

PHASE II ENVIRONMENTAL ASSESSMENT

7.66-Acre Rural Residential Property
24716 SW Grand Ronde Road
Grand Ronde, Yamhill County, Oregon

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TABLE OF CONTENTS

1.0	SUMMARY OF FINDINGS	1
2.0	INTRODUCTION	4
3.0	BACKGROUND	4
3.1	Subject Property Description	4
3.2	Subject Property and Surrounding Property History	4
3.3	HAI Phase I Environmental Site Assessment (2022)	5
4.0	FIELD ACTIVITIES	6
4.1	Geophysical Survey	6
4.2	Subsurface Investigation	7
4.2.1	Subsurface Drilling Procedures	7
4.2.2	Soil Sampling and Screening Procedures	8
4.2.3	Groundwater Sampling Procedures	9
4.2.4	Decontamination Procedures	10
4.2.5	Investigative Derived Waste	10
5.0	LABORATORY TESTS	10
5.1	Soil Samples	11
5.2	Groundwater Samples	11
6.0	RESULTS AND DISCUSSION	12
6.1	Geophysical Survey	12
6.2	Subsurface Conditions	12
6.3	Screening Levels	13
6.3.1	Human Health	13
6.4	Soil Testing Results	15
6.4.1	Gasoline UST and Fuel Dispenser Area	15
6.4.2	Shop/Barn Area	16
6.5	Groundwater Testing Results	16
7.0	CONCLUSIONS AND RECOMMENDATIONS	18
7.1	Gasoline UST Area	18
7.2	Barn/Shop Area	19
7.3	Recommendations	19
8.0	LIMITATIONS AND SIGNATURES	21
9.0	GLOSSARY OF ABBREVIATIONS	22

TABLES

- 1 Summary of Soil Testing Results
- 2 Summary of Soil Testing Results: Volatile Organic Compounds (VOCs)
- 3 Summary of Soil Testing Results: Polynuclear Aromatic Hydrocarbons (PAHs)
- 4 Summary of Soil Testing Results: Metals
- 5 Summary of Groundwater Testing Results: TPH and VOCs
- 6 Summary of Groundwater Testing Results: PAHs
- 7 Summary of Groundwater Testing Results: Dissolved Metals

FIGURES

- 1 Location Map
- 2 Site and Surrounding Area Map
- 3 Sampling Locations
- 4 Gasoline TPH in Soil

APPENDICES

- A Geophysical Survey Report
- B Field Boring Logs and Temporary Well Point Sample Forms
- C Laboratory Reports and Chain-of-Custody Documentation: Soil and Groundwater Samples

1.0 SUMMARY OF FINDINGS

Phase II Environmental Site Assessment (ESA) activities at the 7.66-acre rural residential property located at 24716 SW Grand Ronde Road, Grand Ronde, Oregon. The investigation activities were conducted to evaluate for potential impacts to subsurface soil or groundwater at the location of a fuel dispenser and associated underground storage tank (UST) and within the shop portion of a nearby barn.

The field activities were conducted on July 28, 2022 and August 11, 2022 and included completion of a geophysical survey and installation of 12 soil borings for the collection of soil and groundwater samples. A summary of the findings relating to the Phase II ESA is presented below.

Geophysical Survey

A geophysical survey was conducted in the area surrounding the old gasoline dispenser for the purpose of searching for location, orientation, and depth of the UST associated with this feature. The geophysical survey identified a suspected 2,500-gallon capacity UST immediately north of the fuel dispenser. The top of the suspected UST was estimated to be buried approximately 2 feet below ground surface (bgs), with a diameter of approximately 7 feet and a length of approximately 12 feet.

Subsurface Conditions

Subsurface soils observed beneath the property during the push probe boring activities were primarily composed of silt and sandy silt to depths between 7.5 and 9 feet bgs, underlain by very stiff brittle silt (siltstone?) and silty sand with minor gravel (very hard drilling) to the maximum depth explored at 20 feet bgs.

Uppermost groundwater was encountered within soil at depths of approximately 17 to 17.5 feet bgs. Based on area topography and hydrologic features, it is inferred that uppermost groundwater flows generally in a westerly to southwesterly direction toward Agency Creek, located approximately 600 to 700 feet from the area of site investigation.

