ENVIRONMENTAL AND GEOTECHNICAL ASSESSMENT REPORT OF FINDINGS

Lignin Parcel, GP West Site
Bellingham, Washington

Prepared for: RMC Architects LLC and Port of Bellingham

Project No. 190239-001-1.4 • November 24, 2020 FINAL

Prepared under Integrated Planning Grant Agreement No. TCPIPG-1921-BellPo-00001

Aspect CONSULTING

earth + water

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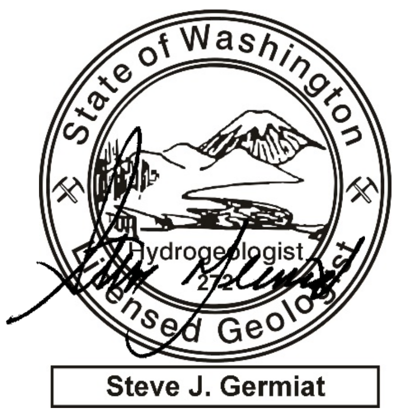

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Project Contacts

This Report of Findings is prepared in accordance with Integrated Planning Grant Agreement No. TCPIPG-1921-BellPo-00001 between the Washington State Department of Ecology and the Port of Bellingham. Contacts for the Integrated Planning Grant Project are as follows:

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1 Project Overview and Goal for Assessment

In early 2019, the Washington State Department of Ecology (Ecology) selected the Port of Bellingham (Port) as a recipient of a Toxics Cleanup Healthy Housing Integrated Planning Grant (IPG) to fund early project planning efforts for the approximately 3-acre Lignin Parcel located at the corner of Cornwall and Laurel Streets within the Bellingham Waterfront District (Figure 1). The Lignin Parcel is part of the former Georgia-Pacific mill property, which is now the Georgia-Pacific West (GP West) cleanup site (Site) that requires remediation under the Model Toxics Control Act (MTCA) prior to redevelopment. The Port has been conducting environmental investigation and remediation at the Site since 2009 under legal agreements with Ecology.

For the past year, the Port has been working with a local development partner (Millworks, LLC) to evaluate the feasibility of a food campus and affordable/workforce housing at the Lignin Parcel. The Millworks group envisions a campus setting that includes food retail, processing and manufacturing, aggregation and distribution as well as commercial kitchen space supporting catering and artisanal food companies. Also anticipated on the Parcel is a multi-story mixed-use building with offices, classrooms, community event space, and workforce affordable housing. The project fits with the overall community goals of reactivation of the Site while providing much needed affordable housing.

The Port is using the IPG to advance the Millworks redevelopment concept by completing focused environmental investigations, site surveys, coordination with development partners and community stakeholders, and parcel layout/programming.

Task 1 of the IPG included focused environmental assessment, geotechnical/geophysical investigation, and Parcel-specific survey with the goal of advancing environmental and geotechnical characterization of the Lignin Parcel in preparation for redevelopment for affordable housing and other intended uses. A Work Plan for the Environmental and Geotechnical Assessment (Work Plan; Aspect Consulting [Aspect], 2020) was reviewed and approved by Ecology and describes the scope work for the Task 1 environmental and geotechnical assessments completed.

The subsequent sections of this Report are as follows:

- **Section 2** – Background for Lignin Parcel
- **Section 3** – Environmental Assessment Findings
- **Section 4** – Geotechnical Assessment Findings
- **Section 5** – References cited in this Report

2 Background for Lignin Parcel

The approximately 3-acre Lignin Parcel is located within the 36-acre Chlor-Alkali Remedial Action Unit (RAU) of the GP West cleanup Site. The 3 acres is part of the Reserve Tract of the Waterfront Binding Site Plan and is currently not an independent tax parcel; however, the Port may create a parcel or parcels encompassing the area on a subsequent Specific Binding Site Plan, and the term Lignin Parcel is applied to the subject property in this Report. Figure 2 shows the extents of the Lignin Parcel, including the former Lignin Warehouse structure that was demolished in May 2020, along with the subsurface explorations relied upon for the environmental and geotechnical assessments in this Report.

2.1 Industrial History

In 1926, the San Juan Pulp Company opened the first pulp mill on 5 acres of filled tideland adjacent to Bellingham Bay. It was designed to make use of pulp logs and fiber leftovers from a local wood box plant and several lumber mills. Three years later, the business was reorganized as the Puget Sound Pulp and Timber Company. In 1958, Puget Sound Pulp and Timber acquired the adjacent tissue manufacturing operations of Pacific Coast Paper Mills. In 1963, the company merged with the Georgia-Pacific Corporation who owned and operated the mill until the Port acquired it in 2005. Georgia-Pacific operated the pulp mill until 2001 and, under lease to the Port, operated the tissue mill until 2007.

The Georgia-Pacific mill manufactured bleached sulfite pulp for internal production of tissue and toweling, and for sale as market pulp. The mill contained six individual plants producing primarily sulfite pulp, Permachem pulp, sulfuric acid, chlorine, sodium hydroxide, alcohol, and lignosulfonate products. Lignin materials produced as biproducts in the pulping process were converted through various production steps into commercial products including chromium-containing oil-well drilling mud thinners, vanilla flavoring, animal feeds, adhesives, pharmaceuticals, dust retardants, fuel pellets, solvents, ferromagnetic liquids, and many other products.

On the Lignin Parcel, the lignin warehouse[1] (warehouse) was used for storage of the manufactured lignin-containing products. Waste liquors from the lignin processes were stored in a series of above-ground storage tanks ranging size from 30,000 to 150,000 gallons located on the western portion of the Parcel. Although materials containing hexavalent chromium were used in manufacture of lignin-based drilling mud products, all handling of those materials occurred within the Lignin Plant area north of the BNSF railroad (Aspect, 2004); there is no evidence for storage of materials containing hexavalent chromium on the Lignin Parcel, and the existing environmental sampling and analysis data from the Parcel (described below) are consistent with that.

[1] The lignin warehouse was demolished in May 2020.

2.2 Previous Subsurface Investigations

2.2.1 Prior Environmental Investigation

Prior to the Port's purchase of the entire Site, Georgia-Pacific completed a Phase 2 Environmental Site Assessment (ESA) for the Pulp and Tissue Mill portion of the Site. The Phase 2 ESA included soil and groundwater sampling and analysis on the Lignin Parcel[2] to evaluate potential impacts associated with the spillage of dry lignin products and/or waste liquor during historical loading of rail cars and/or release of lignin products from the overhead conveyor between the warehouse and rail spur (Aspect, 2004).

The 2004 characterization of the Lignin Parcel included drilling soil borings to a depth of approximately 15 feet with soil sampling to a maximum depth of 8 feet at five locations, and collection of four surface soil samples. These explorations were designated LW-SB01 through LW-SB06 (soil borings), LW-MW01 (monitoring well), and LW-SS01 through LW-SS04 (surface samples) at the locations shown on Figure 2. Boring LW-MW01 was located within the waste liquor tank area and was also completed as a groundwater monitoring well positioned near the downgradient (western) edge of the Parcel. Boring LW-SB01 was located south of the warehouse, and LW-SB02 was located adjacent to its western entrance. Borings LW-SB03 and LW-SB04 were located adjacent to the warehouse's northwestern and northern edges, in the vicinity of the conveyor and dry product storage tanks. Surface soil samples LW-SS01, LW-SS02, and LW-SS03 were collected along the rail spur located west of the warehouse (spillage of dry products was reported in this area by former Georgia-Pacific employees), and surface soil sample LW-SS04 was collected in the northeastern corner rail entrance (Figure 1).

In total, 14 soil samples were analyzed for total metals including hexavalent chromium, and semivolatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs). One sample from each boring and the four surface soil samples were also analyzed for formaldehyde. Had field evidence of hydrocarbon or volatile organic compound (VOC) contamination been observed during soil sample collection, the corresponding soil samples would have been also tested for total petroleum hydrocarbons (TPH, in the gasoline, diesel, and oil ranges), VOCs, and, if heavy oil was suspected, for polychlorinated biphenyls (PCBs). No field screening indications of hydrocarbons/VOCs was observed during the sampling, so these additional analyses were not performed (Aspect, 2004). Table 1 includes the 2004 soil quality data.

The 2004 characterization also included installation and groundwater sampling of monitoring well LW-MW01. The groundwater sample was analyzed for metals, SVOCs including PAHs, VOCs, PCBs, and a range of conventional parameters. Following the Port's acquisition of the property from Georgia-Pacific in 2005, groundwater samples were collected from well LW-MW01 for metals analysis in September 2009 and March 2010 as part of the Port's Remedial Investigation (RI) for the Site. Table 2 presents the groundwater quality data for the Lignin Parcel.

[2] Termed the Lignin Warehouse site (Mill B) in Aspect (2004).

2.2.2 Prior Geotechnical Investigation

A geotechnical engineering study (GeoEngineers, 2007) was completed in support of a potential relocation of the BNSF railroad main line traversing the Site along the western edge of the Lignin Parcel. As part of that study, three geotechnical soil borings—designated BB-1, BRR-1, and BRR-2 (Figure 2)—were drilled on the Lignin Parcel. These borings encountered, from the surface down: fill, beach/intertidal deposits, and Chuckanut formation (bedrock). The geologically unconsolidated fill and beach/intertidal deposits are generally unsuitable for foundation support for a new building; the underlying Chuckanut formation is competent and suitable for foundation support. The reported depths below ground surface to the top of the Chuckanut formation varied from 20.5, 29, and 46.5 feet, in BRR-1, BRR-2, and BB-1, respectively.

2.3 Subsurface Conditions

This section describes the current understanding of the geologic and groundwater conditions underlying the Lignin Parcel based on the prior and current investigations.

2.3.1 Geology

Material underlying the Lignin Parcel is characterized by fill placed over a wedge of unconsolidated materials all overlying the generally southward-sloping bedrock surface, as described below.

Fill

Geologic mapping of the Site indicate it is underlain by artificial fill (Lapen, 2000). The entirety of the Site including the Lignin Parcel was built on land formed by historical filling of a tidal flat area of the Whatcom Creek Delta starting in the early 1900s. The fill material comprising the Lignin Parcel primarily includes dredge fill placed hydraulically during 1912 and 1913 by the U.S. Army Corps of Engineers.

Fill material observed during the exploration activities consists primarily of silty sand (SM) with variable gravel and fines contents. Fragments of debris consisting of woody material or bricks were commonly encountered within the fill. The collective explorations indicate fill material extending to depths of about 5 to 12 feet below the ground surface (bgs) across the Parcel, corresponding to approximate elevation 8 to 13 feet above the North American Vertical Datum of 1988 (NAVD88).

The fill material has low shear strength, high compressibility, moderate hydraulic conductivity, and is susceptible to liquefaction.

Beach/Intertidal Deposits

Underlying the fill is a sequence of native marine beach/intertidal deposits ranging from about 10 to more than 35 feet thick. The beach/intertidal deposits generally consist of very loose to loose, sand (SP) or silty sand (SM) and commonly stratified with clay, sandy clay, or gravelly clay (CL). Our current assessment's 15-foot-deep explorations terminated in these deposits.

Beach/Intertidal deposits have low shear strength, moderate compressibility, low to moderate hydraulic conductivity, and are susceptible to liquefaction.

Chuckanut Formation Bedrock

The unconsolidated soil units pinch out to the north and east of the Lignin Parcel to bedrock of the Chuckanut formation consisting of sandstone, shale, conglomerate, and coal (GeoEngineers, 2007; Lapen, 2000). Bedrock was not encountered by the termination depth (15-feet bgs) during the current assessment exploration activities.

GeoEngineers (2007) describes the Chuckanut formation bedrock encountered within the vicinity of the Lignin Parcel to consist of weathered sandstone that varied from friable decomposed rock to a less decomposed, sound rock. GeoEngineers (2007) stated that the bedrock could be drilled with a mud-rotary tri-cone bit; however, it was difficult to penetrate using a hollow-stem-auger drill rig. To our knowledge, rock-coring methods of explorations have not been conducted in the vicinity of the Lignin Parcel.

Bedrock surface elevations were estimated across the Lignin Parcel based on previous mapping by W.D. Purnell and Associates (1977) and supplemented by boring data from GeoEngineers (2007). Figure 3 presents the currently estimated bedrock surface elevation contours for the Lignin Parcel area using the collective information. The bedrock surface is estimated to be at a maximum elevation of around -5 feet NAVD88 in the northern portion of the Site and a minimum elevation of around -40 feet NAVD88 in the southern portion of the Parcel. These elevations correspond to depths of about 20 feet bgs in the northern portion and about 50 feet bgs in the southern portion of the Parcel, indicating a steep southwestward-sloping bedrock surface. Purnell (1977) maps the bedrock surface diving to an elevation below -120 feet NAVD88 (depths of 140+ feet bgs) approximately 400 to 500 feet southwest of the Lignin Parcel.

The Chuckanut formation typically has little primary porosity and limited groundwater movement through fractures. Chuckanut formation bedrock has high shear strength, very low compressibility, and is not susceptible to liquefaction.

2.3.2 Groundwater Conditions

Across the broader Site, the three hydrostratigraphic units of primary interest include, from surface down: the Fill Unit, a low-permeability Aquitard representing the historical tide flat surface that fill was placed upon, and a deeper sand unit under artesian conditions referred to as the Lower Sand Unit (Aspect, 2013). Within the Lignin Parcel, the Beach-Intertidal deposits lacked a consistent silty (low-permeability) horizon and it does not appear that an aquitard unit exists beneath the fill across the entire Parcel.

During the current exploration activities in early August 2020 (dry season), groundwater was measured at depths ranging from about 3 to 10 feet bgs, representing a water table elevation of about 10 to 13 feet NAVD88. At monitoring well LW-MW01, located along the western boundary of the Lignin Parcel (Figure 2), depth to the water table ranged between 4.2 and 5.6 feet bgs (elevations 9.9 to 11.3 feet NAVD88) when measured in 2004, 2009, and 2010. During the August 2020 field data collection, depth to water was measured at 6.5 feet bgs in LW-MW01 (elevation 9.0 feet NAVD88), confirming the dry-season condition. The water table depth is expected to be shallower along the eastern and northeastern sides of the Parcel. Groundwater in the Fill Unit and underlying unconsolidated deposits flows generally westward with discharge to the Whatcom Waterway.

3 Environmental Assessment Findings

This section describes the supplemental environmental soil sampling and analysis conducted under the IPG and then, integrating the new and prior data, the updated understanding of contaminant conditions for Lignin Parcel soil and groundwater.

3.1 Supplemental Sampling and Analysis Conducted

In accordance with the Work Plan, supplemental soil sampling and analysis was conducted from six direct-push soil borings to a depth of 15 feet on August 3, 2020. No groundwater sampling was conducted in this environmental assessment, with the expectation that groundwater monitored natural attenuation (MNA) performance monitoring will be conducted for the Lignin Parcel in accordance with a monitoring plan to be developed and approved by Ecology following finalization of the Chlor-Alkali RAU CAP.

The assessment's six new soil borings (LW-SB101 through LW-SB106) included two advanced through the floor slab of the former warehouse and four outside of it at locations depicted on Figure 2. The soil borings were completed by a state-licensed resource-protection well driller from Cascade Drilling of Woodinville, Washington. A state-licensed geologist from Aspect conducted geologic logging and soil sampling for the borings. In accordance with the Work Plan's Inadvertent Discovery Plan (IDP), Aspect's geologist watched for indications of potential archaeological materials during logging of the soil cores. No such materials were observed. Appendix A includes boring logs for the six new borings.

At each of the six boring locations, a surface soil sample was collected from the upper 1-foot interval beneath pavement/floor slab grade. There were no field screening[3] indications of contamination in any of the borings; therefore, deeper soil samples were collected from each boring from just below the water table observed during drilling and at a depth approximately 3 to 4 feet below the water table.

The soil samples were submitted to OnSite Environmental in Redmond, Washington, an Ecology-accredited analytical laboratory, for analysis of the following constituents that had exceedances of cleanup levels in soil during the prior sampling on the Parcel:

- Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc)
- Polycyclic aromatic hydrocarbons (PAHs)
- Diesel-/oil-range total petroleum hydrocarbons (TPH)

The environmental sampling and analysis were performed in accordance with the Work Plan's Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) (Aspect, 2020). Aspect's field geologist also conducted the field work in accordance with

[3] Visual and olfactory observations, and photoionization detector (PID) readings, as described in the Work Plan's Sampling and Analysis Plan (Appendix A in Aspect, 2020).

Aspect's site-specific Health and Safety Plan that included hygiene and social distancing protocols specific to COVID-19.

3.2 Soil Quality within Lignin Parcel

The Lignin Parcel soil contaminant conditions are evaluated relative to soil cleanup levels established in Ecology's Draft Cleanup Action Plan (DCAP) for the Chlor-Alkali RAU that encompasses the Parcel (Ecology, 2020). The soil cleanup levels are for an unrestricted land use, which assume a residential child lifetime direct contact exposure and account for contaminant leaching to groundwater. Table 1 presents the collective Parcel soil data compared against cleanup levels, with shading of detected concentrations exceeding cleanup levels. The DCAP has yet to go through public comment and be finalized, and there is a small chance that the cleanup levels could change in that process.

Contaminants exceeding cleanup levels in Lignin Parcel soil include carcinogenic polycyclic aromatic hydrocarbons (cPAHs), selected metals, and, in shallow soil at the LW-SB01 location, soil pH. Concentrations of semivolatile organic compounds (SVOCs) other than cPAHs and of formaldehyde were less than respective soil cleanup levels in each of the 15 historical soil samples collected.

Diesel- and oil-range TPH concentrations were also below the cleanup level in each of the 18 soil samples collected in August 2020 (Table 1). However, TPH was detected in surface soil samples at three of the six boring locations—LW-SB102 (801 mg/kg[4]), LW-SB104 (199 mg/kg), and LW-SB104 (76 mg/kg)—and in the 10-foot soil sample collected from boring LW-SB104 (95 mg/kg), which would restrict options for potential reuse of the soil if excavated as per Ecology guidance (Ecology, 2016).

Figure 4 shows the spatial distribution of locations with detected cPAH and metals concentrations exceeding soil cleanup levels, as described briefly below.

3.2.1 cPAHs

Total cPAH (TEQ[5]) concentrations exceeding the cleanup level were detected in soil samples collected around the former warehouse on the west and north sides (0.8 to 29 mg/kg) and on the south side (0.47 mg/kg). cPAH concentrations in soils collected beneath the former warehouse floor slab were less than the cleanup level. Based on the current data, Figure 4 depicts the estimated extent of cPAH-contaminated soils within the Lignin Parcel.

