analysis and no qualifications were necessary.

DATA PACKAGE

The data package was reviewed for transcription errors, omissions, and anomalies.

Apex noted that one of the three volatile organic analysis (VOA) vials read “B7-W-” rather than “B7-W-25.” Additionally, there was no sample information on the field-filtered nitric-acid preserved bottle for sample “B6-W-45-DUP.” The laboratory notified the project manager, and the nomenclature issues were resolved before the samples were analyzed. No further action was required by the reviewer.

Apex noted that there was sediment in all VOA vials and that two of the three VOA vials from sample B6-W-45-DUP had head space and one of the three VOA vials from sample B-7-W-25 had head space. The reviewer confirmed with the laboratory that the vial analyzed for each of these samples had no headspace; thus, no additional actions were necessary.

No additional issues were found.

REFERENCES

Apex. 2021. Quality systems manual. Revision 9. Apex Laboratories, LLC. Tigard, Oregon. January 1.

EPA. 1986. Test methods for evaluating solid waste, physical/chemical methods. EPA publication SW-846. 3d ed. U.S. Environmental Protection Agency. Final updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), V (2015), VI phase I (2017), VI phase II (2018), VI phase III (2019).

EPA. 2020a. EPA contract laboratory program, national functional guidelines for inorganic Superfund methods data review. EPA 542-R-20-006. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. November.

EPA. 2020b. EPA contract laboratory program, national functional guidelines for organic Superfund methods data review. EPA 540-R-20-005. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. November.

APPENDIX H

95 UCL CALCULATION FOR ARSENIC IN SOIL



Compliance calculations - MTCASat 97

As concentration

(mg/kg) Sample name

10.2 B1-S-8.5 95 UCL calculation for arsenic in soil for Cascades Business Park (VCP SW1740)

7.64 B2-S-6

23.1 B3-S-5

27.3 B4-S-8

6.68 B5-S-13.5

5.29 B6-S-11

2.21 B6-S-21

1.45 B6-S-31

4.23 B6-S-41

3.87 B6-S-49.5

4.6 B7-S-11

4.07 B7-S-21

7.18 B7-S-29.5

5.41 B7-S-35

4.04 B14-S-7

1.56 B14-S-9.5

5.58 NDU-S-0-5

7.45 NDU-S-5-10

5.98 SDU-S-0-5

4.83 SDU-S-5-10

Number of samples		Uncensored values	
Uncensored	20	Mean	7.13
Censored		Lognormal mean	7.06
Detection limit or PQL		Std. devn.	6.56571981
Method detection limit		Median	5.35
TOTAL	20	Min.	1.45
		Max.	27.3

Lognormal distribution?	Normal distribution?
r-squared is: 0.923	r-squared is: 0.652

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 10.2412477807476