Field screening evidence of petroleum impacts to soil (e.g., discoloration and odor) were observed within a very thin (approximately 1 to 2-inch thick) zone at borings immediately north, east and southwest of the UST and fuel dispenser. The zone of apparent impact at all three locations was limited to 1 to 2 inches of soil present immediately above the sharp transition to very stiff/hard soils encountered between 7.5 to 8.5 feet bgs. The observed distribution of soils with field screening evidence of contamination suggests the stiff/hard soils acted to prevent vertical migration of contamination and

instead supported lateral migration in a thin zone above the hard soils in the immediate UST area.

Gasoline UST Area

A release of gasoline-range petroleum hydrocarbons from the UST system was confirmed as part of Phase II ESA activities. HAI reported the release to the Oregon Department of Environmental Quality (DEQ) on behalf of the property owner on August 22, 2022. DEQ issued Leaking Underground Storage Tank (LUST) File No. 36-22-0670 to the property.

The extent of contaminated soil beyond the limits of the UST area appears limited to a thin band of several inches thick that extends only a small lateral distance away from the UST or dispenser at a depth of between 7 and 8.5 feet bgs, depending on location.

Detected gasoline-range total petroleum hydrocarbon (TPH) concentrations in the thin band of soil immediately north, east, and southwest of the UST area exceed the DEQ Risk Based Concentrations (RBCs) established for *Residential Vapor Intrusion to Indoor Air*, with the highest detected concentration also exceeding the DEQ RBC established for *Residential Dermal Contact, Inhalation, and Ingestion*. Soil data collected from borings installed beyond the above-described areas of contamination show the lateral extent of contamination greater than DEQ RBCs is defined and appears limited to the immediate vicinity of the UST and fuel dispenser.

The area of soil contamination is approximately 90 feet away from the existing site residential structure, with most of the house structure greater than 100 feet away. Due to the depth, limited nature (a thin zone that is not laterally extensive), and distance from the structure, the contaminated soils do not appear to represent a vapor intrusion condition relative to the existing site structure. Further, the depth of the thin band of contaminated soil (7 to 8.5 feet bgs) does not represent a current complete exposure pathway to a residential receptor and therefore does not pose a current unacceptable human health risk at the site.

Groundwater quality data collected from inferred down-gradient locations (west and southwest) of the UST and fuel dispenser did not detect the presence of gasoline or gasoline-related contaminants that would suggest that releases from the UST have resulted in significant impacts to uppermost groundwater.

Barn / Shop Area

Diesel-range TPH and several polynuclear aromatic hydrocarbons (PAHs) were detected in the groundwater sample collected from the grease pit/sump

area at concentrations slightly greater than *Residential Tapwater Ingestion* RBCs but are well below all other potentially applicable RBCs. The source of the diesel-range TPH is not known, though may be related to historical uses of the adjacent grease pit/sump feature.

Testing of soil samples from the grease pit/sump area did not detect significant contamination, suggesting that the source for the diesel-range petroleum hydrocarbons and PAHs beneath the barn area is minor/limited in nature and extent.

Although the detected contaminant levels in groundwater at the grease pit/sump location slightly exceed *Residential Tapwater Ingestion* RBCs, that exposure pathway is not complete due to a lack of groundwater usage at, and immediately downgradient of, the site. Although the lateral extent of the groundwater contamination at the shop area has not been fully delineated, due to the low levels detected and the very low conductivity of the soils, impact to the uppermost groundwater is not expected to extend a significant distance beyond the limits of the barn structure.

Recommendations

Based on the findings of the subsurface investigation, the following recommendation is presented:

- Because a release has been documented to have occurred, it is recommended that the UST system be decommissioned by removal in accordance with Oregon Administrative Regulation (OAR) 340-150-0168. The UST decommissioning should include completion of a site assessment to evaluate soil quality beneath the UST and fuel dispenser, with removal and off-site disposal of contaminated soil as deemed necessary to achieve closure and receipt of a No Further Action designation from the DEQ for LUST File No. 36-22-0670.

2.0 INTRODUCTION

Confederated Tribes of the Grand Ronde retained Hahn and Associates, Inc. (HAI) to conduct Phase II Environmental Site Assessment (ESA) activities at the 7.66-acre rural residential property located at 24716 SW Grand Ronde Road, Grand Ronde, Oregon (Figures 1 and 2).

The investigation activities were conducted to evaluate for potential impacts to subsurface soil or groundwater at the location of a fuel dispenser and associated underground storage tank (UST) and within the shop portion of a nearby barn.

3.0 BACKGROUND

3.1 Subject Property Description

The 7.66-acre subject property consists of Tax Lot 1500 located in the SE 1/4 of the NW 1/4 of Section 1, Township 6 South, Range 8 West of the Willamette Meridian.