The highest cPAH concentrations occur in shallow soils adjacent to the former railroad spur on the west side of the former warehouse and are attributable to creosote-treated railroad ties on the spur. The only sample location for which cPAHs exceeded the soil

[4] Reported TPH concentrations are the summation of diesel- and oil-range concentrations in accordance with Ecology policy.
[5] Total toxic equivalent concentration of benzo(a)pyrene calculated in accordance with MTCA (WAC 173-340-708(e)).

cleanup level at a depth greater than 4 feet was LW-SB03 located near the northwest corner of the former warehouse (1.0 mg/kg in the 4-to-8-foot-depth sample; Table 1).

The soil cleanup level for total cPAHs (TEQ) (0.19 mg/kg) in unsaturated and saturated soils[6] is based on human direct contact with soils.[7] The detected cPAHs in some soil samples also exceed higher concentrations predicted to pose a risk via leaching to groundwater (6.2 mg/kg for unsaturated soil, 0.31 mg/kg for saturated soil; Aspect, 2013). However, cPAHs are hydrophobic compounds with low solubility and mobility in the environment, particularly in soils with relatively high organic carbon content as exist beneath the Lignin Parcel. Consistent with those characteristics, cPAHs were not detected in the groundwater samples collected from monitoring well LW-MW01 located along the Parcel's western boundary (Table 2), suggesting that the cPAH concentrations in soil are protective of groundwater in accordance with MTCA (WAC 173-340-747(9)).

3.2.2 Metals

The heavy metals[8] cadmium, chromium, copper, lead, nickel, and zinc were detected in one or more soil samples at concentrations exceeding respective soil cleanup levels, all of which are based on soil leaching to groundwater (not direct contact[9]). Most locations sampled have an exceedance of one or more metals as indicated on Figure 4. Of the various metals, copper and zinc have the most widespread exceedances. Concentrations of copper and zinc are commonly elevated in urban soils as a result of vehicle traffic (copper in brake pads, zinc in tires) as well as building materials (copper in plumbing and wiring, zinc in galvanized metal).

Copper concentrations exceeding the 36 mg/kg soil cleanup level were detected at 10 of the 14 sample locations. Copper concentrations greater than two times the cleanup level (72 mg/kg) were limited to surface soils at two locations: LW-SS02 on the west side of the former warehouse (88 mg/kg) and LW-SB106 within its footprint (650 mg/kg).

Zinc concentrations exceeding soil cleanup levels (100 mg/kg for unsaturated soil; 85 mg/kg for saturated soil) were detected at 7 of the 14 sample locations, with concentrations greater than 200 mg/kg limited to shallow soils (Table 1). The maximum concentration (1,450 mg/kg) occurred in surface soil at LW-SS04 located adjacent to the former warehouse's northern edge (Figure 4).

The other soil metals exceedances—cadmium, chromium, nickel, and lead—are collocated with copper and/or zinc exceedances in shallow soil, except for the cadmium exceedance (11 mg/kg) in shallow soil at the LW-MW01 location (Table 1).

[6] Unsaturated and saturated soils occur above and below, respectively, the groundwater table.
[7] Soil cleanup levels based on direct contact apply to a depth of 15 feet as per MTCA.
[8] The soil metals analyses were run by EPA Method 6010 whereas the Work Plan Quality Assurance Project Plan indicated EPA Method 200.8 as the method. Method 200.8 is for water matrices and was an error in the Work Plan.
[9] Soil concentrations protective of groundwater for the metals cadmium, hexavalent chromium, copper, nickel and zinc (saturated soil only) are calculated/predicted to be below natural background soil concentrations and thus are set at natural background in accordance with MTCA.

As stated above, all of the soil cleanup levels for metals are based on soil leaching to groundwater. As discussed in Section 3.3, chromium was the only metal detected in Lignin Parcel groundwater at concentrations exceeding groundwater cleanup levels during the GP West Site RI sampling (Aspect, 2013), suggesting that the concentrations of metals other than chromium in Lignin Parcel soil are protective of groundwater in accordance with MTCA (WAC 173-340-747(9)).

3.3 Groundwater Quality within the Lignin Parcel

During the 2004 groundwater sampling of well LW-MW01, TPH, PAHs, other SVOCs, VOCs, PCBs were generally not detected, and the concentrations detected were less than screening levels applied in the RI (Aspect, 2013). However, each of the heavy metals analyzed in the groundwater sample exceeded cleanup levels.[10] The 2009-2010 groundwater data from well LW-MW01 showed substantial improvement in metals concentrations relative to 2004; however, total chromium exceedances persisted (Table 2).

Groundwater pH at LW-MW01 also showed a substantial decline between 2004 and 2009-2010, but the 2010 measurement (pH = 8.9) was slightly above the pH 8.5 cleanup level. The slightly higher dissolved oxygen and lower temperature measured at the well in Spring 2010 versus Fall 2009 is likely indicative of cooler, more oxygen-rich recharge infiltrating to the Fill Unit groundwater during the intervening wet season (Table 2).

3.4 Cleanup Action Planning for the Lignin Parcel

Ecology's DCAP for the Chlor-Alkali RAU includes a cleanup action that addresses the full 36 acres including the 3-acre Lignin Parcel (Ecology, 2020). The DCAP focuses on the RAU's primary contaminant of concern—highly concentrated mercury in the area of Georgia-Pacific's historical chlorine plant located more than 1,000 feet south of the Lignin Parcel. The Lignin Parcel has not been impacted by mercury contamination from the former chlorine plant operations.

The DCAP's selected cleanup action for the Lignin Parcel currently includes two primary elements:

- Capping (containment) of the cPAH-contaminated soil on the west side of the former warehouse
- Groundwater monitoring in well LW-MW01 to document performance for the natural attenuation of residual alkaline pH and associated dissolved metals concentrations in achieving cleanup levels

Because the proposed cleanup action would contain contaminated materials throughout the RAU, an environmental covenant would be placed on the RAU including the Lignin Parcel. The covenant, similar to that in place now on the Pulp and Tissue Mill RAU

[10] The reporting limit for hexavalent chromium was elevated (Aspect, 2004), but subsequent samples collected in 2009 and 2010 confirmed no concentrations above the cleanup level (Table 2).

immediately to the northwest of the Parcel, would require inspection and maintenance of the environmental cap in perpetuity.

At the time the DCAP was originally developed, there was not a defined project in the vicinity of the Lignin Parcel. Now that planning for a mixed use redevelopment of the Lignin Parcel, including residential use, is in process, the Port and Ecology can formulate a parcel-specific strategy for integrating cleanup and redevelopment of the Lignin Parcel, to optimize protectiveness for the future use and cost-effectiveness. For example, depending on the earthwork concepts for the redevelopment, it may prove to be more practicable to remove the cPAH-contaminated soils, which occur at shallow depth, during redevelopment instead of capping it as currently contemplated under the RAU's DCAP. Removal of contaminated soil could be accomplished most cost effectively when the redevelopment earthwork is occurring, so that efficiencies with site excavation, backfill, and final grading could be realized. Removing instead of capping the contaminated soils would increase the permanence of the RAU's cleanup remedy and have an added benefit of limiting long-term institutional controls on the Lignin Parcel. However, changing from soil containment to removal would represent a change to the RAU's current DCAP and thus would require close coordination with Ecology as the redevelopment project's planning progresses. It would also require design-level soil sampling to more precisely delineate the extent of cPAH-contaminated soils.

At the time of this Report, Ecology is preparing the DCAP for public comment in accordance with MTCA. Ecology will then address public comments and issue a final CAP. Thereafter, the Port will conduct remedial design for the selected cleanup action, including pre-remedial design investigations (PRDI) to refine design parameters and inform constructability for cleanup of the mercury-contaminated areas of the RAU. The design process will involve preparation of PRDI Work Plan(s), PRDI Data Report(s), Engineering Design Report(s), and Construction Plans and Specifications for the Port's competitive bidding and contracting of the construction elements of the selected cleanup action, which may be divided into multiple projects for contracting and execution. The remedial design is anticipated to be a multi-year process culminating in a Consent Decree between Ecology and the Port that requires completion of the final cleanup action design.

It may be possible to complete remediation of the Lignin Parcel with a process separate from the more involved mercury cleanup activities within the Chlor-Alkali RAU. This potentially could include defining the Lignin Parcel as its own RAU within the GP West Site, subject to agreement with Ecology and appropriate legal documentation.

4 Geotechnical Assessment Findings

This section presents preliminary geotechnical design and construction considerations for the redevelopment concept. Our main conclusions and recommendations include:

- The Site is underlain by weak and compressible fill and beach deposits that range between 20 and 47 feet in thickness where explored. These weak and compressible deposits are underlain by competent Chuckanut formation bedrock. Below the groundwater level, the loose fill and beach deposits are susceptible to liquefaction-triggered strength loss and associated permanent ground deformation during a design-level earthquake. To mitigate these hazards, we recommend the new buildings either be supported on deep foundations that penetrate the fill and beach deposits and reach the underlying bedrock or be constructed over improved ground. Depending on serviceability requirements, at-grade floor slabs may also need to be structurally supported or built over improved ground.

- We understand that building concepts do not presently include below-grade parking or basement areas, but this could change. If basements are to be added, the design would need to consider the relatively shallow depth to groundwater (approximately 5 feet). A relatively water-tight basement could be constructed utilizing with interlocking steel sheet piling basement walls with welded interlocking joints, and a buoyancy-compensated concrete floor slab with waterproofing admixtures. Temporary shoring and dewatering would be needed during construction.

4.1 Seismic Hazards

The Site is located in a seismically active region and will experience strong ground shaking during earthquakes. New buildings will be designed to account for the effects of earthquake ground shaking in accordance with the current applicable codes.

4.1.1 Liquefaction

Liquefaction occurs when loose, saturated, and relatively cohesionless soil deposits temporarily lose strength and stiffness as a result of earthquake shaking. Primary factors controlling the triggering of liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soils, *in situ* stress conditions, and the depth to groundwater.

The loose, saturated granular deposits underlying this Site could liquefy during a design-level earthquake. Potential effects of soil liquefaction include temporary reduction of shallow foundation bearing capacity, downdrag loads on deep foundations, vertical ground settlement, and permanent lateral ground movement. Liquefaction-induced permanent ground deformation could range from several inches to a couple of feet and would vary across the Site due to the varying thickness of the liquefiable fill and beach deposits. This hazard will need to be fully evaluated during the detailed building design phase.

4.1.2 Ground Response

Based on the presence of potentially liquefiable soils, we preliminarily designate the Site as seismic Site Class F in accordance with the 2018 International Building Code (IBC; ICC, 2018) and American Society of Civil Engineers (ASCE) 7-16, *Minimum Design Loads for Buildings and Other Structures Loads* (ASCE, 2017). For a Site Class F site, a site-specific ground response analysis is required. However, if a building on a Site Class F site has a fundamental period less than 0.5 seconds, the code allows for a Site Class E designation in lieu of a site-specific ground response analysis.

Our recent experience is that buildings greater than five stories tall may have fundamental periods of vibration greater than 0.5 seconds. If ground improvement below a building is used to mitigate liquefaction triggering, then the Site can be designated Site Class D. Geotechnical and structural engineering coordination will be needed to assess seismic risk during the detailed design phase of the project.

4.2 Building Foundations and Floor Slabs

The loose fill and beach deposits underlying the Site are compressible and susceptible to liquefaction. Grade-supported buildings over these soils will have a high potential for settlement under static loads and would likely sustain significant damage (or could even collapse) due to soil liquefaction during design-level earthquake ground shaking. Multi-story (three or more levels) buildings should be supported on deep foundations. Single- to two-story buildings could be supported similarly, or on rafted structural slabs combined with ground improvement.

The suitability of deep foundations vs. shallow foundations over improved ground will depend on building loads and performance requirements.

4.2.1 Deep Foundations

Deep foundations that bypass the fill and beach deposits and transfer loads to the underlying bedrock can be utilized to support new buildings. Deep foundations will not mitigate liquefaction triggering, but rather they will mitigate the effects of liquefaction (building settlement). The deep foundation design would need to consider liquefaction-induced downdrag loads imposed on the foundations by the surrounding settling soil.

In our opinion, there are several types of deep foundation systems that may be suitable for the Site considering the anticipated building sizes. These systems include driven piles, driven grout piles, and auger-cast piles.

Suitable types of driven piles include open or closed-end steel pipe piles or driven H-piles. Two benefits of driven piles are that they do not produce spoils and their capacities can be measured in the field during driving. Closed-end pipe piles can also be inspected for damage during or following driving. One potential disadvantage of displacement piles (such as closed-end steel pipe piles) at this Site is that pile driving “refusal” conditions will likely develop within about one or two pile diameters of the top of the Chuckanut formation. Where the depth to bedrock is less than about 25 feet, displacement piles may not be deep enough to develop lateral fixity. Open-end pipe piles will develop a soil plug that will tend to act like a closed end; however, a drilling and driving technique can be employed to disturb soil ahead of the pile tip to make for easier driving, and to remove soil and prevent a plug from developing. Low-displacement H-piles will develop a greater embedment depth into the Chuckanut formation. Pile driving will generate noise and vibrations, which we do not anticipate to be a major concern at this Site.

Driven grout piles are proprietary ‘hybrid’ deep foundation system installed by a regional contractor. Driven grout piles are installed by 1) driving a displacement mandrel through the subsurface to the design depth or specified driving resistance and 2) retracting the mandrel while pumping grout to create a grout-filled shaft. Reinforcement (typically a rebar cage) is then wet-set into the freshly grouted shaft. Similar to a driven displacement pile, driven grout piles will likely meet with “refusal” conditions very close to the top of the Chuckanut formation.

Auger-cast piles are constructed by rotating a continuous flight of hollow-stem auger to a specified depth. Once the specified depth is reached, grout is pumped through the hollow stem as the auger is slowly withdrawn, creating a column of grout. Steel reinforcement is then wet-set into the freshly grouted column. One advantage of auger-cast piles is that the auger will likely achieve greater penetration into the Chuckanut formation, compared to displacement piles. Potential disadvantages of auger-cast piles are 1) they will produce spoils that will have to be dealt with; 2) their axial compressive capacities cannot be verified during installation; and 3) their quality is highly dependent on the skill and experience of the contractor.

For planning purposes, we estimate that deep foundation lengths will vary between about 25 and 50 feet in length, with pile lengths increasing from northeast to southwest across the Site. A summary of the advantages and disadvantages of the deep foundations discussed above are presented in Table 3 below.

Table 3. Advantages and Disadvantages of Various Deep Foundation Systems

Deep Foundation System	Advantages	Disadvantages
Driven displacement piles (i.e., closed-end steel pipe piles)	Densifies soil during driving; spoils are not produced; pile capacity can be verified during driving; piles can be inspected for damage	We likely meet with driving refusal at the top of the Chuckanut formation; pile driving produces noise and vibration
Driven open-end steel pipe piles	Open ended pipe piles can be socketed into the Chuckanut formation with a drill-and-drive operation; pile capacity can be verified during driving	Drill and drive operation will produce spoils; pile driving produces noise and vibration
Driven H-piles	Can potentially penetrate into Chuckanut formation; spoils are not produced; pile capacity can be verified during driving	Pile driving produces noise and vibration
Driven Grout Piles	Densifies soil during driving; spoils are not produced; pile capacity can be verified during driving	Will likely meet driving refusal at the top of the Chuckanut formation; pile driving produces noise and vibration
Auger-cast piles	Auger can be advanced into the Chuckanut formation	Produces spoils; quality is dependent on contractor skill and experience; capacity cannot be verified during installation

4.2.2 Ground Improvement

Shallow foundations and/or rafted slabs combined with ground improvement will be feasible for lighter buildings (1 or 2 stories) at the Site. Ground improvement consists of modifying weak or marginal *in-situ* soils to create a stiffer soil mass with improved engineering characteristics, such as higher bearing capacity, lower compressibility under loads, and reduced liquefaction susceptibility. Ground improvement is typically achieved through densification and/or replacing a portion of the *in-situ* soils with stiffer materials. In our opinion, the subsurface conditions may be suitable for ground improvement using stone columns or rammed aggregate piers (RAPs).

Stone columns and RAPs consist of columns of compacted angular crushed rock installed within a soil mass. The stone columns/RAPs are typically 20 to 36 inches in diameter and are installed by vibrating a mandrel or probe through the subsurface to the desired depth. Once the desired depth is reached, the mandrel/probe is retracted as crushed rock is injected and compacted in lifts.

If installed on close enough spacing, the stone columns/RAPs can effectively mitigate liquefaction triggering because 1) they densify the surrounding soil; 2) the columns themselves are not liquefiable; and 3) the columns are free draining and provide a path for pore water pressures generated in the surrounding soils during earthquake shaking to dissipate. When the stone columns/RAPs are installed below shallow foundations, their high stiffness relative to the surrounding weak soil attract most of the applied foundation loads, thereby reducing the loads imposed on the surrounding weak soil and reducing settlement.

With ground improvement, liquefaction triggering will be substantially mitigated but some ground deformation could still occur during an earthquake. Therefore, where ground improvement is utilized, it may be necessary to support buildings on heavily reinforced mat foundations to help distribute the building loads, improve building performance, and mitigate structural damage.

Our conceptual ground improvement below buildings (where deemed feasible) consists of 30-inch diameter (minimum) stone columns/RAPs spaced in a 6- to7-foot triangular grid pattern below a mat foundation. The stone columns/RAPs would extend at least 10 feet beyond the edges of the mat foundation and would extend to the top of the bedrock between 25 and 50 feet bgs. With this concept, we expect the mat foundation can be designed for an allowable bearing pressure on the order of 3 to 4 kips per square foot (ksf).

Aspect will be available to support the design team with a critical cost/benefit evaluation of this alternative compared with deep foundations.

4.2.3 Floor Slabs

Where building serviceability requirements will not allow for differential slab settlement and associated cracking (such as where heavy forklifts would operate), concrete floor slabs will need to be structurally designed as pile supported or as rafted structural mats over improved ground. In non-critical areas, conventional slab-on-grade construction would be feasible.

4.3 Temporary Shoring and Construction Dewatering

In the event that building concepts evolve to include permanent basements, this section provides general recommendations for temporary shoring and construction dewatering.

Excavations deeper than about 5 feet bgs will encounter groundwater and saturated soil conditions. Therefore, we recommend a relatively watertight shoring system consisting of interlocking steel sheet piling.

This system would utilize interlocking steel sheet piling augmented with internal bracing or external ground anchors (tieback anchors) for lateral support, if necessary. Construction dewatering would be completed using a well point or deep well system and excavation would be accomplished "in the dry." The elements of this system and likely construction sequence, are described below.

1. Heavy walled Z-section steel sheet piling would be installed using either vibratory or press-in methods to the required depth for stability and groundwater control. We expect the tips of the sheet piles would extend approximately 20 feet below the bottom of the excavation.
2. The dewatering system would be installed around the interior perimeter of the sheet piling, within the corrugated pockets (i.e., fluting) of the sheets.
3. Excavation would begin and the dewatering system would be put into operation as the excavation comes within a few feet above the groundwater level.
4. The excavation would continue down to the planned bottom. One or more levels of internal bracing or tieback anchors, if required, would be installed as the excavation is advanced.
5. Once the excavation has reached the target depth, a thick concrete slab (tremie slab) would be placed. The thickness of the slab needs to be sufficient to counteract upward buoyant forces on the floor slab.
6. Dewatering would continue until the permanent basement walls and floor are completed. Minor leakage would be managed using interior sumps and submersible pumps. Groundwater collected by the dewatering system would require treatment to meet water quality standards prior to discharge.

A shoring deformation monitoring program will need to be undertaken during construction to monitor shoring wall performance and deformation of adjacent sidewalks, streets, and the adjacent BNSF railroad.

4.4 Permanent Subsurface Drainage

For buildings constructed entirely above grade, we expect that conventional subsurface drainage consisting of perimeter footing drains will be feasible. For buildings with basements extending below groundwater, we recommend they be designed and constructed with a relatively watertight basement system as described above. Minor leakage into the basement would be managed using interior sumps and pumps.

4.5 Earthwork Considerations

4.5.1 General

In our opinion, the couple feet of remedial excavation that will be necessary to clean up the Site can be accomplished with conventional tracked excavators and dozers. The same is true for excavations that extend deeper, such as for a basement. However, due to the Site history, it should be expected that unknown or relic buried structures, foundations, and utilities will be encountered during construction.

Site earthwork must consider environmental factors and be accomplished in a manner that satisfies the environmental requirements for site development.

4.5.2 Reuse of On-Site Soil

The on-site soils have appreciable fines (soil particles passing the No. 200 sieve), which makes them susceptible to disturbance from construction traffic and difficult to compact, especially during wet weather. In our opinion, the on-site soils are not suitable for reuse as structural fill beneath and around foundations, slabs, pavements, or walls. Environmental factors are also expected to limit their suitability for reuse.

For planning purposes, all excavated soil should be exported from the Site and all structural fill that is required should be clean imported granular soil.

4.6 Recommendations for Further Study

The preliminary conclusions and recommendations presented in this report are based on limited data from existing environmental explorations completed at the Site, and our experience with similar redevelopment projects. Additional geotechnical explorations and laboratory testing will be necessary to verify and further characterize the subsurface conditions, inform foundation and/or ground improvement design, and to further evaluate groundwater conditions and construction dewatering (if required). Depending on the selected foundation systems and building characteristics (i.e., fundamental periods), a site-specific ground response analysis may be required to develop seismic design response spectra.

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Limitations

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

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TABLES

Table 1. Soil Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

				Current Explorations													Current Explorations				
			Location	LW-SB101	LW-SB101	LW-SB101	LW-SB102	LW-SB102	LW-SB102	LW-SB103	LW-SB103	LW-SB103	LW-SB104	LW-SB104	LW-SB104	LW-SB105	LW-SB105	LW-SB105	LW-SB106	LW-SB106	LW-SB106
			Depth	1 ft	10.5 ft	13.5 ft	1 ft	8 ft	11 ft	1 ft	7.3 ft	11 ft	1.5 ft	5 ft	10 ft	1.5 ft	7 ft	12 ft	2 ft	8 ft	11.5 ft
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Date	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020	08/03/2020
Analyte	Unit	Unsaturated Soil Cleanup Level	Saturated Soil Cleanup Level																		
Metals																					
Arsenic	mg/kg	20	20	10 U	12 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	11 U	13 U	15 U	11 U	13 U	13 U	14 U	13 U	12 U
Cadmium	mg/kg	1	1	0.52 U	0.62 U	0.60 U	0.54 U	0.61 U	0.64 U	0.53 U	0.60 U	0.60 U	0.56 U	0.63 U	0.75 U	0.54 U	0.65 U	0.65 U	0.68 U	0.63 U	0.60 U
Chromium	mg/kg	5200	260	**21**	**17**	**29**	**31**	**13**	**17**	**14**	**17**	**26**	**58**	**16**	**38**	**19**	**26**	**15**	**150**	**17**	**14**
Chromium (VI)	mg/kg	48	48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	mg/kg	36	36	**24**	**10**	**25**	**34**	**5.8**	**6.4**	**23**	**14**	**16**	**30**	**7**	**35**	**16**	**49**	**10**	**650**	**7.7**	**13**
Lead	mg/kg	250	81	**120**	6.2 U	6.0 U	**74**	6.1 U	6.4 U	5.3 U	6.0 U	6.0 U	**18**	6.3 U	**19**	5.4 U	**66**	6.5 U	**140**	6.3 U	6.0 U
Mercury	mg/kg	24	24	0.26 U	0.31 U	0.30 U	**1.2**	0.30 U	0.32 U	0.26 U	0.30 U	0.30 U	0.28 U	0.31 U	0.37 U	0.27 U	0.33 U	0.33 U	0.34 U	0.32 U	0.30 U
Nickel	mg/kg	48	48	**18**	**22**	**34**	**34**	**14**	**17**	**17**	**24**	**23**	**32**	**15**	**42**	**25**	**33**	**22**	**28**	**17**	**21**
Zinc	mg/kg	100	85	**130**	**36**	**44**	**65**	**16**	**21**	**51**	**63**	**34**	**55**	**18**	**75**	**26**	**110**	**22**	**230**	**22**	**28**
Total Petroleum Hydrocarbons (TPH)																					
Diesel Range Organics	mg/kg			26 U	31 U	30 U	**31 J**	31 U	32 U	26 U	30 U	30 U	**29**	31 U	37 U	27 U	33 U	33 U	34 U	32 U	30 U
Oil Range Organics	mg/kg			**120**	62 U	60 U	**770**	61 U	64 U	53 U	61 U	60 U	**170**	63 U	**76**	54 U	65 U	65 U	68 U	63 U	60 U
Diesel + Oil Range Organics	mg/kg	2000	2000	**133**	62 U	60 U	**801 J**	61 U	64 U	53 U	61 U	60 U	**199**	63 U	**95**	54 U	65 U	65 U	68 U	63 U	60 U
Polycyclic Aromatic Hydrocarbons (PAHs)																					
1-Methylnaphthalene	mg/kg	35	35	0.035 U	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.03**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	**0.079**	0.0084 U	0.0080 U
2-Methylnaphthalene	mg/kg	320	320	0.035 U	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.054**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	**0.089**	0.0084 U	0.0080 U
Acenaphthene	mg/kg	5.2	0.26	**0.05**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	**0.069**	**0.0087**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Acenaphthylene	mg/kg			**0.074**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	0.0075 U	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Anthracene	mg/kg	71	3.5	**0.14**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.013**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	**0.04**	0.0084 U	0.0080 U
Benzo(g,h,i)perylene	mg/kg			**0.24**	0.0083 U	0.0080 U	**0.04**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.011**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Fluoranthene	mg/kg	52	2.6	**0.57**	0.0083 U	0.0080 U	**0.14**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.043**	0.0083 U	0.010 U	0.0072 U	**0.019**	0.0087 U	**0.027**	0.0084 U	0.0080 U
Fluorene	mg/kg	7.4	0.37	**0.065**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	**0.014**	0.0075 U	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	**0.033**	0.0084 U	0.0080 U
Naphthalene	mg/kg	3.5	0.17	**0.06**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	**0.014**	**0.041**	0.0083 U	**0.013**	0.0072 U	**0.058**	0.0087 U	**0.24**	**0.015**	0.0080 U
Phenanthrene	mg/kg			**0.45**	0.0083 U	0.0080 U	**0.089**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.072**	0.0083 U	0.010 U	0.0072 U	**0.027**	0.0087 U	**0.13**	0.0084 U	0.0080 U
Pyrene	mg/kg	330	16	**0.59**	0.0083 U	0.0080 U	**0.17**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.042**	0.0083 U	0.010 U	0.0072 U	**0.02**	0.0087 U	**0.021**	0.0084 U	0.0080 U
Benz(a)anthracene	mg/kg			**0.32**	0.0083 U	0.0080 U	**0.044**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.016**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Benzo(a)pyrene	mg/kg			**0.33**	0.0083 U	0.0080 U	**0.051**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.012**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Benzo(b)fluoranthene	mg/kg			**0.64**	0.0083 U	0.0080 U	**0.07**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.02**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Benzo(j,k)fluoranthene	mg/kg			**0.16**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	0.0075 U	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Benzo(k)fluoranthene	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	mg/kg			**0.48**	0.0083 U	0.0080 U	**0.058**	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.024**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	**0.014**	0.0084 U	0.0080 U
Dibenzo(a,h)anthracene	mg/kg			**0.046**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	0.0075 U	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Indeno(1,2,3-cd)pyrene	mg/kg			**0.23**	0.0083 U	0.0080 U	0.036 U	0.0081 U	0.0085 U	0.0070 U	0.0081 U	0.0080 U	**0.01**	0.0083 U	0.010 U	0.0072 U	0.0087 U	0.0087 U	0.0091 U	0.0084 U	0.0080 U
Total cPAHs TEQ	mg/kg	0.19	0.19	**0.47**	0.0063 U	0.0060 U	**0.068**	0.0061 U	0.0064 U	0.0053 U	0.0061 U	0.0060 U	**0.018**	0.0063 U	0.0076 U	0.0054 U	0.0066 U	0.0066 U	**0.0070**	0.0063 U	0.0060 U
Other Semivolatile Organic Compounds (SVOCs)																					
1,2,4-Trichlorobenzene	mg/kg	0.26	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	0.77	0.039	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	1	0.051	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/kg	1900	93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/kg	0.3	0.015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/kg	3.8	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/kg	14	0.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/kg	5.6	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/kg	0.12	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/kg	80	3500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/kg	6400	6400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Chlorophenol	mg/kg	4.8	0.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylphenol	mg/kg	4000	4000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Nitroaniline	mg/kg	800	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Nitrophenol	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	mg/kg	0.47	0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Nitroaniline	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloroaniline	mg/kg	5	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1. Soil Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

				Current Explorations													Current Explorations				
			Location	**LW-SB101**	**LW-SB101**	**LW-SB101**	**LW-SB102**	**LW-SB102**	**LW-SB102**	**LW-SB103**	**LW-SB103**	**LW-SB103**	**LW-SB104**	**LW-SB104**	**LW-SB104**	**LW-SB105**	**LW-SB105**	**LW-SB105**	**LW-SB106**	**LW-SB106**	**LW-SB106**
			Depth	**1 ft**	**10.5 ft**	**13.5 ft**	**1 ft**	**8 ft**	**11 ft**	**1 ft**	**7.3 ft**	**11 ft**	**1.5 ft**	**5 ft**	**10 ft**	**1.5 ft**	**7 ft**	**12 ft**	**2 ft**	**8 ft**	**11.5 ft**
			Sample Type	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
			Date	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**	**08/03/2020**
Analyte	Unit	Unsaturated Soil Cleanup Level	Saturated Soil Cleanup Level																		
4-Chlorophenyl phenyl ether	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Methylphenol	mg/kg	400	400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitroaniline	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzoic acid	mg/kg	320000	320000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzyl alcohol	mg/kg	8000	8000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzyl butyl phthalate	mg/kg	1.6	0.079	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-chloro-1-methylethyl) ether	mg/kg	14	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-chloroethoxy)methane	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-chloroethyl) ether	mg/kg	0.015	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	mg/kg	35	1.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbazole	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	mg/kg	80	80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/kg	22	1.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate	mg/kg	72	3.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate	mg/kg	5300	270	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/kg	0.63	0.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/kg	3.5	0.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/kg	480	480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachloroethane	mg/kg	1.9	0.096	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isophorone	mg/kg	11	0.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrobenzene	mg/kg	29	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-Nitroso-di-n-propylamine	mg/kg	0.01	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/kg	1.6	0.079	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	mg/kg	0.58	0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	mg/kg	2900	160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Conventionals (including other metals)																					
Formaldehyde	mg/kg	16000	16000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Iron	mg/kg	56000	56000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	mg/kg	11000	11000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	pH units	2.5 - 11	2.5 - 11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

Bold - detected. Blue Shaded - Detected result exceeded cleanup level

U - Analyte not detected at or above Reporting Limit (RL) shown. J - Estimated value

Sample Type: N - Normal sample. FD - Field duplicate sample.

Table 1. Soil Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

				Prior Explorations								Prior Explorations						
			Location	**LW-MW01**	**LW-MW01**	**LW-SB01**	**LW-SB01**	**LW-SB02**	**LW-SB02**	**LW-SB03**	**LW-SB03**	**LW-SB04**	**LW-SB04**	**LW-SS01**	**LW-SS01**	**LW-SS02**	**LW-SS03**	**LW-SS04**
			Depth	**2.5 - 4 ft**	**5 - 6.5 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**
			Sample Type	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**FD**	**N**	**N**	**N**
			Date	**07/16/2004**	**07/16/2004**	**07/21/2004**	**07/21/2004**	**07/21/2004**	**07/21/2004**	**07/23/2004**	**07/23/2004**	**07/22/2004**	**07/22/2004**	**07/20/2004**	**07/20/2004**	**07/20/2004**	**07/20/2004**	**07/20/2004**
Analyte	Unit	Unsaturated Soil Cleanup Level	Saturated Soil Cleanup Level															
Metals																		
Arsenic	mg/kg	20	20	30 U	6 U	10 U	6 U	20 U	6 U	6 U	5 U	5 U	6 U	10 U	10 U	**10**	10 U	10 U
Cadmium	mg/kg	1	1	**11 J**	**0.7 J**	0.6 U	0.2 U	0.6 U	0.3 U	**0.7**	0.2 U	0.2 U	**0.3**	0.5 U	0.5 U	**1**	**0.6**	**1.4**
Chromium	mg/kg	5200	260	**35**	**25**	**43**	**39**	**48.9**	**35.3**	**844**	**390 J**	**140 J**	**60.4 J**	**24.9**	**25.9**	**173**	**1560**	**722**
Chromium (VI)	mg/kg	48	48	0.12 U	0.132 U	**0.6**	**0.521**	0.127 U	0.138 U	0.121 U	0.116 U	0.123 U	0.146 U	0.112 U	0.108 U	0.105 U	0.124 U	**0.123**
Copper	mg/kg	36	36	**31 J**	**13.7 J**	**72.7**	**29.1**	**49.1**	**20.8**	**58**	**31.3 J**	**23.4 J**	**39 J**	**36.6**	**35.1**	**88.4**	**66.5**	**53.3**
Lead	mg/kg	250	81	**40**	**9**	**171**	**16**	**15**	**7**	**97**	**19 J**	**5 J**	**13 J**	**6**	**6**	**54**	**53**	**80**
Mercury	mg/kg	24	24	**0.08**	0.06 U	**0.25 J**	**0.08 J**	**0.23 J**	**0.08 J**	**0.27**	**0.08**	**0.04**	**0.06**	**0.19 J**	**0.18 J**	**0.57 J**	**0.34 J**	**0.29 J**
Nickel	mg/kg	48	48	**27**	**25**	**46**	**35**	**46**	**25**	**48**	**32**	**28**	**41**	**30**	**34**	**52**	**24**	**36**
Zinc	mg/kg	100	85	**66**	**33.5**	**61 J**	**61.7 J**	**74 J**	**37.6 J**	**251**	**81.9 J**	**91.8 J**	**58.9 J**	**71 J**	**75 J**	**377 J**	**489 J**	**1450 J**
Total Petroleum Hydrocarbons (TPH)																		
Diesel Range Organics	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oil Range Organics	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diesel + Oil Range Organics	mg/kg	2000	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAHs)																		
1-Methylnaphthalene	mg/kg	35	35	**0.029**	0.0082 U	**0.026**	0.0084 U	**0.046**	**0.026**	0.022 U	**0.04**	**0.009**	**0.012**	0.0068 U	0.0068 U	**0.022**	**0.063**	0.0076 U
2-Methylnaphthalene	mg/kg	320	320	**0.046**	0.0082 U	**0.03**	0.0084 U	**0.08**	**0.041**	0.022 U	**0.088**	**0.019**	**0.022**	0.0068 U	0.0068 U	**0.042**	**0.14**	**0.015**
Acenaphthene	mg/kg	5.2	0.26	0.0092 U	0.0082 U	0.0082 U	0.0084 U	0.0089 U	0.0084 U	**0.066**	**0.1**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.24**	**2.4**	**0.0091**
Acenaphthylene	mg/kg			0.0092 U	0.0082 U	0.0082 U	0.0084 U	0.0089 U	0.0084 U	0.022 U	0.0076 U	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.039**	**0.049**	**0.015**
Anthracene	mg/kg	71	3.5	0.0092 U	0.0082 U	**0.016**	0.0084 U	0.0089 U	0.0084 U	**0.067**	**0.18**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.3**	**2.4**	**0.046**
Benzo(g,h,i)perylene	mg/kg			**0.012**	0.0082 U	0.0082 U	0.0084 U	0.0089 U	0.0084 U	**0.2**	**0.23**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.57**	**15**	**0.022**
Fluoranthene	mg/kg	52	2.6	**0.048**	**0.015**	**0.037**	**0.03**	**0.037**	**0.012**	**0.68**	**0.9**	0.0073 U	0.0092 U	**0.016**	**0.011**	**2.7**	**22**	**0.11**
Fluorene	mg/kg	7.4	0.37	0.0092 U	0.0082 U	0.0082 U	0.0084 U	0.0089 U	0.0084 U	**0.024**	**0.069**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.082**	**0.57**	**0.011**
Naphthalene	mg/kg	3.5	0.17	**0.02**	**0.0091**	**0.012**	**0.0093**	**0.025**	**0.011**	0.022 U	**0.3**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.048**	**0.17**	**0.014**
Phenanthrene	mg/kg			**0.066**	**0.014**	**0.09**	**0.048**	**0.053**	**0.024**	**0.24**	**0.63**	0.0073 U	0.0092 U	**0.018**	**0.012**	**1.1**	**8.8**	**0.084**
Pyrene	mg/kg	330	16	**0.071**	**0.018**	**0.08**	**0.054**	**0.05**	**0.016**	**0.52**	**0.81**	**0.025**	0.0092 U	**0.012**	**0.0081**	**2.3**	**20**	**0.085**
Benz(a)anthracene	mg/kg			**0.024**	0.0082 U	**0.027**	**0.012**	**0.016**	0.0084 U	**0.41**	**0.71**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**1.8**	**17**	**0.038**
Benzo(a)pyrene	mg/kg			**0.026**	0.0082 U	**0.025**	**0.012**	**0.022**	**0.011**	**0.63**	**0.76**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**2.4**	**22**	**0.049**
Benzo(b)fluoranthene	mg/kg			**0.03**	0.0082 U	**0.026**	**0.012**	**0.036**	**0.016**	**0.62**	**0.59**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**2.2**	**20**	**0.073**
Benzo(j,k)fluoranthene	mg/kg			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/kg			**0.03**	0.0082 U	**0.02**	**0.0093**	**0.036**	**0.016**	**0.53**	**0.72**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**2.1**	**16**	**0.073**
Chrysene	mg/kg			**0.059**	0.0082 U	**0.048**	**0.018**	**0.046**	**0.023**	**0.42**	**0.69**	**0.027**	0.0092 U	**0.01**	0.0068 U	**1.9**	**17**	**0.053**
Dibenzo(a,h)anthracene	mg/kg			0.0092 U	0.0082 U	0.0082 U	0.0084 U	0.0089 U	0.0084 U	**0.058**	**0.081**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.25**	**1.5**	0.0076 U
Indeno(1,2,3-cd)pyrene	mg/kg			0.0092 U	0.0082 U	0.0082 U	0.0084 U	0.0089 U	0.0084 U	**0.18**	**0.24**	0.0073 U	0.0092 U	0.0068 U	0.0068 U	**0.56**	**13**	**0.02**
Total cPAHs TEQ	mg/kg	0.19	0.19	**0.0373**	0.00742 U	**0.0336**	**0.0164**	**0.0322**	**0.0157**	**0.81**	**1.00**	**0.00575**	0.0083 U	**0.0052**	0.0061 U	**3.11**	**28.95**	**0.0703**
Other Semivolatile Organic Compounds (SVOCs)																		
1,2,4-Trichlorobenzene	mg/kg	0.26	0.013	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
1,2-Dichlorobenzene	mg/kg	0.77	0.039	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
1,3-Dichlorobenzene	mg/kg			0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
1,4-Dichlorobenzene	mg/kg	1	0.051	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
2,4,5-Trichlorophenol	mg/kg	1900	93	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
2,4,6-Trichlorophenol	mg/kg	0.3	0.015	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
2,4-Dichlorophenol	mg/kg	3.8	0.2	0.28 U	1.5 U	0.24 U	0.25 U	0.27 U	0.25 U	0.22 U	0.23 U	0.22 U	0.28 U	0.2 U	0.2 U	0.2 U	0.22 U	0.23 U
2,4-Dimethylphenol	mg/kg	14	0.73	0.28 U	1.5 U	0.24 U	0.25 U	0.27 U	0.25 U	0.22 U	0.23 U	0.22 U	0.28 U	0.2 U	0.2 U	0.2 U	0.22 U	0.23 U
2,4-Dinitrophenol	mg/kg	5.6	0.4	0.92 U	4.9 U	0.82 U	0.85 U	0.89 U	0.84 U	0.73 U	0.75 U	0.73 U	0.92 U	0.68 U	0.68 U	0.68 U	0.73 U	0.75 U
2,4-Dinitrotoluene	mg/kg	0.12	0.01	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
2,6-Dinitrotoluene	mg/kg	80	3500	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
2-Chloronaphthalene	mg/kg	6400	6400	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
2-Chlorophenol	mg/kg	4.8	0.24	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
2-Methylphenol	mg/kg	4000	4000	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
2-Nitroaniline	mg/kg	800	800	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
2-Nitrophenol	mg/kg			0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
3,3'-Dichlorobenzidine	mg/kg	0.47	0.1	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
3-Nitroaniline	mg/kg			0.55 U	3 U	0.49 U	0.51 U	0.53 U	0.51 U	0.44 U	0.45 U	0.44 U	0.55 U	0.41 U	0.41 U	0.41 U	0.44 U	0.45 U
4,6-Dinitro-2-methylphenol	mg/kg			0.92 U	4.9 U	0.82 U	0.85 U	0.89 U	0.84 U	0.73 U	0.75 U	0.73 U	0.92 U	0.68 U	0.68 U	0.68 U	0.73 U	0.75 U
4-Bromophenyl phenyl ether	mg/kg			0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
4-Chloro-3-methylphenol	mg/kg			0.18 U	0.98 U	0.16 U	0.17 U	0.18 U	0.17 U	0.15 U	0.15 U	0.15 U	0.18 U	0.14 U	0.14 U	0.14 U	0.15 U	0.15 U
4-Chloroaniline	mg/kg	5	5	0.28 U	1.5 U	0.24 U	0.25 U	0.27 U	0.25 U	0.22 U	0.23 U	0.22 U	0.28 U	0.2 U	0.2 U	0.2 U	0.22 U	0.23 U