The subject property is developed at its eastern portion with a residence, a barn with a shop area, and several small sheds, as well as kitchen and herb gardens. The western portion of the property consists of a grassy field surrounded by dense vegetation. Agency Creek flows across the westernmost portion of the property (Figure 2).

The surrounding properties consist of undeveloped land, hay fields, and some residences.

3.2 Subject Property and Surrounding Property History

The subject property has been part of the Grand Ronde Reservation since its establishment in the 1850s. The subject property and nearby surrounding area were developed with a depression-era tribal cannery in the 1930s, which reportedly produced canned meat, fish, vegetables, and fruits. The tribal cannery continued to operate through the mid-1950s when federal recognition of the Grand Ronde tribes was terminated. After the cannery shut down, this building was converted for residential use.

In 1936, the subject property was developed with at least four buildings, including a rectangular building located immediately to the south of its northernmost perimeter, and three buildings at its eastern portion, including the former cannery building that was later converted into the existing residence, and two small buildings near or straddling the southern perimeter.

Reportedly, the existing Shop Building was also constructed in the 1930s and was used for vehicle maintenance during the era of the tribal cannery operations (1930s-1950s). The old fuel dispenser that remains on the property was also reported to have been installed in the 1930s and was reportedly used for fueling automobiles with gasoline.

By 1962, only the existing Residence in its current configuration and the existing Shop Building remained onsite, and since then usage of the subject property has consisted primarily of rural residential use. The Shop Building was used by Mr. Kenneth A. Larsen as part of his contracting and home remodeling businesses (1962 to 2022). The use of the gasoline dispenser for the fueling of vehicles was reportedly discontinued by at least the 1960s, at which time it is surmised that the associated UST would have been emptied and taken out of service.

With regard to surrounding properties, from the 1930s through the present, these areas have consisted primarily of agricultural fields (hay, grain, or pasturage) separated by wooded areas along drainages.

3.3 HAI Phase I Environmental Site Assessment (2022)

In July 2022, HAI conducted a Phase I ESA¹ of the subject property. The Phase I report identified two Recognized Environmental Conditions (RECs), as defined by American Society for Testing and Materials (ASTM) Practice E1527-13, in which additional investigation was recommended to document and further evaluate such condition:

1. A rusted, out-of-use fueling pump was present on the subject property, outside and to the north of the Barn / Shop Building. Reportedly, this pump was installed in the 1930s, and has not been used since at least the 1960s.

Recommendation: A geophysical survey should be conducted to identify any underground storage tank that may have been associated with this fueling pump. Further, a subsurface investigation should be performed at the property to determine whether soil and/or groundwater at the property have been impacted by historical releases from the fueling pump and any associated infrastructure.

2. The Shop Building on the subject property was reportedly used for vehicle maintenance and repair activities during the 1930s through the mid-1950s. More recently, it has been used as storage and shop space for a

¹ Hahn and Associates, Inc. (2022). *A Phase I Environmental Site Assessment, 7.6-Acre Rural Residential Property, 24716 SW Grand Ronde Road, Grand Ronde, Yamhill County, Oregon* (HAI Project 9852). July 8, 2022.

home building and remodeling business, and also for routine oil changes on personal vehicles.

Recommendation: A subsurface investigation should be performed at the Shop Building to determine whether soil and/or groundwater in this vicinity have been impacted by historical site operations.

In addition, while not Recognized Environmental Conditions under E1527-13, information and a recommendation regarding the following was also presented: 1) based on the age of the residence (built in 1930), materials used in its construction may contain asbestos; 2) numerous containers of building materials, automotive-related substances, and some home and gardening materials were present on the subject property; and 3) two out of use water supply wells were present on the subject property. The Phase I ESA recommended that an asbestos survey be performed for the residence; containers that will not be used should be removed from the property for recycling or proper disposal; and the water supply wells should be decommissioned in accordance with applicable regulations.

The investigation activities discussed in Section 4.0 were conducted to evaluate the two above-identified RECs – the potential for subsurface media at the property to have been impacted by a release from the UST/fuel dispenser or within the shop portion of the barn. This Phase II ESA did not address the “non-REC” items pertaining to the potential for asbestos in property building materials; the containers of building, automotive, or gardening materials, or the two out-of-use water supply wells.

4.0 FIELD ACTIVITIES

In July and August 2022, Phase II ESA field activities were conducted, overseen, and documented by HAI at the subject property, as described below.