Table 1. Soil Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

				Prior Explorations								Prior Explorations						
			Location	**LW-MW01**	**LW-MW01**	**LW-SB01**	**LW-SB01**	**LW-SB02**	**LW-SB02**	**LW-SB03**	**LW-SB03**	**LW-SB04**	**LW-SB04**	**LW-SS01**	**LW-SS01**	**LW-SS02**	**LW-SS03**	**LW-SS04**
			Depth	**2.5 - 4 ft**	**5 - 6.5 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 4 ft**	**4 - 8 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**
			Sample Type	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**FD**	**N**	**N**	**N**
			Date	**07/16/2004**	**07/16/2004**	**07/21/2004**	**07/21/2004**	**07/21/2004**	**07/21/2004**	**07/23/2004**	**07/23/2004**	**07/22/2004**	**07/22/2004**	**07/20/2004**	**07/20/2004**	**07/20/2004**	**07/20/2004**	**07/20/2004**
Analyte	Unit	Unsaturated Soil Cleanup Level	Saturated Soil Cleanup Level															
4-Chlorophenyl phenyl ether	mg/kg			0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
4-Methylphenol	mg/kg	400	400	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
4-Nitroaniline	mg/kg			0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
4-Nitrophenol	mg/kg			0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
Benzoic acid	mg/kg	320000	320000	0.92 U	4.9 U	0.82 U	0.85 U	0.89 U	0.84 U	0.73 U	0.75 U	0.73 U	0.92 U	0.68 U	0.68 U	0.68 U	0.73 U	0.75 U
Benzyl alcohol	mg/kg	8000	8000	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
Benzyl butyl phthalate	mg/kg	1.6	0.079	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Bis(2-chloro-1-methylethyl) ether	mg/kg	14	14	--	--	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Bis(2-chloroethoxy)methane	mg/kg			0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Bis(2-chloroethyl) ether	mg/kg	0.015	0.01	0.18 U	0.98 U	0.16 U	0.17 U	0.18 U	0.17 U	0.15 U	0.15 U	0.15 U	0.18 U	0.14 U	0.14 U	0.14 U	0.15 U	0.15 U
Bis(2-ethylhexyl) phthalate	mg/kg	35	1.8	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	**1.0**	**0.98**	0.073 U	0.092 U	0.068 U	0.068 U	**0.36**	**1.4**	**0.14**
Carbazole	mg/kg			0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	**0.14**	**1.1**	0.075 U
Dibenzofuran	mg/kg	80	80	0.0092 U	0.0082 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	**0.22**	0.075 U
Diethyl phthalate	mg/kg	22	1.2	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Dimethyl phthalate	mg/kg			0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	**0.37**	0.073 U	0.075 U
Di-n-butyl phthalate	mg/kg	72	3.6	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Di-n-octyl phthalate	mg/kg	5300	270	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Hexachlorobenzene	mg/kg	0.63	0.26	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Hexachlorobutadiene	mg/kg	3.5	0.17	0.18 U	0.98 U	0.16 U	0.17 U	0.18 U	0.17 U	0.15 U	0.15 U	0.15 U	0.18 U	0.14 U	0.14 U	0.14 U	0.15 U	0.15 U
Hexachlorocyclopentadiene	mg/kg	480	480	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
Hexachloroethane	mg/kg	1.9	0.096	0.18 U	0.98 U	0.16 U	0.17 U	0.18 U	0.17 U	0.15 U	0.15 U	0.15 U	0.18 U	0.14 U	0.14 U	0.14 U	0.15 U	0.15 U
Isophorone	mg/kg	11	0.62	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Nitrobenzene	mg/kg	29	1.5	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
N-Nitroso-di-n-propylamine	mg/kg	0.01	0.01	0.18 U	0.98 U	0.16 U	0.17 U	0.18 U	0.17 U	0.15 U	0.15 U	0.15 U	0.18 U	0.14 U	0.14 U	0.14 U	0.15 U	0.15 U
N-Nitrosodiphenylamine	mg/kg	1.6	0.079	0.092 U	0.49 U	0.082 U	0.085 U	0.089 U	0.084 U	0.073 U	0.075 U	0.073 U	0.092 U	0.068 U	0.068 U	0.068 U	0.073 U	0.075 U
Pentachlorophenol	mg/kg	0.58	0.1	0.46 U	2.5 U	0.41 U	0.42 U	0.44 U	0.42 U	0.37 U	0.38 U	0.37 U	0.46 U	0.34 U	0.34 U	0.34 U	0.37 U	0.38 U
Phenol	mg/kg	2900	160	0.18 U	0.98 U	0.16 U	0.17 U	0.18 U	0.17 U	0.15 U	0.15 U	0.15 U	0.18 U	0.14 U	0.14 U	0.14 U	0.15 U	0.15 U
Conventionals (including other metals)																		
Formaldehyde	mg/kg	16000	16000	--	**261**	**6.51**	--	--	**36.4**	**19.7**	--	--	**150 J**	**9.26**	**11.1**	**18.1**	**15.8**	**11.7**
Iron	mg/kg	56000	56000	**11500**	**13900**	**18400**	**20300**	**32800**	**16100**	**26000**	**20300**	**18600**	**26600**	**25600**	**28500**	**39500**	**42400**	**29500**
Manganese	mg/kg	11000	11000	**265**	**174**	**2780**	**611**	**481**	**286**	**585**	**450**	**318**	**518**	**452**	**500**	**544**	**461**	**468**
pH	pH units	2.5 - 11	2.5 - 11	**8.51**	**7.67**	**11.85**	**10.38**	**8.06**	**8.05**	**7.45**	**10.36**	**7.58**	**8.44**	**7**	**6.85**	**7.49**	**5.21**	**7.76**

Notes:

Bold - detected. Blue Shaded - Detected result exceeded cleanup level

U - Analyte not detected at or above Reporting Limit (RL) shown. J - Estimated value

Sample Type: N - Normal sample. FD - Field duplicate sample.

Table 2. Groundwater Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

		Location	LW-MW01	LW-MW01	LW-MW01	LW-MW01
		Sample Type	N	FD	N	N
		Date	7/27/2004	7/27/2004	10/1/2009	3/30/2010
Analyte	Unit	Groundwater Cleanup Level				
Dissolved Metals						
Arsenic	ug/L	8	17	17.0	3.95	2.3
Cadmium	ug/L	7.9	12	11.1	0.074	0.047
Chromium	ug/L	260	1,170	1,110	633	792
Chromium (VI)	ug/L	50	224 U	224 U	50 U	50 U
Copper	ug/L	3.1	75	78	3.08	2.99
Lead	ug/L	8.1	34	32	0.132	0.133
Mercury	ug/L	0.059	0.3	0.2	0.00197	0.00225
Nickel	ug/L	8.2	64	63	5.53	5.11
Zinc	ug/L	81	110	100	4.4	3.3
Total Petroleum Hydrocarbons (TPH)						
Gasoline Range Organics	ug/L	1000	250 UJ	250 UJ		
Diesel Range Organics	ug/L		250 U	250 U		
Oil Range Organics	ug/L		500 U	500 U		
Diesel + Oil Range Organics	ug/L	500	500 U	500 U		
Polycyclic Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ug/L	3.3	0.10 U	0.10 U		
Acenaphthylene	ug/L		0.10 U	0.10 U		
Anthracene	ug/L	9.6	0.10	0.10 U		
Benzo(g,h,i)perylene	ug/L		0.10 U	0.10 U		
Fluoranthene	ug/L	3.3	0.10 U	0.10 U		
Fluorene	ug/L	3	0.15	0.10 U		
Phenanthrene	ug/L		0.10 U	0.10 U		
Pyrene	ug/L	15	0.10 U	0.10 U		
1-Methylnaphthalene	ug/L		0.10 U	0.10 U		
2-Methylnaphthalene	ug/L		0.11	0.10 U		
Naphthalene	ug/L	1.4	0.10 U	0.10 U		
Benz(a)anthracene	ug/L		0.10 U	0.10 U		
Benzo(a)pyrene	ug/L		0.10 U	0.10 U		
Benzo(b)fluoranthene	ug/L		0.10 U	0.10 U		
Benzo(k)fluoranthene	ug/L		0.10 U	0.10 U		
Chrysene	ug/L		0.10 U	0.10 U		
Dibenzo(a,h)anthracene	ug/L		0.10 U	0.10 U		
Indeno(1,2,3-cd)pyrene	ug/L		0.10 U	0.10 U		
Total cPAHs TEQ	ug/L	0.02	0.15 U	0.15 U		
Other Semivolatile Organic Compounds (SVOCs)						
1,2,4-Trichlorobenzene	ug/L		1.0 U	1.0 U		
1,2-Dichlorobenzene	ug/L		1.0 U	1.0 U		
1,3-Dichlorobenzene	ug/L		1.0 U	1.0 U		
1,4-Dichlorobenzene	ug/L		1.0 U	1.0 U		
2,4,5-Trichlorophenol	ug/L		5.0 U	5.0 U		
2,4,6-Trichlorophenol	ug/L		5.0 U	5.0 U		
2,4-Dichlorophenol	ug/L		3.0 U	3.0 U		
2,4-Dimethylphenol	ug/L		3.0 U	3.0 U		
2,4-Dinitrophenol	ug/L		25 U	25 U		
2-Chloronaphthalene	ug/L		1.0 U	1.0 U		
2-Chlorophenol	ug/L		1.0 U	1.0 U		
2-Methylphenol	ug/L		1.0 U	1.0 U		
2-Nitroaniline	ug/L		5.0 U	5.0 U		
2-Nitrophenol	ug/L		5.0 U	5.0 U		

Table 2. Groundwater Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

		Location	LW-MW01	LW-MW01	LW-MW01	LW-MW01
		Sample Type	N	FD	N	N
		Date	7/27/2004	7/27/2004	10/1/2009	3/30/2010
Analyte	Unit	Groundwater Cleanup Level				
2,4-Dinitrotoluene	ug/L		5.0 U	5.0 U		
2,6-Dinitrotoluene	ug/L		5.0 U	5.0 U		
3,3'-Dichlorobenzidine	ug/L		5.0 U	5.0 U		
3-Nitroaniline	ug/L		6.0 U	6.0 U		
4,6-Dinitro-2-methylphenol	ug/L		15 U	15 U		
4-Bromophenyl phenyl ether	ug/L		1.0 U	1.0 U		
4-Chloro-3-methylphenol	ug/L		2.0 U	2.0 U		
4-Chloroaniline	ug/L		3.0 U	3.0 U		
4-Chlorophenyl phenyl ether	ug/L		1.0 U	1.0 U		
4-Methylphenol	ug/L		8.1	7.2		
4-Nitroaniline	ug/L		5.0 U	5.0 U		
4-Nitrophenol	ug/L		5.0 U	5.0 U		
Benzoic acid	ug/L		11	10 U		
Benzyl alcohol	ug/L		5.0 U	5.0 U		
Benzyl butyl phthalate	ug/L		1.0 U	1.0 U		
Bis(2-chloro-1-methylethyl) ether	ug/L		1.0 U	1.0 U		
Bis(2-chloroethoxy)methane	ug/L		1.0 U	1.0 U		
Bis(2-chloroethyl) ether	ug/L		2.0 U	2.0 U		
Bis(2-ethylhexyl) phthalate	ug/L		1.0 U	1.1 U		
Carbazole	ug/L		1.0 U	1.0 U		
Dibenzofuran	ug/L		1.0 U	1.0 U		
Diethyl phthalate	ug/L		1.0 U	1.0 U		
Dimethyl phthalate	ug/L		1.0 U	1.0 U		
Di-n-butyl phthalate	ug/L		1.0 U	1.0 U		
Di-n-octyl phthalate	ug/L		1.0 U	1.0 U		
Hexachlorobenzene	ug/L		1.0 U	1.0 U		
Hexachlorobutadiene	ug/L		2.0 U	2.0 U		
Hexachlorocyclopentadiene	ug/L		5.0 U	5.0 U		
Hexachloroethane	ug/L		2.0 U	2.0 U		
Isophorone	ug/L		1.0 U	1.0 U		
Nitrobenzene	ug/L		1.0 U	1.0 U		
N-Nitroso-di-n-propylamine	ug/L		2.0 U	2.0 U		
N-Nitrosodiphenylamine	ug/L		1.0 U	1.0 U		
Pentachlorophenol	ug/L		2.6 J	2.6 J		
Phenol	ug/L		28	26		
Volatile Organic Compounds (VOCs)						
1,1,1,2-Tetrachloroethane	ug/L		5.0 UJ	5.0 UJ		
1,1,1-Trichloroethane	ug/L		5.0 UJ	5.0 UJ		
1,1,2 - Trichlorotrifluoroethane	ug/L		10 UJ	10 UJ		
1,1,2,2-Tetrachloroethane	ug/L		5.0 UJ	5.0 UJ		
1,1,2-Trichloroethane	ug/L		5.0 UJ	5.0 UJ		
1,1-Dichloroethane	ug/L		5.0 UJ	5.0 UJ		
1,1-Dichloroethene	ug/L		5.0 UJ	5.0 UJ		
1,1-Dichloropropene	ug/L		5.0 UJ	5.0 UJ		
1,2,3-Trichlorobenzene	ug/L		25 UJ	25 UJ		
1,2,3-Trichloropropane	ug/L		15 UJ	15 UJ		
1,2,4-Trichlorobenzene	ug/L		25 UJ	25 UJ		
1,2,4-Trimethylbenzene	ug/L		5.0 UJ	5.0 UJ		
1,2-Dibromo-3-chloropropane	ug/L		25 UJ	25 UJ		
1,2-Dibromoethane (EDB)	ug/L		5.0 UJ	5.0 UJ		
1,2-Dichlorobenzene	ug/L		5.0 UJ	5.0 UJ		

Table 2. Groundwater Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

		Location	LW-MW01	LW-MW01	LW-MW01	LW-MW01
		Sample Type	N	FD	N	N
		Date	7/27/2004	7/27/2004	10/1/2009	3/30/2010
Analyte	Unit	Groundwater Cleanup Level				
1,2-Dichloroethane (EDC)	ug/L		5.0 UJ	5.0 UJ		
1,2-Dichloropropane	ug/L		5.0 UJ	5.0 UJ		
1,3,5-Trimethylbenzene	ug/L		5.0 UJ	5.0 UJ		
1,3-Dichlorobenzene	ug/L		5.0 UJ	5.0 UJ		
1,3-Dichloropropane	ug/L		5.0 UJ	5.0 UJ		
1,4-Dichloro-2-Butene	ug/L		25 UJ	25 UJ		
1,4-Dichlorobenzene	ug/L		5.0 UJ	5.0 UJ		
2,2-Dichloropropane	ug/L		5.0 UJ	5.0 UJ		
2-Butanone	ug/L		25 UJ	25 UJ		
2-Chloroethyl Vinyl Ether	ug/L		25 UJ	25 UJ		
2-Chlorotoluene	ug/L		5.0 UJ	5.0 UJ		
2-Hexanone	ug/L		25 UJ	25 UJ		
4-Chlorotoluene	ug/L		5.0 UJ	5.0 UJ		
4-Methyl-2-pentanone	ug/L		25 UJ	25 UJ		
Acetone	ug/L		55 J	51 J		
Acrolein	ug/L		250 UJ	250 UJ		
Acrylonitrile	ug/L		5.0 UJ	5.0 UJ		
Benzene	ug/L		5.0 UJ	5.0 UJ		
Bromobenzene	ug/L		5.0 UJ	5.0 UJ		
Bromochloromethane	ug/L		5.0 UJ	5.0 UJ		
Bromodichloromethane	ug/L		5.0 UJ	5.0 UJ		
Bromoethane	ug/L		10 UJ	10 UJ		
Bromoform	ug/L		5.0 UJ	5.0 UJ		
Bromomethane	ug/L		5.0 UJ	5.0 UJ		
Carbon disulfide	ug/L		5.0 UJ	5.0 UJ		
Carbon tetrachloride	ug/L		5.0 UJ	5.0 UJ		
Chlorobenzene	ug/L		5.0 UJ	5.0 UJ		
Chloroethane	ug/L		5.0 UJ	5.0 UJ		
Chloroform	ug/L		5.0 UJ	5.0 UJ		
Chloromethane	ug/L		5.0 UJ	5.0 UJ		
cis-1,2-Dichloroethene (DCE)	ug/L		5.0 UJ	5.0 UJ		
cis-1,3-Dichloropropene	ug/L		5.0 UJ	5.0 UJ		
Dibromochloromethane	ug/L		5.0 UJ	5.0 UJ		
Dibromomethane	ug/L		5.0 UJ	5.0 UJ		
Ethylbenzene	ug/L		5.0 UJ	5.0 UJ		
Hexachlorobutadiene	ug/L		25 UJ	25 UJ		
Isopropylbenzene	ug/L		5.0 UJ	5.0 UJ		
Methylene chloride	ug/L		10 UJ	10 UJ		
Methyliodide	ug/L		5.0 UJ	5.0 UJ		
n-Butylbenzene	ug/L		5.0 UJ	5.0 UJ		
n-Propylbenzene	ug/L		5.0 UJ	5.0 UJ		
p-Isopropyltoluene	ug/L		5.0 UJ	5.0 UJ		
sec-Butylbenzene	ug/L		5.0 UJ	5.0 UJ		
Styrene	ug/L		5.0 UJ	5.0 UJ		
tert-Butylbenzene	ug/L		5.0 UJ	5.0 UJ		
Tetrachloroethene (PCE)	ug/L		5.0 UJ	5.0 UJ		
Toluene	ug/L		5.0 UJ	5.0 UJ		
trans-1,2-Dichloroethene	ug/L		5.0 UJ	5.0 UJ		
trans-1,3-Dichloropropene	ug/L		5.0 UJ	5.0 UJ		
Trichloroethene (TCE)	ug/L		5.0 UJ	5.0 UJ		
Trichlorofluoromethane	ug/L		5.0 UJ	5.0 UJ		

Table 2. Groundwater Quality Data for Lignin Parcel

Project 190239, Lignin Parcel, GP West Site, Bellingham, Washington

		Location	LW-MW01	LW-MW01	LW-MW01	LW-MW01
		Sample Type	N	FD	N	N
		Date	7/27/2004	7/27/2004	10/1/2009	3/30/2010
Analyte	Unit	Groundwater Cleanup Level				
Vinyl acetate	ug/L		25 UJ	25 UJ		
Vinyl chloride	ug/L		5.0 UJ	5.0 UJ		
Xylenes (total)	ug/L		5.0 UJ	5.0 UJ		
Naphthalene	ug/L	1.4	25 UJ	25 UJ		
Polychlorinated Biphenyls (PCBs)						
Aroclor 1016	ug/L		0.10 UJ	0.10 UJ		
Aroclor 1221	ug/L		0.10 UJ	0.10 UJ		
Aroclor 1232	ug/L		0.10 UJ	0.10 UJ		
Aroclor 1242	ug/L		0.10 UJ	0.10 UJ		
Aroclor 1248	ug/L		0.10 UJ	0.10 UJ		
Aroclor 1254	ug/L		0.10 UJ	0.10 UJ		
Aroclor 1260	ug/L		0.10 UJ	0.10 UJ		
Total PCBs	ug/L		0.10 UJ	0.10 UJ		
Conventional Chemistry Parameters (including other dissolved metals)						
Calcium	mg/L				55.9	
Iron	mg/L		19.8	20.4	0.311	
Magnesium	mg/L				5.49	
Manganese	mg/L		0.381	0.404	0.141	
Potassium	mg/L				7.25	
Sodium	mg/L				308	
Formaldehyde	ug/L		6 U	7 U		
Nitrate + Nitrite	mg/L		0.500 U	0.500 U		
Nitrate as Nitrogen	mg/L		0.500 U	0.500 U		
Nitrite as Nitrogen	mg/L		0.500 U	0.500 U		
Sulfate	mg/L		233	216		
Total Suspended Solids	mg/L		56.2	42.7		
Field Parameters						
Conductivity	us/cm		2,850		1,476	1,175
Dissolved Oxygen	mg/L		1.62		0.43	0.6
ORP	mVolts		-418.3		-365.5	-306.3
pH	pH units	6.2 - 8.5	10.8		8.4	8.9
Practical Salinity (Calculated)	PSU		1.5		0.7	0.6
Temperature	deg C		17.52		18	11.54
Turbidity	NTU		252		10	20

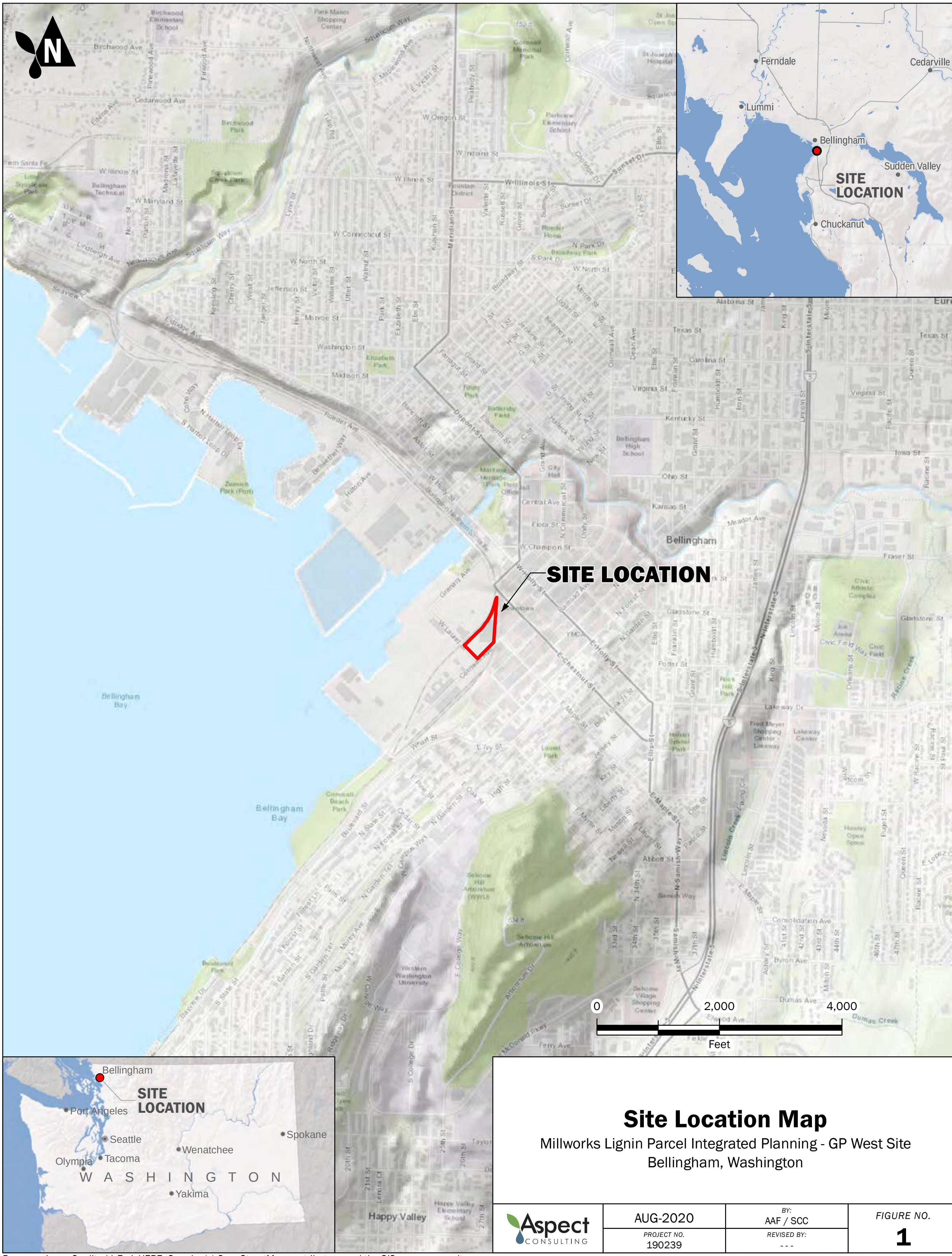
Notes:

Bold - detected. Blue Shaded - Detected result exceeded cleanup level

U - Analyte not detected at or above Reporting Limit (RL) shown. J - Estimated value

Sample Type: N - Normal sample. FD - Field duplicate sample.

FIGURES



Site Location Map

Millworks Lignin Parcel Integrated Planning - GP West Site
Bellingham, Washington

Aspect CONSULTING	AUG-2020	BY: AAF / SCC	FIGURE NO.
	PROJECT NO. 190239	REVISED BY: - - -	1

GIS Path: T:\projects_8\Port_of_Bellingham\Delivered\Lignin Parcel Integrated Planning\SiteLocationMap.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/20/2020 || User: scudd || Print Date: 8/20/2020

Basemap Layer Credits || Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Current Exploration Phase

- Soil Boring

Prior Explorations

- Geotechnical Soil Boring
- Monitoring Well
- Soil Boring
- Surface Soil Sample

0 30 60 120
Feet

MILL NORTH
TRUE NORTH
45°

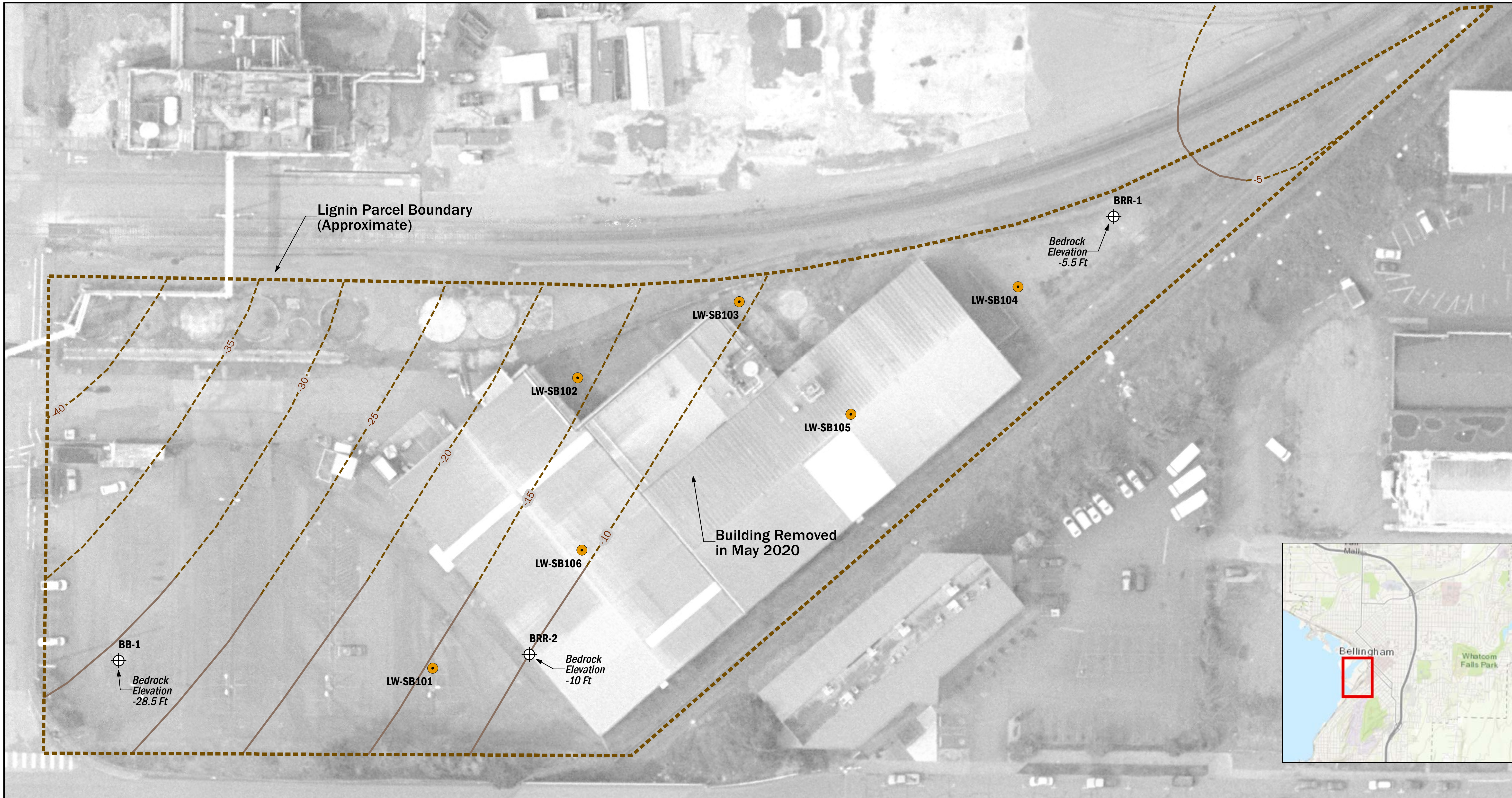
Aspect CONSULTING

Site Exploration Map

Millworks Lignin Parcel Integrated Planning - GP West Site
Bellingham, Washington

DATE: Sep 2020	PROJECT NO. 190239
DESIGNED BY: SJG/AAF	
DRAWN BY: PPW	FIGURE NO. 2
REVISED BY: SCC	

Path: T:\projects_8\Port_of_Bellingham\Delivered\Lignin Parcel Integrated Planning\02 Site Exploration Map.mxd



Current Exploration Phase

Soil Boring

Prior Explorations

Geotechnical Soil Boring (GeoEngineers, 2007)

Estimated Bedrock Elevation (Feet NAVD88)

Presumed Bedrock Elevation (Feet NAVD88)

Note:
Bedrock elevation contours estimated using information from W.D. Purnell and Associates (1977) and supplemented by GeoEngineers (2007) three borings on the Lignin Parcel.

0 30 60 120 Feet

MILL NORTH
TRUE NORTH
45°

Aspect CONSULTING

Bedrock Elevation Contour Map

Millworks Lignin Parcel Integrated Planning - GP West Site
Bellingham, Washington

DATE:	Sep 2020
DESIGNED BY:	SJG/AAF
DRAWN BY:	SCC
REVISED BY:	SCC
PROJECT NO.	190239
FIGURE NO.	3

Path: T:\projects_8\Port_of_Bellingham\Delivered\Lignin Parcel Integrated Planning\03 Bedrock Elevation Contour Map.mxd

Current Exploration Phase

- Soil Boring

Prior Explorations

- Monitoring Well
- Soil Boring
- Surface Soil Sample

Soil Contaminants Exceeding Cleanup Levels

- Metals
- cPAHs

Note:
Soil cleanup levels for unrestricted use, saturated soil, from Chlor-Alkali RAU Draft Cleanup Action Plan. Refer to Table 1 for soil data and cleanup levels.

0 30 60 120 Feet

MILL NORTH / TRUE NORTH 45°

Aspect CONSULTING

Distribution of Soil Contaminant Exceedances Map

Millworks Lignin Parcel Integrated Planning - GP West Site
Bellingham, Washington

DATE: Sep 2020	PROJECT NO. 190239
DESIGNED BY: SJG/AAF	
DRAWN BY: PPW	FIGURE NO. 4
REVISED BY: SCC	

Path: T:\projects_8\Port_of_Bellingham\Delivered\Lignin Parcel Integrated Planning\04 Distribution of Soil Contaminant Exceedances Map.mxd

APPENDIX A

Field Exploration Program

A. Field Exploration Program

This Appendix describes the field exploration, sampling, and sample handling protocols conducted for the environmental assessment.

A.1. Direct Push Soil Borings

Aspect subcontracted with Cascade Drilling Inc. of Woodinville, Washington, a state licensed resource protection well driller, to complete the six soil borings using a direct push (i.e., Geoprobe) rig with collection of continuous soil core from which soil samples were collected. The soil core was retrieved from the borehole in 5-foot-long disposable 1.5-inch-diameter plastic liners.

An Aspect geologist oversaw the drilling activities and visually classified the soils in accordance with ASTM Method D2488 and recorded soil descriptions, field screening results, and other relevant details (e.g., staining, debris, odors, etc.) on a boring log form. In addition to visual and olfactory observations, the field representative will screened soil samples using a photoionization detector (PID) to monitor the presence of volatile organic compounds (VOCs). Boring logs for the six new borings are included in this Appendix.