4.1 Geophysical Survey

A geophysical survey was conducted in the area surrounding the old gasoline dispenser for the purpose of searching for location, orientation, and depth of the UST that would have been associated with this feature. The geophysical survey included the area of the shop, surrounding a grease pit/sump location in an effort to determine that nature of the plumbing for that feature. Lastly, the locations of possible future soil boring locations were cleared in the area surrounding the fuel dispenser and UST as well as in the area of the former shop.

The survey was conducted on July 28, 2022 by GeoPotential, Inc. Magnetic and ground penetrating radar (GPR) traverses, and hand-held magnetic and electromagnetic scanners were used for the project. The results of the geophysical survey are discussed in Section 6.1, and the geophysical survey report is included as Appendix A.

4.2 Subsurface Investigation

Subsurface investigation activities were conducted on August 11, 2022 and consisted of the advancement of 7 borings at the site for the collection of soil and groundwater samples.

The sampling locations were cleared for installation by identifying public and private underground utilities within the proposed investigation areas. Public utility notifications were performed, and an underground utility locating contractor performed borehole clearance activities (as part of the geophysical survey as described in Section 4.1).

Soil Boring Locations and Depths

A total of 12 soil borings (P-1 through P-12) were advanced at the site as shown on Figure 3. All of the borings with exception of P-4 were advanced in the area surrounding the gasoline dispenser and associated UST. Boring P-4 was installed immediately adjacent to the grease pit/sump located within the shop portion of the barn.

With regard to the borings installed in the UST/dispenser area, borings P-1, P-2, P-3, and P-5 were installed as close as feasible to these features, while borings P-6 and P-7 were installed in an effort to delineate the lateral extent of apparent soil impacts observed at the P-2 and P-5 boring locations.

Temporary well points were installed within boring P-1 and P-4 for collection of groundwater samples. These borings were selected for groundwater sample collection due to their estimated down-gradient location relative to the UST (P-1 and P-4) or the grease pit/sump in the barn/shop area (P-4).

4.2.1 Subsurface Drilling Procedures

HAI contracted with Holt Services, Inc., an Oregon-bonded and licensed Monitoring Well Constructor of Vancouver, Washington, to perform the drilling activities at the property. A track mounted Geoprobe® drilling rig was utilized to advance the direct push borings, installed to a depths of 10 to 20 feet bgs. A 2.25-inch outer-diameter (OD) sampling device and steel rods were hydraulically driven through the soils allowing for continuous collection of soil

cores. Groundwater samples were collected from 2 of the 12 boring locations during the August 2022 investigation.

Following completion of soil boring activities, the borings were backfilled with 3/8-inch bentonite chips to within 6 inches of the ground surface. Either topsoil or concrete was placed in the upper 6 inches of the borings to match the surrounding land surface.

The boring installations were completed in accordance with the Oregon Groundwater Law (Oregon Revised Statute (ORS) Chapter 537) and the Rules for Construction and Maintenance of Monitoring Wells and Other Holes in Oregon (Oregon Administrative Rules (OAR) Chapter 690, Division 240).

The field soil boring logs for the August 2022 investigation indicating the soil types encountered, field screening results, and potential zones of contamination encountered, are included in Appendix B.

4.2.2 Soil Sampling and Screening Procedures

Soil Sampling Procedures

An HAI geologist was present during HAI's subsurface investigation activities to observe and document drilling and sample collection procedures, obtain field samples, perform field screening activities, collect samples for laboratory analysis, and prepare lithologic logs for each boring.

Continuous soil cores were collected by advancing a 5-foot long, 1.5-inch inside diameter (ID) Macro-Core® sampler fitted with a disposable plastic liner. The full length of each soil core was observed for soil type and the potential presence of contamination (i.e., odor, discoloration, staining, sheen, etc.). Discrete soil samples were selected from the cores for possible laboratory analysis based on field observation of soil type and/or field screening evidence of potential impacts. The properties of each soil core were noted in the field by the HAI scientist (Appendix B).

Upon collection of the soil cores, samples retained for potential chemical analysis were placed immediately in glass sample jars and capped with teflon-lined lids. In addition, samples that were anticipated to potentially be tested for gasoline and/or volatile organic compounds (VOCs) were collected by U.S. Environmental Protection Agency (EPA) Field Method 5035 with methanol preservation. The sample containers were then labeled and transferred to a chilled thermally insulated container for shipment to the analytical laboratory. Standard sampling protocols, including the use of chain-of-custody documentation, were followed for all sampling procedures.

Field Screening Procedures

Upon retrieval, the soil cores were screened in the field for the presence of contamination by the visual, olfactory, headspace vapor, and sheen test methods. The presence of sheen was assessed by placing clean tap water in a black pan and introducing approximately 5 grams of disaggregated soil to the water. Screening for the presence of organic vapors was conducted by the headspace method using a photoionization detector (PID) equipped with a 10.6 ev lamp. The results of the headspace screening are recorded on the boring logs (Appendix B) in parts per million (ppm). The headspace measurement results are intended for use as a qualitative indicator of the possible presence of contamination and used for relative comparison purposes.

4.2.3 Groundwater Sampling Procedures

Groundwater samples were collected from boring locations P-1 and P-4 (Figure 3). An attempt to collect a groundwater sample from the boring P-5 location was made, but the temporary well point remained dry.

To collect the groundwater samples, temporary well points were constructed using a 10-foot length of new disposable 2-inch ID, 0.010-inch slotted polyvinyl chloride (PVC) well screen that was placed below the first encountered groundwater level. The screen interval for P-1 was established as 10 to 20 feet bgs, while the screen interval for P-4 was established as 9 to 19 feet bgs. Initial water was measured at P-1 at a depth of 18 feet bgs but rose to a depth of 8 feet bgs prior to sampling approximately 3 hours later. Depth to water was measured at 15 feet bgs at the P-4 location, which did not change prior to sample collection. A temporary well point was installed from 3 to 13 feet bgs at boring P-5 due to the indication of a small zone of saturation at 12 feet bgs, but measurable water did not enter the well point over the course of several hours.

The groundwater sample from borings P-1 and P-4 were collected from the temporary well point with new polyethylene tubing following purging of water from each location with a peristaltic pump. The temporary well point at P-1 produced a sufficient volume of water to allow the turbidity to decline (approximately 10 liters were purged). The temporary well point at P-4 purged to dryness and recharged very slowly. As such, the turbidity of the water at P-4 could not be significantly reduced over the course of pumping. Instead, sample containers were filled at this location in stages as water slowly entered the well point.

Sample containers were completely filled such that no headspace was present that would allow for the loss of volatiles. The sample containers were

then labeled and transferred to a chilled thermally-insulated container for shipment to the analytical laboratory. Temporary well point groundwater sampling forms are included in Appendix B.

4.2.4 Decontamination Procedures

To minimize the potential for cross-contamination between sampling locations all down-hole drilling and soil sampling equipment was thoroughly cleaned prior to initiating work. All reusable drilling equipment (i.e. casing, barrel samplers) was steam cleaned with hot potable water prior to use, and between boring locations. New disposable tubing was used for the collection of each groundwater sample. A new pair of disposable nitrile gloves was used for the collection of each soil and groundwater sample.

4.2.5 Investigative Derived Waste

Investigation derived waste (IDW) generated during the work activities included excess soil cuttings not retained for laboratory chemical analysis, decontamination rinsate water, purge water, disposable tubing from the groundwater sample locations, and personnel protective equipment (e.g., gloves). Although evidence of contamination was observed during the field screening, soils with such evidence was limited to thin zones that were retained for laboratory testing. Because excess soil sampling waste did not exhibit field screening evidence of contamination, soil sample waste, rinsate and temporary well point purge water was placed in an unpaved area on the subject property. Tubing and personnel protective equipment was disposed of as non-hazardous solid waste.

5.0 LABORATORY TESTS

The soil and groundwater samples collected during the August 11, 2022 investigation were shipped under chain-of-custody documentation in chilled, thermally insulated coolers to the Pace Analytical Services, LLC, an Oregon-accredited laboratory in Mt. Juliet, Tennessee.

The soil testing results are summarized on Tables 1 through 4 and are discussed in Section 6.4. The groundwater testing results are summarized on Tables 5 through 7 and are discussed in Section 6.5.

The specific tests conducted on the soil and groundwater samples as part of the August 2022 investigation are summarized below.

5.1 Soil Samples

A total of 20 discrete soil samples were collected from the 7 borings installed during the August 2022 investigation. Of these, 13 soil samples were selected for laboratory testing, described as follows:

- 13 samples were tested for diesel- and oil-range TPH by Northwest (NW) Method TPH-Dx;
- 12 samples were tested for gasoline-range TPH by NW Method TPH-Gx;
- 4 soil samples were tested for polynuclear aromatic hydrocarbons (PAHs) by U.S. Environmental Protection Agency (EPA) Method 8270E SIM;
- 2 soil samples were tested for volatile organic compounds (VOCs) by EPA Method 8260D;
- 1 soil sample was tested for Resource Conservation and Recovery Act (RCRA) metals testing on a total basis by EPA Method 6020B/7470A.