The soil samples selected for chemical analysis based on criteria presented in the Work Plan were removed from the sampler using a stainless-steel spoon and placed in a stainless-steel bowl for homogenization with the stainless-steel spoon. Gravel-sized material greater than approximately 0.5-inch was removed from the sample during mixing. A representative aliquot of the homogenized soil was then placed into certified-clean jars supplied by the analytical laboratory.

Once complete, each soil boring was properly decommissioned with hydrated granular bentonite in accordance with Chapter 173-160 WAC.

Major Division	Subdivision	Fines	Symbol	Group Name
Coarse-Grained Soils - More than 50%1 Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines	GW	Well-graded GRAVEL Well-graded GRAVEL WITH SAND
			GP	Poorly-graded GRAVEL Poorly-graded GRAVEL WITH SAND
		≥15% Fines	GM	SILTY GRAVEL SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines	SW	Well-graded SAND Well-graded SAND WITH GRAVEL
			SP	Poorly-graded SAND Poorly-graded SAND WITH GRAVEL
		≥15% Fines	SM	SILTY SAND SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND CLAYEY SAND WITH GRAVEL
Fine-Grained Soils - 50%1 or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50%		ML	SILT SANDY or GRAVELLY SILT SILT WITH SAND SILT WITH GRAVEL
			CL	LEAN CLAY SANDY or GRAVELLY LEAN CLAY LEAN CLAY WITH SAND LEAN CLAY WITH GRAVEL
			OL	ORGANIC SILT SANDY or GRAVELLY ORGANIC SILT ORGANIC SILT WITH SAND ORGANIC SILT WITH GRAVEL
	Silts and Clays Liquid Limit 50% or More		MH	ELASTIC SILT SANDY or GRAVELLY ELASTIC SILT ELASTIC SILT WITH SAND ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY SANDY or GRAVELLY FAT CLAY FAT CLAY WITH SAND FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY SANDY or GRAVELLY ORGANIC CLAY ORGANIC CLAY WITH SAND ORGANIC CLAY WITH GRAVEL
Highly Organic Soils			PT	PEAT and other mostly organic soils

"WITH SILT" or "WITH CLAY" means 5 to 15% silt and clay, denoted by a "-" in the group name; e.g., SP-SM • "SILTY" or "CLAYEY" means >15% silt and clay • "WITH SAND" or "WITH GRAVEL" means 15 to 30% sand and gravel. • "SANDY" or "GRAVELLY" means >30% sand and gravel. • "Well-graded" means approximately equal amounts of fine to coarse grain sizes • "Poorly graded" means unequal amounts of grain sizes • Group names separated by "/" means soil contains layers of the two soil types; e.g., SM/ML.

Soils were described and identified in the field in general accordance with the methods described in ASTM D2488. Where indicated in the log, soils were classified using ASTM D2487 or other laboratory tests as appropriate. Refer to the report accompanying these exploration logs for details.

1. Estimated or measured percentage by dry weight
2. (SPT) Standard Penetration Test (ASTM D1586)
3. Determined by SPT, DCPT (ASTM STP399) or other field methods. See report text for details.

GEOTECHNICAL LAB TESTS

MC	=	Natural Moisture Content
PS	=	Particle Size Distribution
FC	=	Fines Content (% < 0.075 mm)
GH	=	Hydrometer Test
AL	=	Atterberg Limits
C	=	Consolidation Test
Str	=	Strength Test
OC	=	Organic Content (% Loss by Ignition)
Comp	=	Proctor Test
K	=	Hydraulic Conductivity Test
SG	=	Specific Gravity Test

CHEMICAL LAB TESTS

Organic Chemicals

BTEX	=	Benzene, Toluene, Ethylbenzene, Xylenes
TPH-Dx	=	Diesel and Oil-Range Petroleum Hydrocarbons
TPH-G	=	Gasoline-Range Petroleum Hydrocarbons
VOCs	=	Volatile Organic Compounds
SVOCs	=	Semi-Volatile Organic Compounds
PAHs	=	Polycyclic Aromatic Hydrocarbon Compounds
PCBs	=	Polychlorinated Biphenyls

Metals

RCRA8	=	As, Ba, Cd, Cr, Pb, Hg, Se, Ag, (d = dissolved, t = total)
MTCA5	=	As, Cd, Cr, Hg, Pb (d = dissolved, t = total)
PP-13	=	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn (d=dissolved, t=total)

FIELD TESTS

PID	=	Photoionization Detector
Sheen	=	Oil Sheen Test
SPT[2]	=	Standard Penetration Test
NSPT	=	Non-Standard Penetration Test
DCPT	=	Dynamic Cone Penetration Test

COMPONENT DEFINITIONS

Descriptive Term		*Size Range and Sieve Number*
Boulders	=	Larger than 12 inches
Cobbles	=	3 inches to 12 inches
Coarse Gravel	=	3 inches to 3/4 inches
Fine Gravel	=	3/4 inches to No. 4 (4.75 mm)
Coarse Sand	=	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	=	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	=	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	=	Smaller than No. 200 (0.075 mm)

ESTIMATED[1] PERCENTAGE

% by Weight		*Modifier*	*% by Weight*		*Modifier*
<1	=	Subtrace	15 to 25	=	Little
1 to <5	=	Trace	30 to 45	=	Some
5 to 10	=	Few	>50	=	Mostly

MOISTURE CONTENT

Dry	=	Absence of moisture, dusty, dry to the touch
Slightly Moist	=	Perceptible moisture
Moist	=	Damp but no visible water
Very Moist	=	Water visible but not free draining
Wet	=	Visible free water, usually from below water table

RELATIVE DENSITY

Non-Cohesive or Coarse-Grained Soils

Density³		*SPT² Blows/Foot*	*Penetration with 1/2" Diameter Rod*
Very Loose	=	0 to 4	≥ 2'
Loose	=	5 to 10	1' to 2'
Medium Dense	=	11 to 30	3" to 1'
Dense	=	31 to 50	1" to 3"
Very Dense	=	> 50	< 1"

CONSISTENCY

Cohesive or Fine-Grained Soils

Consistency³		*SPT² Blows/Foot*	*Manual Test*
Very Soft	=	0 to 1	Penetrated >1" easily by thumb. Extrudes between thumb & fingers.
Soft	=	2 to 4	Penetrated 1/4" to 1" easily by thumb. Easily molded.
Medium Stiff	=	5 to 8	Penetrated >1/4" with effort by thumb. Molded with strong pressure.
Stiff	=	9 to 15	Indented ~1/4" with effort by thumb.
Very Stiff	=	16 to 30	Indented easily by thumbnail.
Hard	=	> 30	Indented with difficulty by thumbnail.

GEOLOGIC CONTACTS

Observed and Distinct

Observed and Gradual

Inferred

Aspect CONSULTING

Exploration Log Key

Millworks Lignin - 190239

Environmental Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
300 W Laurel St, See Map	48.7474, -122.4832 (est)	LW-SB101

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)
Cascade	Direct push rig	Percussion hammer activated continuous core	20' (est)

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
	Direct push	8/3/2020	NA	10' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Description	Depth (ft)
0	20	Boring backfilled with bentonite chips and capped at the surface with concrete.	S1	NWTPH-Dx, PAHs 8270D/SIM, Metals	PID=0	**ASPHALT** ASPHALT; 2-inches thick **FILL** SILTY SAND WITH GRAVEL (SM); moist, brown; fine to medium sand; fine, subangular gravel. Gravel obstruction in sampler.	
5	15				PID=0	GRAVEL WITH SAND (GP); moist, variable gray; medium sand; fine to coarse, subangular gravel. Brick debris. SANDY CLAY WITH GRAVEL (CL); moist, dark brown; high plasticity; medium sand; fine, subrounded gravel. Wood debris. Sandstone cobble obstruction. **BEACH/INTERTIDAL DEPOSITS** SAND (SP); moist, gray; medium sand.	5
10	10	⊽ 8/3/2020 Based on soil sample conditions.	S2	NWTPH-Dx, PAHs 8270D/SIM, Metals	PID=0	Becomes wet. Becomes stratified with CLAY (CL); high plasticity; 1" to 2" thick layers.	10
			S3	NWTPH-Dx, PAHs 8270D/SIM, Metals			
15	5					Bottom of exploration at 15 ft. bgs.	15

Legend

Sample Type
- No Soil Sample Recovery
- Continuous core 1.125" ID
- Grab sample

Water Level
- ⊽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: AAF
Approved by: EOA

Exploration Log LW-SB101
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\190239 - MILLWORKS LIGNIN PARCEL.GPJ September 9, 2020

Review Stage:DRAFT Rev.2

Aspect CONSULTING

Millworks Lignin - 190239

Environmental Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
300 W Laurel St, See Map	48.7480, -122.4835 (est)	LW-SB102

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)
Cascade	Direct push rig	Percussion hammer activated continuous core	18.5' (est)

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
	Direct push	8/3/2020	NA	7.6' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Description	Depth (ft)
0	18.5				PID=0	**ASPHALT** ASPHALT; 6-inches thick.	
		Boring backfilled with bentonite chips and capped at the surface with concrete.	S1 (grab)	NWTPH-Dx, PAHs 8270D/SIM, Metals		**FILL** SILTY SAND WITH GRAVEL (SM); slightly moist, brown; medium sand; fine to coarse, subrounded to subangular gravel; abundant oxidation mottling.	
						SILTY SAND WITH GRAVEL (SM); slightly moist, gray; medium sand; fine, subrounded gravel.	
						SILTY SAND (SM); slightly moist, dark gray; fine sand; few fine, subrounded gravel.	
	15						
5					PID=0	SILTY SAND WITH GRAVEL (SM); slightly moist, dark gray; medium sand; fine to coarse, subrounded to subangular gravel and cobbles.	5
						BEACH/INTERTIDAL DEPOSITS SAND (SP); moist, dark gray; fine sand. Becomes wet, gray.	
		▽ 8/3/2020 Based on soil sample conditions.	S2 (grab)	NWTPH-Dx, PAHs 8270D/SIM, Metals			
	10						
10					PID=0		10
			S3 (grab)	NWTPH-Dx, PAHs 8270D/SIM, Metals			
						CLAY (CL); wet, gray; high-plasticity.	
						SAND WITH SILT (SP-SM); wet, gray; medium to coarse sand; trace fine, subrounded gravel.	
	5						
15						Bottom of exploration at 15 ft. bgs.	15

Legend

Sample Type
- ◯ No Soil Sample Recovery
- Continuous core 1.125" ID
- Grab sample

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: AAF
Approved by: EOA

Exploration Log LW-SB102

Sheet 1 of 1

Aspect Consulting	Millworks Lignin - 190239			Environmental Exploration Log	
	Project Address & Site Specific Location			*Coordinates (Lat,Lon WGS84)*	*Exploration Number*
	300 W Laurel St, See Map			48.7483, -122.4833 (est)	**LW-SB103**
Contractor	*Equipment*	*Sampling Method*		*Ground Surface Elev. (NAVD88)*	
Cascade	Direct push rig	Percussion hammer activated continuous core		18' (est)	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*		*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
	Direct push	8/3/2020		NA	6.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Description	Depth (ft)
0	18				PID=0	**ASPHALT** ASPHALT; 4-inches thick.	
		Boring backfilled with bentonite chips and capped at the surface with concrete.	S1 (Grab sample)	NWTPH-Dx, PAHs 8270D/SIM, Metals		**FILL** SAND WITH SILT (SP-SM); moist, brown; medium sand.	
						SILTY SAND WITH GRAVEL (SM); very moist, dark gray; medium sand; fine to coarse, subrounded gravel and cobbles.	
	15		No Soil Sample Recovery				
5					PID=0	**BEACH/INTERTIDAL DEPOSITS** SILTY SAND WITH GRAVEL (SM); moist, brown; medium sand; fine, subrounded gravel.	5
						SAND WITH GRAVEL (SP); very moist, dark gray; fine to medium sand; fine, subrounded gravel.	
		∇ 8/3/2020 Based on soil sample conditions.				SAND (SP); wet, dark gray; fine to medium sand.	
			S2 (Grab sample)	NWTPH-Dx, PAHs 8270D/SIM, Metals			
	10		No Soil Sample Recovery				
10					PID=0		10
			S3 (Grab sample)	NWTPH-Dx, PAHs 8270D/SIM, Metals		Becomes stratified with CLAY (CL) and CLAYEY SAND (SC). Sand becomes coarse.	
	5						
			No Soil Sample Recovery				
15						Bottom of exploration at 15 ft. bgs.	15

Legend

Sample Type:
- No Soil Sample Recovery
- Continuous core 1.125" ID
- Grab sample

Water Level:
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: AAF
Approved by: EOA

Exploration Log
LW-SB103
Sheet 1 of 1

Millworks Lignin - 190239

Environmental Exploration Log

Project Address & Site Specific Location: 300 W Laurel St, See Map		*Coordinates (Lat,Lon WGS84)*: 48.7486, -122.4828 (est)	*Exploration Number*: **LW-SB104**
Contractor: Cascade	*Equipment*: Direct push rig	*Sampling Method*: Percussion hammer activated continuous core	*Ground Surface Elev. (NAVD88)*: 16.5' (est)
Operator:	*Exploration Method(s)*: Direct push	*Work Start/Completion Dates*: 8/3/2020	*Top of Casing Elev. (NAVD88)*: NA
			Depth to Water (Below GS): 2.8' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Description
0	16.5	Boring backfilled with bentonite chips and capped at the surface with concrete.			PID=0	**ASPHALT** ASPHALT; 4-inches thick.
						FILL SILTY GRAVEL WITH SAND (GM); moist, variable brown and gray; medium to coarse sand; fine to coarse, subrounded to angular gravel and cobbles; highly variable.
	15		S1	NWTPH-Dx, PAHs 8270D/SIM, Metals		
		∇ 8/3/2020				
5			S2	NWTPH-Dx, PAHs 8270D/SIM, Metals	PID=0	**BEACH/INTERTIDAL DEPOSITS** SAND (SP); wet, gray; fine sand; trace organic material.
	10					CLAY (CL); wet, gray; high-plasticity.
						SAND (SP); wet, gray; medium sand.
						GRAVELLY CLAY (CL); wet, gray; high-plasticity; fine, subrounded gravel; few medium sand.
10			S3	NWTPH-Dx, PAHs 8270D/SIM, Metals	PID=0	SAND WITH GRAVEL (SP); wet, gray; medium to coarse sand; fine to coarse, rounded to subrounded gravel.
						SANDY CLAY (CL); wet, gray; high-plasticity; fine sand.
	5					SAND (SP); wet, gray; fine to medium sand; trace shell material.
						CLAY (CL); wet, brown; high-plasticity; few fine sand; trace organics (wood debris).
						SAND (SP); wet, gray; fine to medium sand.
						Trace shells.
15						Bottom of exploration at 15 ft. bgs.
	0					

Legend

Sample Type:
- No Soil Sample Recovery
- Continuous core 1.125" ID
- Grab sample

Water Level:
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: AAF
Approved by: EOA

Exploration Log LW-SB104

Sheet 1 of 1

Millworks Lignin - 190239

Environmental Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
300 W Laurel St, See Map	48.7482, -122.4829 (est)	LW-SB105

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)
Cascade	Direct push rig	Percussion hammer activated continuous core	18.5' (est)

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
	Direct push	8/3/2020	NA	5.3' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description
0	18.5	Boring backfilled with bentonite chips and capped at the surface with concrete.			PID=0		**CONCRETE** CONCRETE; 15-inches thick.
							FILL SILTY SAND (SM); slightly moist, brown; medium sand.
			S1 (Grab sample)	NWTPH-Dx, PAHs 8270D/SIM, Metals			SILTY SAND WITH GRAVEL (SM); slightly moist, dark gray; medium sand, fine, subrounded to subangular gravel. Large rock obstruction
	15						
5		▽ 8/3/2020			PID=0		SILTY SAND WITH GRAVEL (SM); moist, gray; medium sand; fine, subrounded gravel.
							SILTY SAND (SM); moist, gray; medium sand; little organics (wood debris).
			S2 (Grab sample)	NWTPH-Dx, PAHs 8270D/SIM, Metals			**BEACH/INTERTIDAL DEPOSITS** CLAY (CL); wet, gray; medium-plasticity.
							SAND (SP); wet, gray; fine to medium sand; trace organic material.
	10						
10					PID=0		
							CLAY (CL); wet, gray; high-plasticity.
			S3 (Grab sample)	NWTPH-Dx, PAHs 8270D/SIM, Metals			SAND (SP); wet, gray; medium to coarse sand.
	5						
15							Bottom of exploration at 15 ft. bgs.

Legend

Sample Type:
- No Soil Sample Recovery
- Continuous core 1.125" ID
- Grab sample

Water Level:
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: AAF
Approved by: EOA

Exploration Log LW-SB105

Sheet 1 of 1

Millworks Lignin - 190239

Environmental Exploration Log

Project Address & Site Specific Location: 300 W Laurel St, See Map		*Coordinates (Lat,Lon WGS84)*: 48.7478, -122.4831 (est)		*Exploration Number*: **LW-SB106**
Contractor: Cascade	*Equipment*: Direct push rig	*Sampling Method*: Percussion hammer activated continuous core	*Ground Surface Elev. (NAVD88)*: 18.5' (est)	
Operator:	*Exploration Method(s)*: Direct push	*Work Start/Completion Dates*: 8/3/2020	*Top of Casing Elev. (NAVD88)*: NA	*Depth to Water (Below GS)*: 7.8' (ATD)

Exploration Completion and Notes: Boring backfilled with bentonite chips and capped at the surface with concrete. ∇ 8/3/2020 (water level at ~7.8 ft)

Depth (feet)	Elev. (feet)	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description
0	18.5			PID=0	CONCRETE	**CONCRETE** CONCRETE; 18-inches thick section. Wood debris.
1.5		S1	NWTPH-Dx, PAHs 8270D/SIM, Metals		FILL	**FILL** SILTY SAND (SM); slightly moist, gray brown; medium to coarse sand; few fine, subangular gravel. Becomes dark gray.
5				PID=0		Becomes dark brown.
6.8					BEACH/INTERTIDAL DEPOSITS	**BEACH/INTERTIDAL DEPOSITS** SAND (SP); moist, dark gray; medium sand.
7.8	10	S2	NWTPH-Dx, PAHs 8270D/SIM, Metals			SILTY SAND (SM); wet, gray; fine sand.
10				PID=0		CLAY (CL); wet, dark gray; high-plasticity.
						SAND (SP); wet, dark gray; medium sand.
		S3	NWTPH-Dx, PAHs 8270D/SIM, Metals			CLAY (CL); wet, gray; high-plasticity.
	5					SAND (SP); wet, gray; medium to coarse sand.
15						Bottom of exploration at 15 ft. bgs.