The laboratory reports and chain-of-custody documentation for soil sampling activities are included in Appendix C.

5.2 Groundwater Samples

Two groundwater samples were collected during the August 2022 investigation. The two groundwater samples were collected from the inferred down-gradient location relative to the UST, with one of the samples also corresponding to the location of the grease pit/sump feature within the shop area floor.

Both groundwater samples were analyzed for gasoline-, diesel, and oil-range total petroleum hydrocarbons by NW Methods TPH-Gx and TPH-Dx, for PAHs by EPA Method 8270E SIM, and for VOCs by EPA Method 8260D. Additionally, the groundwater sample collected in the UST vicinity was selected for dissolved metals testing by EPA Method 6020B/7470A. There was insufficient recharge from the temporary well point installed in the shop area for the collection of the sample volume needed for dissolved metals testing at that location.

The laboratory reports and chain-of-custody documentation for groundwater sampling activities are included in Appendix C.

6.0 RESULTS AND DISCUSSION

6.1 Geophysical Survey

The results of the geophysical survey identified a suspected UST at a location immediately north of the fuel dispenser. The top of the suspected UST was estimated to be buried approximately 2 feet bgs, with a diameter of approximately 7 feet and a length of approximately 12 feet. The estimated location of the UST is shown on Figures 2 and 3. As estimated by the geophysical subcontractor, the UST may have an approximate capacity of 2,500 gallons. A suspected buried electrical conduit was identified during the geophysical survey, extending from the nearby barn structure to the location of the fuel dispenser.

With regard to the shop portion of the barn structure, an apparent overflow drain line was noted as extending from the grease pit/sump in the floor southward an undetermined distance beyond the limits of the barn structure.

All suspected features were marked on the property with white paint at the time of the survey, and are shown on a site map included within the geophysical report, included within Appendix A.

6.2 Subsurface Conditions

According to the Oregon Department of Geology and Mineral Industries *Geologic Map of the Grand Ronde Quadrangle, Polk and Yamhill Counties, Oregon*, 1982, the subsurface soils in the vicinity of the subject property are underlain by Holocene-age alluvium that is characterized as mostly poorly sorted, unconsolidated deposits of clay, silt, sand, and fine to very coarse gravel and includes recent alluvial terrace deposits associated with the South Yamhill River and its tributaries. The alluvium is described as being up to 50 feet in thickness, and is underlain by the Eocene Yamhill Formation, a tuffaceous shale and siltstone with occasional sandstone beds.

Subsurface soils observed beneath the property during the push probe boring activities were primarily composed of silt and sandy silt to depths between 7.5 and 9 feet bgs, underlain by very stiff brittle silt (siltstone?) and silty sand with minor gravel to the maximum depth explored at 20 feet bgs.

Uppermost groundwater was encountered within soil at depths of approximately 17 to 17.5 feet bgs, with water levels measured in temporary well points as shallow as 8 feet bgs in boring P-1 after a period of stabilization and 15 feet at P-4 after a period of stabilization. A thin (several inches) zone of water saturated soils was observed at the P-5 location at a depth of 12 feet

bgs, but no water entered a temporary well point installed across that depth interval.

Based on area topography and hydrologic features, it is inferred that uppermost groundwater flows generally in a westerly to southwesterly direction toward Agency Creek, located approximately 600 to 700 feet from the area of site investigation.

Soil Field Screening

Evidence of petroleum impacts to soil were observed within a very thin (approximately 1 to 2-inch thick) zone at borings P-2, P-3, P-5, and P-7. The zone of apparent petroleum impact was present at 8.5 feet bgs at P-2 and at 7.5 feet bgs at borings P-3, P-5, and P-7. The zone of impact at P2 and P-5 showed a blue-grey discoloration, petroleum odor, and elevated organic headspace (greater than 140 ppm at both locations). The zone of apparent impact at P-3 and P-7 did not show discoloration and the odor was significantly less pronounced, and with a lesser organic headspace (23.4 ppm at P-3 and 7.2 ppm at P-7). The zone of apparent impact at all three locations was limited to 1 to 2 inches of soil present immediately above the sharp transition to very stiff/hard soils. The observed distribution of soils with field screening potential of impact suggests the stiff/hard soils acted to prevent vertical migration of contamination and instead supported lateral migration along that surface in the immediate UST area.

No evidence of petroleum contaminated soil was observed at the P-1 or P-6 locations in the UST area, or at the P-4 location in the shop/barn area.

6.3 Screening Levels

To provide a framework for evaluating the significance of findings, laboratory testing results were compared to various established screening level values. The screening levels discussed below are listed on Tables 1 through 7 for comparison purposes.

Exceeding one of the screening levels does not necessarily mean that cleanup is required but would suggest that additional evaluation or investigation may be necessary to determine the need for remedial action.

6.3.1 Human Health

Risk-Based Concentrations (RBCs)

With respect to human health, soil and groundwater testing results were

compared to DEQ RBCs², where established. The property has rural residential usage with incidental harvesting of grass hay, while surrounding properties have a similar rural residential and low-intensity agricultural usage.

Soil RBCs

The property usage equates to a *Residential* receptor scenario in the DEQ's Risk-Based Decision Making (RBDM) guidance (DEQ 2003). Therefore, DEQ RBCs as established for the *Residential* receptor scenarios are used to screen site data. The *Construction Worker* and *Excavation Worker* receptor scenarios are not dependent on land use but are included since they would be applicable to any future construction activities on the subject property.

Groundwater RBCs

Due to the availability and usage of municipal water at the property and the adjacent down-gradient property, it is concluded that uppermost groundwater in the vicinity of the site is not used, nor anticipated to be used, in the future for consumptive or irrigation purposes. Interviews with the owner of the subject property (Pamela Larsen) as well as the owner of the property to the south (Confederated Tribes of the Grand Ronde) confirms this finding. As such, the *Leaching to Groundwater* (for soil) exposure and *Tap Water Ingestion* (from groundwater) exposure pathways are not complete in the area of the subject property and therefore RBCs based on those pathways are not considered applicable. Although not directly applicable with regard to potential human health risk, RBCs as established for *Residential Tap Water* are included on Tables 1 through 7 for descriptive purposes.

Due to the shallow nature of groundwater (seasonally shallower than 12 feet bgs), the potential for contact with groundwater during future construction or trenching activities does exist. As such, all groundwater data are screened against the *Groundwater in Excavation RBCs (Construction and Excavation Worker)* as included on Tables 5 through 7.

Background Concentrations for Metals

For metals in soil (Table 4), the testing results were also compared to DEQ *Regional Default Background Concentrations for Metals in Soil* for the Southern Willamette Valley region³.

² Oregon Department of Environmental Quality (2003, 2018). *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*. September 22, 2003, RBCs updated May 2018.

³ Oregon Department of Environmental Quality (2013). Fact Sheet: *Background Levels of Metals in Soils for Cleanup*. March 20, 2013.

6.4 Soil Testing Results

Results of the testing of soil samples collected from push probe borings during the August 11, 2022 investigation are described within this section. Soil data are summarized on Tables 1 through 4. Gasoline-range TPH results are posted on Figure 4.

6.4.1 Gasoline UST and Fuel Dispenser Area

As described in Section 6.2, field screening of soils from borings installed immediately adjacent to the north, east, and southwest of the UST and the associated fuel dispenser identified a thin (several inches thick) zone of contamination (odor, elevated headspace, discoloration) within a depth interval of approximately 7.0 to 8.5 feet bgs, depending on location. This thin zone of contamination was in all cases observed to be present immediately above the contact between silty soils and underlying very hard/brittle silt and sandy silt with gravel. The thin zone of contamination, as observed through field screening, was confirmed and characterized through laboratory testing, as described below.

Gasoline-Range TPH: As summarized on Table 1 and shown on Figure 4, gasoline-range TPH was detected in soil samples collected adjacent to the UST and fuel dispenser, with 94.2 milligrams per kilogram (mg/kg) detected immediately east of the UST (7 feet bgs at boring P-3); 413 mg/kg detected immediately north of the UST (8.5 feet bgs at boring P-2) and 1,660 mg/kg detected immediately southwest of the fuel dispenser (7 feet bgs at boring P-5). These detected concentrations exceed the 94 mg/kg DEQ RBC as established for *Residential Vapor Intrusion to Indoor Air*, while the highest concentration detected at P-5 also exceeds the DEQ RBC established for *Residential Direct Contact*. Testing of soil samples collected from borings P-1, P-6, and P-7 (Table 1, Figure 4) show that the lateral extent of the thin zone of soil contamination is limited to the immediate vicinity of the UST/fuel dispenser. Soil samples collected immediately above and below the thin zone of contamination at boring P-5 (the worst-case location) confirms that the zone of gasoline contamination (greater than DEQ RBCs) is limited to the thin (2-inch thick) zone immediately above the very hard/brittle soil encountered at these locations.