Legend

Sample Type:
- ◯ No Soil Sample Recovery
- Continuous core 1.125" ID
- Grab sample

Water Level:
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: AAF
Approved by: EOA

Exploration Log LW-SB106

Sheet 1 of 1

APPENDIX B

Data Validation Report and Laboratory Data Report

DATA VALIDATION REPORT

Lignin Parcel
Soil Sampling
August 2020
SDG 2008-031

Prepared by:

Aspect Consulting, LLC
710 Second Ave, Suite 550
Seattle, WA 98104

Project No. 190239 • August 2020

V:\190239 Port of Bellingham Millworks Project\Deliverables\Report of Findings_Lignin Parcel\Appendix B - Lignin Parcel Soil 2020-08 DV Report.docx

Contents

1 Introduction

This report summarizes the findings of the United States Environmental Protection Agency (USEPA) Stage 2A data validation performed on analytical data for soil samples collected in August 2020 for the Lignin Parcel project. This data quality review is divided into sections by sample delivery group (SDG). A complete list of samples and analyses for each SDG is provided in the Sample Index at the beginning of each section.

Samples were sent to OnSite Environmental in Redmond, Washington. The analytical methods are summarized in Table 1 below:

Table 1. Analytical Methods

Analysis	Method	Lab	Validation Level
Diesel and Heavy Oil	NWTPH-Dx	OnSite Environmental	2A
PAHs	SW8270E-SIM	OnSite Environmental	2A
Metals	SW6010D	OnSite Environmental	2A
Mercury	SW7471B	OnSite Environmental	2A

Data assigned a J/UJ qualifier (estimated) may be used for site evaluation purposes but the reasons for qualification should be considered when interpreting sample concentrations. Values without qualification meet all data measurement quality objectives and are suitable for use.

Data qualifier definitions and a summary table of the qualified data are included in the Qualified Data Summary at the end of this report. Data qualifiers have been incorporated into the project chemistry database to reflect the validation in this report.

2 Data Validation Findings for SDG 2008-031

Samples in this SDG, and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review for this SDG by analyte group (analysis).

Table 2. Sample Index

Sample Name	Sample Date	NWTPH-Dx	SW8270E-SIM	SW6010D	SW7471B
LW-SB101-S1-1.0	8/3/2020	X	X	X	X
LW-SB101-S2-10.5	8/3/2020	X	X	X	X
LW-SB101-S3-13.5	8/3/2020	X	X	X	X
LW-SB102-S1-1.0	8/3/2020	X	X	X	X
LW-SB102-S2-8.0	8/3/2020	X	X	X	X
LW-SB102-S3-11.0	8/3/2020	X	X	X	X
LW-SB103-S1-1.0	8/3/2020	X	X	X	X

Sample Name	Sample Date	NWTPH-Dx	SW8270E-SIM	SW6010D	SW7471B
LW-SB103-S2-7.3	8/3/2020	X	X	X	X
LW-SB103-S3-11.0	8/3/2020	X	X	X	X
LW-SB104-S1-1.5	8/3/2020	X	X	X	X
LW-SB104-S2-5.0	8/3/2020	X	X	X	X
LW-SB104-S3-10.0	8/3/2020	X	X	X	X
LW-SB105-S1-1.5	8/3/2020	X	X	X	X
LW-SB105-S2-7.0	8/3/2020	X	X	X	X
LW-SB105-S3-12.0	8/3/2020	X	X	X	X
LW-SB106-S1-2.0	8/3/2020	X	X	X	X
LW-SB106-S2-8.0	8/3/2020	X	X	X	X
LW-SB106-S3-11.5	8/3/2020	X	X	X	X

2.1 Sample Receipt and Preservation

All samples were received in good condition and in the correct containers. Temperature upon receipt was within standard acceptable range.

2.2 Diesel and Heavy Oil (NWTPH-Dx)

2.2.1 Holding Times

Samples were analyzed within the requisite holding time. No qualification or action was needed.

2.2.2 Method Blanks

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

2.2.3 Surrogates

All surrogate %R values were within laboratory specified control limits. No qualification or action was needed.

2.2.4 Laboratory Control Samples

All LCS and %R were within the laboratory specified control limits. No qualification or action was needed. Note that OnSite does not normally include LCS data for NWTPH-Dx analyses in the report. The lab provided this data via email.

2.2.5 Lab Duplicates

All LD RPD were within the laboratory specified control limits. No qualification or action was needed.

2.2.6 Other

The laboratory flagged the Diesel Range Organics result in sample LW-SB102-S1-1.0 as “N” to indicate that hydrocarbons in the lube oil range are impacting the diesel range result. The result was qualified as estimated (J).

2.2.7 Overall Assessment

Accuracy was acceptable based on the LCS %R. Precision was acceptable based on the LD RPD values. The data are of known quality and are acceptable for use as qualified.

2.3 PAHs (SW8270E-SIM)

2.3.1 Holding Times

Samples were analyzed within the requisite holding time. No qualification or action was needed.

2.3.2 Method Blanks

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

2.3.3 Surrogates

All surrogate %R values were within laboratory specified control limits. No qualification or action was needed.

2.3.4 Matrix Spikes/Matrix Spike Duplicates

All MS and MSD %R and RPD were within the laboratory specified control limits. No qualification or action was needed.

2.3.5 Overall Assessment

Accuracy was acceptable based on the MS/MSD %R. Precision was acceptable based on the MSD RPD values. The data are of known quality and are acceptable for use as qualified.

2.4 Metals (SW6010D, SW7471B)

2.4.1 Holding Times

Samples were analyzed within the requisite holding time. No qualification or action was needed.

2.4.2 Method Blanks

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

2.4.3 Laboratory Control Samples

All LCS %R were within the laboratory specified control limits. No qualification or action was needed.

2.4.4 Overall Assessment

Accuracy was acceptable based on the LCS %R. The data are of known quality and are acceptable for use as qualified.

3 Qualified Data Summary

Qualified sample results are listed below. Results just flagged non-detect (U) by lab with no further qualification necessary are not listed.

Table 3. Qualified Data Summary

Sample ID	Method	Analyte	Qualifier	Reason
LW-SB102-S1-1.0	NWTPH-Dx	Diesel Range Organics	J	Overlap from lube oil range

Table 4. Data Qualifier Definitions

Data Qualifier	Definition
J	The analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
U	The analyte was analyzed for but was considered not detected at the reporting limit or reported value.
UJ	The analyte was analyzed for, and the associated quantitation limit was an estimated value.

4 Acronyms and Definitions

%D – Percent Difference
%R – Percent Recovery
ASTM – American Standard Test Method
COC – Chain of Custody
EB – Equipment Blank
EPA – Environmental Protection Agency
FB – Field Blank
FD – Field Duplicate
HCID – Hydrocarbon Identification
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
LD – Laboratory Duplicate
MB – Method Blank
MDL – Method Detection Limit
MS – Matrix Spike
MSD – Matrix Spike Duplicate
NWTPH – Northwest Total Petroleum Hydrocarbon
PCB – Polychlorinated Biphenyl
PFAS – Polyfluoroalkyl Substances
PPCP – Pharmaceuticals and Personal Care Products
QAPP – Quality Assurance Project Plan
QC – Quality Control
RL – Reporting Limit
RPD – Relative Percent Difference
SDG – Sample Delivery Group
SM – Standard Methods
SVOC – Semi-Volatile Organic Compound
SW – Solid Waste
TB – Trip Blank
TCLP – Toxicity Characteristic Leaching Procedure
TPH – Total Petroleum Hydrocarbon
VOC – Volatile Organic Compound

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

August 13, 2020

Steve Germiat
Aspect Consulting
Dexter Horton Building
710 2nd Avenue, Suit 550
Seattle, WA 98104

Re: Analytical Data for Project 190239
Laboratory Reference No. 2008-031

Dear Steve:

Enclosed are the analytical results and associated quality control data for samples submitted on August 5, 2020.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

Case Narrative

Samples were collected on August 3, 2020 and received by the laboratory on August 5, 2020. They were maintained at the laboratory at a temperature of 2^oC to 6^oC.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB101-S1-1.0**					
Laboratory ID:	08-031-01					
Diesel Range Organics	**ND**	26	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil	**120**	53	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*101*	*50-150*				
Client ID:	**LW-SB101-S2-10.5**					
Laboratory ID:	08-031-02					
Diesel Range Organics	**ND**	31	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	62	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*96*	*50-150*				
Client ID:	**LW-SB101-S3-13.5**					
Laboratory ID:	08-031-03					
Diesel Range Organics	**ND**	30	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	60	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*98*	*50-150*				
Client ID:	**LW-SB102-S1-1.0**					
Laboratory ID:	08-031-04					
Diesel Range Organics	**31**	27	NWTPH-Dx	8-7-20	8-7-20	N
Lube Oil	**770**	54	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*105*	*50-150*				
Client ID:	**LW-SB102-S2-8.0**					
Laboratory ID:	08-031-05					
Diesel Range Organics	**ND**	31	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	61	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*96*	*50-150*				
Client ID:	**LW-SB102-S3-11.0**					
Laboratory ID:	08-031-06					
Diesel Range Organics	**ND**	32	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	64	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*92*	*50-150*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB103-S1-1.0**					
Laboratory ID:	08-031-07					
Diesel Range Organics	**ND**	26	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	53	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*94*	*50-150*				
Client ID:	**LW-SB103-S2-7.3**					
Laboratory ID:	08-031-08					
Diesel Range Organics	**ND**	30	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	61	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*98*	*50-150*				
Client ID:	**LW-SB103-S3-11.0**					
Laboratory ID:	08-031-09					
Diesel Range Organics	**ND**	30	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	60	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*84*	*50-150*				
Client ID:	**LW-SB104-S1-1.5**					
Laboratory ID:	08-031-10					
Diesel Range Organics	**29**	28	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil	**170**	56	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*91*	*50-150*				
Client ID:	**LW-SB104-S2-5.0**					
Laboratory ID:	08-031-11					
Diesel Range Organics	**ND**	31	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	63	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*91*	*50-150*				
Client ID:	**LW-SB104-S3-10.0**					
Laboratory ID:	08-031-12					
Diesel Range Organics	**ND**	37	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil	**76**	75	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*86*	*50-150*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB105-S1-1.5**					
Laboratory ID:	08-031-13					
Diesel Range Organics	**ND**	27	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	54	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*92*	*50-150*				
Client ID:	**LW-SB105-S2-7.0**					
Laboratory ID:	08-031-14					
Diesel Range Organics	**ND**	33	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	65	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*91*	*50-150*				
Client ID:	**LW-SB105-S3-12.0**					
Laboratory ID:	08-031-15					
Diesel Range Organics	**ND**	33	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	65	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*101*	*50-150*				
Client ID:	**LW-SB106-S1-2.0**					
Laboratory ID:	08-031-16					
Diesel Range Organics	**ND**	34	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	68	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*96*	*50-150*				
Client ID:	**LW-SB106-S2-8.0**					
Laboratory ID:	08-031-17					
Diesel Range Organics	**ND**	32	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	63	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*97*	*50-150*				
Client ID:	**LW-SB106-S3-11.5**					
Laboratory ID:	08-031-18					
Diesel Range Organics	**ND**	30	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	60	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*91*	*50-150*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

DIESEL AND HEAVY OIL RANGE ORGANICS
NWTPH-Dx
QUALITY CONTROL

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0807S2					
Diesel Range Organics	**ND**	25	NWTPH-Dx	8-7-20	8-7-20	
Lube Oil Range Organics	**ND**	50	NWTPH-Dx	8-7-20	8-7-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*108*	*50-150*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	08-031-07										
	ORIG	DUP									
Diesel Range	**ND**	**ND**	NA	NA		NA		NA	NA	NA	
Lube Oil Range	**ND**	**ND**	NA	NA		NA		NA	NA	NA	
Surrogate:											
o-Terphenyl						*94*	*92*	*50-150*			

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB101-S1-1.0**					
Laboratory ID:	08-031-01					
Naphthalene	**0.060**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**0.074**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**0.050**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**0.065**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**0.45**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**0.14**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**0.57**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**0.59**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**0.32**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**0.48**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**0.64**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**0.16**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**0.33**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**0.23**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**0.046**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**0.24**	0.035	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*73*	*46 - 113*				
Pyrene-d10	*72*	*45 - 114*				
Terphenyl-d14	*78*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB101-S2-10.5**					
Laboratory ID:	08-031-02					
Naphthalene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*73*	*46 - 113*				
Pyrene-d10	*70*	*45 - 114*				
Terphenyl-d14	*70*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB101-S3-13.5**					
Laboratory ID:	08-031-03					
Naphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*67*	*46 - 113*				
Pyrene-d10	*64*	*45 - 114*				
Terphenyl-d14	*70*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB102-S1-1.0**					
Laboratory ID:	08-031-04					
Naphthalene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**0.089**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**0.14**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**0.17**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**0.044**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**0.058**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**0.070**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**0.051**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**0.040**	0.036	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*81*	*46 - 113*				
Pyrene-d10	*73*	*45 - 114*				
Terphenyl-d14	*79*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB102-S2-8.0**					
Laboratory ID:	08-031-05					
Naphthalene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*67*	*46 - 113*				
Pyrene-d10	*72*	*45 - 114*				
Terphenyl-d14	*72*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB102-S3-11.0**					
Laboratory ID:	08-031-06					
Naphthalene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0085	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*70*	*46 - 113*				
Pyrene-d10	*70*	*45 - 114*				
Terphenyl-d14	*78*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB103-S1-1.0**					
Laboratory ID:	08-031-07					
Naphthalene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0070	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*76*	*46 - 113*				
Pyrene-d10	*74*	*45 - 114*				
Terphenyl-d14	*80*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB103-S2-7.3**					
Laboratory ID:	08-031-08					
Naphthalene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0081	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*75*	*46 - 113*				
Pyrene-d10	*72*	*45 - 114*				
Terphenyl-d14	*76*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB103-S3-11.0**					
Laboratory ID:	08-031-09					
Naphthalene	**0.014**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**0.069**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**0.014**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*70*	*46 - 113*				
Pyrene-d10	*74*	*45 - 114*				
Terphenyl-d14	*75*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB104-S1-1.5**					
Laboratory ID:	08-031-10					
Naphthalene	**0.041**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**0.054**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**0.030**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**0.0087**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**0.072**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**0.013**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**0.043**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**0.042**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**0.016**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**0.024**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**0.020**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**0.012**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**0.010**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**0.011**	0.0075	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*65*	*46 - 113*				
Pyrene-d10	*62*	*45 - 114*				
Terphenyl-d14	*68*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB104-S2-5.0**					
Laboratory ID:	08-031-11					
Naphthalene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0083	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*66*	*46 - 113*				
Pyrene-d10	*71*	*45 - 114*				
Terphenyl-d14	*75*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB104-S3-10.0**					
Laboratory ID:	08-031-12					
Naphthalene	**0.013**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*64*	*46 - 113*				
Pyrene-d10	*63*	*45 - 114*				
Terphenyl-d14	*68*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB105-S1-1.5**					
Laboratory ID:	08-031-13					
Naphthalene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0072	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*71*	*46 - 113*				
Pyrene-d10	*65*	*45 - 114*				
Terphenyl-d14	*71*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB105-S2-7.0**					
Laboratory ID:	08-031-14					
Naphthalene	**0.058**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**0.027**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**0.019**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**0.020**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*54*	*46 - 113*				
Pyrene-d10	*55*	*45 - 114*				
Terphenyl-d14	*58*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB105-S3-12.0**					
Laboratory ID:	08-031-15					
Naphthalene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0087	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*73*	*46 - 113*				
Pyrene-d10	*74*	*45 - 114*				
Terphenyl-d14	*76*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB106-S1-2.0**					
Laboratory ID:	08-031-16					
Naphthalene	**0.24**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**0.089**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**0.079**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**0.033**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**0.13**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**0.040**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**0.027**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**0.021**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**0.014**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0091	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*62*	*46 - 113*				
Pyrene-d10	*63*	*45 - 114*				
Terphenyl-d14	*77*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB106-S2-8.0**					
Laboratory ID:	08-031-17					
Naphthalene	**0.015**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0084	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*68*	*46 - 113*				
Pyrene-d10	*68*	*45 - 114*				
Terphenyl-d14	*69*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB106-S3-11.5**					
Laboratory ID:	08-031-18					
Naphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0080	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*74*	*46 - 113*				
Pyrene-d10	*71*	*45 - 114*				
Terphenyl-d14	*73*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM
QUALITY CONTROL

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0806S1					
Naphthalene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
2-Methylnaphthalene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
1-Methylnaphthalene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthylene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Acenaphthene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Fluorene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Phenanthrene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Anthracene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Fluoranthene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Pyrene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]anthracene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Chrysene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[b]fluoranthene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo(j,k)fluoranthene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[a]pyrene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Dibenz[a,h]anthracene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Benzo[g,h,i]perylene	**ND**	0.0067	EPA 8270E/SIM	8-6-20	8-6-20	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*77*	*46 - 113*				
Pyrene-d10	*78*	*45 - 114*				
Terphenyl-d14	*80*	*49 - 121*				

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

PAHs EPA 8270E/SIM
QUALITY CONTROL

Matrix: Soil
Units: mg/Kg

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	08-031-07										
	MS	MSD	MS	MSD		MS	MSD				
Naphthalene	**0.0689**	**0.0737**	0.0833	0.0833	ND	83	88	51 - 115	7	26	
Acenaphthylene	**0.0693**	**0.0730**	0.0833	0.0833	ND	83	88	53 - 121	5	24	
Acenaphthene	**0.0705**	**0.0761**	0.0833	0.0833	ND	85	91	52 - 121	8	25	
Fluorene	**0.0698**	**0.0724**	0.0833	0.0833	ND	84	87	58 - 127	4	23	
Phenanthrene	**0.0712**	**0.0723**	0.0833	0.0833	ND	85	87	46 - 129	2	28	
Anthracene	**0.0729**	**0.0731**	0.0833	0.0833	ND	88	88	57 - 124	0	21	
Fluoranthene	**0.0715**	**0.0700**	0.0833	0.0833	ND	86	84	46 - 136	2	29	
Pyrene	**0.0685**	**0.0676**	0.0833	0.0833	ND	82	81	41 - 136	1	32	
Benzo[a]anthracene	**0.0906**	**0.0857**	0.0833	0.0833	ND	109	103	56 - 136	6	25	
Chrysene	**0.0750**	**0.0767**	0.0833	0.0833	ND	90	92	49 - 130	2	22	
Benzo[b]fluoranthene	**0.0758**	**0.0708**	0.0833	0.0833	ND	91	85	51 - 135	7	26	
Benzo(j,k)fluoranthene	**0.0733**	**0.0726**	0.0833	0.0833	ND	88	87	56 - 124	1	23	
Benzo[a]pyrene	**0.0762**	**0.0758**	0.0833	0.0833	ND	91	91	54 - 133	1	26	
Indeno(1,2,3-c,d)pyrene	**0.0805**	**0.0767**	0.0833	0.0833	ND	97	92	52 - 134	5	20	
Dibenz[a,h]anthracene	**0.0769**	**0.0742**	0.0833	0.0833	ND	92	89	58 - 127	4	17	
Benzo[g,h,i]perylene	**0.0772**	**0.0745**	0.0833	0.0833	ND	93	89	54 - 129	4	21	
Surrogate:											
2-Fluorobiphenyl						*73*	*78*	*46 - 113*			
Pyrene-d10						*74*	*72*	*45 - 114*			
Terphenyl-d14						*78*	*78*	*49 - 121*			

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB101-S1-1.0**					
Laboratory ID:	08-031-01					
Arsenic	**ND**	10	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.52	EPA 6010D	8-5-20	8-5-20	
Chromium	**21**	0.52	EPA 6010D	8-5-20	8-5-20	
Copper	**24**	1.0	EPA 6010D	8-5-20	8-5-20	
Lead	**120**	5.2	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.26	EPA 7471B	8-7-20	8-7-20	
Nickel	**18**	2.6	EPA 6010D	8-5-20	8-5-20	
Zinc	**130**	2.6	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB101-S2-10.5**					
Laboratory ID:	08-031-02					
Arsenic	**ND**	12	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.62	EPA 6010D	8-5-20	8-5-20	
Chromium	**17**	0.62	EPA 6010D	8-5-20	8-5-20	
Copper	**10**	1.2	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.2	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.31	EPA 7471B	8-7-20	8-7-20	
Nickel	**22**	3.1	EPA 6010D	8-5-20	8-5-20	
Zinc	**36**	3.1	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB101-S3-13.5**					
Laboratory ID:	08-031-03					
Arsenic	**ND**	12	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.60	EPA 6010D	8-5-20	8-5-20	
Chromium	**29**	0.60	EPA 6010D	8-5-20	8-5-20	
Copper	**25**	1.2	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.0	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.30	EPA 7471B	8-7-20	8-7-20	
Nickel	**34**	3.0	EPA 6010D	8-5-20	8-5-20	
Zinc	**44**	3.0	EPA 6010D	8-5-20	8-5-20	

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB102-S1-1.0**					
Laboratory ID:	08-031-04					
Arsenic	**ND**	11	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.54	EPA 6010D	8-5-20	8-5-20	
Chromium	**31**	0.54	EPA 6010D	8-5-20	8-5-20	
Copper	**34**	1.1	EPA 6010D	8-5-20	8-5-20	
Lead	**74**	5.4	EPA 6010D	8-5-20	8-5-20	
Mercury	**1.2**	0.54	EPA 7471B	8-7-20	8-7-20	
Nickel	**34**	2.7	EPA 6010D	8-5-20	8-5-20	
Zinc	**65**	2.7	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB102-S2-8.0**					
Laboratory ID:	08-031-05					
Arsenic	**ND**	12	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.61	EPA 6010D	8-5-20	8-5-20	
Chromium	**13**	0.61	EPA 6010D	8-5-20	8-5-20	
Copper	**5.8**	1.2	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.1	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.30	EPA 7471B	8-7-20	8-7-20	
Nickel	**14**	3.0	EPA 6010D	8-5-20	8-5-20	
Zinc	**16**	3.0	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB102-S3-11.0**					
Laboratory ID:	08-031-06					
Arsenic	**ND**	13	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.64	EPA 6010D	8-5-20	8-5-20	
Chromium	**17**	0.64	EPA 6010D	8-5-20	8-5-20	
Copper	**6.4**	1.3	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.4	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.32	EPA 7471B	8-7-20	8-7-20	
Nickel	**17**	3.2	EPA 6010D	8-5-20	8-5-20	
Zinc	**21**	3.2	EPA 6010D	8-5-20	8-5-20	

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB103-S1-1.0**					
Laboratory ID:	08-031-07					
Arsenic	**ND**	11	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.53	EPA 6010D	8-5-20	8-5-20	
Chromium	**14**	0.53	EPA 6010D	8-5-20	8-5-20	
Copper	**23**	1.1	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	5.3	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.26	EPA 7471B	8-7-20	8-7-20	
Nickel	**17**	2.6	EPA 6010D	8-5-20	8-5-20	
Zinc	**51**	2.6	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB103-S2-7.3**					
Laboratory ID:	08-031-08					
Arsenic	**ND**	12	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.60	EPA 6010D	8-5-20	8-5-20	
Chromium	**17**	0.60	EPA 6010D	8-5-20	8-5-20	
Copper	**14**	1.2	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.0	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.30	EPA 7471B	8-7-20	8-7-20	
Nickel	**24**	3.0	EPA 6010D	8-5-20	8-5-20	
Zinc	**63**	3.0	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB103-S3-11.0**					
Laboratory ID:	08-031-09					
Arsenic	**ND**	12	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.60	EPA 6010D	8-5-20	8-5-20	
Chromium	**26**	0.60	EPA 6010D	8-5-20	8-5-20	
Copper	**16**	1.2	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.0	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.30	EPA 7471B	8-7-20	8-7-20	
Nickel	**23**	3.0	EPA 6010D	8-5-20	8-5-20	
Zinc	**34**	3.0	EPA 6010D	8-5-20	8-5-20	

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB104-S1-1.5**					
Laboratory ID:	08-031-10					
Arsenic	**ND**	11	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.56	EPA 6010D	8-5-20	8-5-20	
Chromium	**58**	0.56	EPA 6010D	8-5-20	8-5-20	
Copper	**30**	1.1	EPA 6010D	8-5-20	8-5-20	
Lead	**18**	5.6	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.28	EPA 7471B	8-7-20	8-7-20	
Nickel	**32**	2.8	EPA 6010D	8-5-20	8-5-20	
Zinc	**55**	2.8	EPA 6010D	8-5-20	8-5-20	
Client ID:	**LW-SB104-S2-5.0**					
Laboratory ID:	08-031-11					
Arsenic	**ND**	13	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.63	EPA 6010D	8-5-20	8-5-20	
Chromium	**16**	0.63	EPA 6010D	8-5-20	8-5-20	
Copper	**7.0**	1.3	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.3	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.31	EPA 7471B	8-7-20	8-7-20	
Nickel	**15**	3.1	EPA 6010D	8-5-20	8-5-20	
Zinc	**18**	3.1	EPA 6010D	8-5-20	8-5-20	
Client ID:	**LW-SB104-S3-10.0**					
Laboratory ID:	08-031-12					
Arsenic	**ND**	15	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.75	EPA 6010D	8-5-20	8-5-20	
Chromium	**38**	0.75	EPA 6010D	8-5-20	8-5-20	
Copper	**35**	1.5	EPA 6010D	8-5-20	8-5-20	
Lead	**19**	7.5	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.37	EPA 7471B	8-7-20	8-7-20	
Nickel	**42**	3.7	EPA 6010D	8-5-20	8-5-20	
Zinc	**75**	3.7	EPA 6010D	8-5-20	8-5-20	

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB105-S1-1.5**					
Laboratory ID:	08-031-13					
Arsenic	**ND**	11	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.54	EPA 6010D	8-5-20	8-5-20	
Chromium	**19**	0.54	EPA 6010D	8-5-20	8-5-20	
Copper	**16**	1.1	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	5.4	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.27	EPA 7471B	8-7-20	8-7-20	
Nickel	**25**	2.7	EPA 6010D	8-5-20	8-5-20	
Zinc	**26**	2.7	EPA 6010D	8-5-20	8-5-20	

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB105-S2-7.0**					
Laboratory ID:	08-031-14					
Arsenic	**ND**	13	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.65	EPA 6010D	8-5-20	8-5-20	
Chromium	**26**	0.65	EPA 6010D	8-5-20	8-5-20	
Copper	**49**	1.3	EPA 6010D	8-5-20	8-5-20	
Lead	**66**	6.5	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.33	EPA 7471B	8-7-20	8-7-20	
Nickel	**33**	3.3	EPA 6010D	8-5-20	8-5-20	
Zinc	**110**	3.3	EPA 6010D	8-5-20	8-5-20	

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB105-S3-12.0**					
Laboratory ID:	08-031-15					
Arsenic	**ND**	13	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.65	EPA 6010D	8-5-20	8-5-20	
Chromium	**15**	0.65	EPA 6010D	8-5-20	8-5-20	
Copper	**10**	1.3	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.5	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.33	EPA 7471B	8-7-20	8-7-20	
Nickel	**22**	3.3	EPA 6010D	8-5-20	8-5-20	
Zinc	**22**	3.3	EPA 6010D	8-5-20	8-5-20	

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LW-SB106-S1-2.0**					
Laboratory ID:	08-031-16					
Arsenic	**ND**	14	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.68	EPA 6010D	8-5-20	8-5-20	
Chromium	**150**	0.68	EPA 6010D	8-5-20	8-5-20	
Copper	**650**	1.4	EPA 6010D	8-5-20	8-5-20	
Lead	**140**	6.8	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.34	EPA 7471B	8-7-20	8-7-20	
Nickel	**28**	3.4	EPA 6010D	8-5-20	8-5-20	
Zinc	**230**	3.4	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB106-S2-8.0**					
Laboratory ID:	08-031-17					
Arsenic	**ND**	13	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.63	EPA 6010D	8-5-20	8-5-20	
Chromium	**17**	0.63	EPA 6010D	8-5-20	8-5-20	
Copper	**7.7**	1.3	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.3	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.32	EPA 7471B	8-7-20	8-7-20	
Nickel	**17**	3.2	EPA 6010D	8-5-20	8-5-20	
Zinc	**22**	3.2	EPA 6010D	8-5-20	8-5-20	

Client ID:	**LW-SB106-S3-11.5**					
Laboratory ID:	08-031-18					
Arsenic	**ND**	12	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.60	EPA 6010D	8-5-20	8-5-20	
Chromium	**14**	0.60	EPA 6010D	8-5-20	8-5-20	
Copper	**13**	1.2	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	6.0	EPA 6010D	8-5-20	8-5-20	
Mercury	**ND**	0.30	EPA 7471B	8-7-20	8-7-20	
Nickel	**21**	3.0	EPA 6010D	8-5-20	8-5-20	
Zinc	**28**	3.0	EPA 6010D	8-5-20	8-5-20	

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B
QUALITY CONTROL

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0805SM2					
Arsenic	**ND**	10	EPA 6010D	8-5-20	8-5-20	
Cadmium	**ND**	0.50	EPA 6010D	8-5-20	8-5-20	
Chromium	**ND**	0.50	EPA 6010D	8-5-20	8-5-20	
Copper	**ND**	1.0	EPA 6010D	8-5-20	8-5-20	
Lead	**ND**	5.0	EPA 6010D	8-5-20	8-5-20	
Nickel	**ND**	2.5	EPA 6010D	8-5-20	8-5-20	
Zinc	**ND**	2.5	EPA 6010D	8-5-20	8-5-20	
Laboratory ID:	MB0807S1					
Mercury	**ND**	0.25	EPA 7471B	8-7-20	8-7-20	

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

TOTAL METALS
EPA 6010D/7471B
QUALITY CONTROL

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	07-031-07										
	ORIG	DUP									
Arsenic	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Chromium	**12.9**	**11.9**	NA	NA		NA		NA	8	20	
Copper	**21.7**	**22.5**	NA	NA		NA		NA	3	20	
Lead	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Nickel	**16.2**	**16.0**	NA	NA		NA		NA	1	20	
Zinc	**48.5**	**50.9**	NA	NA		NA		NA	5	20	
Laboratory ID:	07-031-07										
Mercury	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	07-031-07										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**82.4**	**85.3**	100	100	ND	**82**	**85**	75-125	3	20	
Cadmium	**42.1**	**43.4**	50.0	50.0	ND	**84**	**87**	75-125	3	20	
Chromium	**101**	**102**	100	100	12.9	**88**	**89**	75-125	0	20	
Copper	**64.6**	**66.7**	50.0	50.0	21.7	**86**	**90**	75-125	3	20	
Lead	**230**	**234**	250	250	ND	**92**	**93**	75-125	2	20	
Nickel	**103**	**105**	100	100	16.2	**87**	**89**	75-125	2	20	
Zinc	**133**	**137**	100	100	48.5	**84**	**89**	75-125	4	20	
Laboratory ID:	07-031-07										
Mercury	**0.483**	**0.544**	0.500	0.500	0.0255	**92**	**104**	80-120	12	20	
SPIKE BLANK											
Laboratory ID:	SB0805SM2										
Arsenic	**83.6**		100		N/A	**84**		80-120			
Cadmium	**42.8**		50.0		N/A	**86**		80-120			
Chromium	**90.9**		100		N/A	**91**		80-120			
Copper	**44.9**		50.0		N/A	**90**		80-120			
Lead	**243**		250		N/A	**97**		80-120			
Nickel	**93.9**		100		N/A	**94**		80-120			
Zinc	**85.2**		100		N/A	**85**		80-120			
Laboratory ID:	SB0807S1										
Mercury	**0.512**		0.500		N/A	**102**		80-120			

Date of Report: August 13, 2020
Samples Submitted: August 5, 2020
Laboratory Reference: 2008-031
Project: 190239

% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
LW-SB101-S1-1.0	08-031-01	**5**	8-6-20
LW-SB101-S2-10.5	08-031-02	**19**	8-6-20
LW-SB101-S3-13.5	08-031-03	**17**	8-6-20
LW-SB102-S1-1.0	08-031-04	**7**	8-6-20
LW-SB102-S2-8.0	08-031-05	**18**	8-6-20
LW-SB102-S3-11.0	08-031-06	**21**	8-6-20
LW-SB103-S1-1.0	08-031-07	**5**	8-6-20
LW-SB103-S2-7.3	08-031-08	**17**	8-6-20
LW-SB103-S3-11.0	08-031-09	**16**	8-6-20
LW-SB104-S1-1.5	08-031-10	**11**	8-6-20
LW-SB104-S2-5.0	08-031-11	**20**	8-6-20
LW-SB104-S3-10.0	08-031-12	**33**	8-6-20
LW-SB105-S1-1.5	08-031-13	**7**	8-6-20
LW-SB105-S2-7.0	08-031-14	**23**	8-6-20
LW-SB105-S3-12.0	08-031-15	**23**	8-6-20
LW-SB106-S1-2.0	08-031-16	**27**	8-6-20
LW-SB106-S2-8.0	08-031-17	**21**	8-6-20
LW-SB106-S3-11.5	08-031-18	**17**	8-6-20

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical ____________.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

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Chain of Custody

Page 1 of 2

Laboratory Number: 08-031

Company: Aspect
Project Number: 190239
Project Name: Lignin Parcel
Project Manager: S. Germiat
Sampled by: A. Fitts

Turnaround Request (in working days) (Check One)
- ☐ Same Day ☐ 1 Day
- ☐ 2 Days ☐ 3 Days
- ☒ Standard (7 Days)
- ☐ ________ (other)

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	~~Organophosphorus Pesticides 8270D/SIM~~	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	As, Cd, Cr, Cu, Pb, Ni, Zn	Hg			% Moisture
1	LW-SB101-S1-1.0	8/3/20	8:45	S	1				X					X			~~X~~						X	X			0
2	LW-SB101-S2-10.5	8/3/20	8:50	S					X					X			~~X~~						X	X			
3	LW-SB101-S3-13.5	8/3/20	8:55	S					X					X			~~X~~						X	X			
4	LW-SB102-S1-1.0	8/3/20	12:23	S					X					X			~~X~~						X	X			
5	LW-SB102-S2-8.0	8/3/20	12:40	S					X					X			~~X~~						X	X			
6	LW-SB102-S3-11.0	8/3/20	12:42	S					X					X			~~X~~						X	X			
7	LW-SB103-S1-1.0	8/3/20	11:46	S					X					X			~~X~~						X	X			
8	LW-SB103-S2-7.3	8/3/20	11:48	S					X					X			~~X~~						X	X			
9	LW-SB103-S3-11.0	8/3/20	11:51	S					X					X			~~X~~						X	X			
10	LW-SB104-S1-1.5	8/3/20	13:19	S					X					X			~~X~~						X	X			

	Signature	Company	Date	Time
Relinquished	[signature]	Aspect	8/4/20	11:30
Received	[signature]	OSE	8/5/20	1155
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

No pesticide analysis

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Chain of Custody

Laboratory Number: 08-031

Company: Aspect
Project Number: 190239
Project Name: Lignin Parcel
Project Manager: S. Germiat
Sampled by: A. Fitts

Turnaround Request (in working days) (Check One)
- [ ] Same Day
- [ ] 1 Day
- [ ] 2 Days
- [ ] 3 Days
- [x] Standard (7 Days)
- [ ] ______ (other)

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	~~Organophosphorus Pesticides 8270D/SIM~~	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	As, Cd, Cr, Cu, Pb, Ni, Zn	Hg			% Moisture
11	LW-SB104-S2-5.0	8/3/20	13:29	S	1				X					X			~~X~~						X	X			X
12	LW-SB104-S3-10.0	8/3/20	13:43	S					X					X			~~X~~						X	X			
13	LW-SB105-S1-1.5	8/3/20	10:43	S					X					X			~~X~~						X	X			
14	LW-SB105-S2-7.0	8/3/20	10:46	S					X					X			~~X~~						X	X			
15	LW-SB105-S3-12.0	8/3/20	10:48	S					X					X			~~X~~						X	X			
16	LW-SB106-S1-2.0	8/3/20	9:51	S					X					X			~~X~~						X	X			
17	LW-SB106-S2-8.0	8/3/20	9:55	S					X					X			~~X~~						X	X			
18	LW-SB106-S3-11.5	8/3/20	9:59	S					X					X			~~X~~						X	X			

	Signature	Company	Date	Time
Relinquished	[signature]	Aspect	8/4/20	11:30
Received	[signature]	OSE	8/5/20	1155
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions:
No Pesticide analysis

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