Diesel- and Oil-Range TPH: As summarized on Table 1, only low levels of diesel- or oil-range TPH (in all cases less than 90 mg/kg) were detected in soil samples collected surrounding the UST and associated dispenser. The detected diesel- or oil-range TPH concentrations are well below any potentially applicable DEQ RBC.

VOCs and PAHs: The two soil samples with the highest detections of gasoline-range TPH (8.5 feet bgs at P-2 and 7 feet bgs at boring P-5) were tested for VOCs and PAHs. Only trace to low levels of VOCs or PAHs were detected these locations. With exception of the *Leaching to Groundwater* pathway, only ethylbenzene from the thin zone of contamination at P-5 exceeded a DEQ RBC, with 1.41 mg/kg ethylbenzene detected, slightly greater than the 1.3 mg/kg RBC established for the *Residential Vapor Intrusion to Indoor Air*. Several other VOCs or PAHs slightly exceeded RBCs established for *Leaching to Residential Tapwater*, though this is not a current risk pathway at the site or immediate vicinity due to lack of groundwater use.

Metals: The soil sample with the highest detection of gasoline-range TPH (7 feet bgs at boring P-5) was tested for RCRA metals. As summarized on Table 4, all metals were detected at concentrations deemed typical of naturally occurring background levels for the region and do not suggest metals to be contaminants of concern with regard to the UST release.

6.4.2 Shop/Barn Area

Soil samples were collected from 5, 8, and 12 feet bgs at boring P-4, installed immediately adjacent to the small grease pit/ sump located within the shop portion of the barn. The small grease pit is several feet wide and 2.7 feet deep, with a 6-inch diameter overflow pipe 1.2 feet above the base of the pit and extending southward. Soil samples were collected at this location in an effort to ascertain whether soils in this area may have been impacted as a result of unknown practices associated with the grease pit and former automobile repair activities in this area.

The two shallower soil samples (5 and 8 feet bgs) were tested for gasoline-range TPH while all three soil samples (5, 8, and 12 feet bgs) were tested for diesel- and oil-range TPH (Table 1). Gasoline-range TPH was not detected in any soil sample and only low levels of diesel-range TPH (27.9 mg/kg) and oil-range TPH (33.5 mg/kg) were detected in the deepest analyzed sample (12 feet bgs) at this location. The detected diesel- and oil-range TPH concentrations are well below any potentially applicable DEQ RBCs. Testing of the soil samples collected at 5 feet bgs and 12 feet bgs for PAHs detected only trace levels in the deeper soil sample - with all detections well below any potentially applicable DEQ RBCs.

6.5 Groundwater Testing Results

Results of the testing of groundwater samples collected from the August 11, 2022 investigation are described within this section. Groundwater data are summarized on Tables 5 through 7.

Based on site topography and local hydrologic features, it is estimated that groundwater flow direction beneath the UST and barn/shop portion of the property is to the west or southwest. Groundwater samples were collected from temporary well points installed in borings P-1 and P-4 during the August investigation. Boring P-1 was located immediately west of the UST area, while P-4 was installed to the southwest of the UST area, coinciding with the western side of the shop area grease pit / sump feature (Figure 3). As sited, it is inferred that the temporary well points were suitably positioned to evaluate groundwater quality at hydraulically down-gradient locations relative to site features of interest (UST / fuel dispenser and the grease pit in the shop area).

Gasoline-Range TPH: No detectable concentrations of gasoline-range TPH were detected in groundwater samples collected from either temporary well point location.

Diesel- and Oil-Range TPH: A concentration of 450 micrograms per liter ($\mu\text{g/L}$) of diesel-range TPH was detected in the groundwater sample collected from the shop/grease pit area (P-4), while no detectable concentrations of diesel-range TPH were detected immediately west of the UST (P-1). The detected diesel-range TPH concentration ($450 \mu\text{g/L}$) is slightly greater than the $100 \mu\text{g/L}$ *Residential Tapwater Ingestion* RBC but is well below all other potentially applicable RBCs (Table 5). The *Residential Tapwater Ingestion* RBC is not relevant as a current risk pathway at the site or immediate vicinity due to lack of groundwater use.

No detectable concentrations of oil-range TPH were detected at either temporary well point location.

VOCs: VOCs were not detected at concentrations greater than laboratory method reporting limits (MRLs) in the groundwater samples collected from the P-1 or P-4 boring locations (Table 5).

PAHs: Several individual PAH constituents were detected in groundwater samples from the P-4 location, with only benzo(a)anthracene and benzo(a)pyrene detected at concentrations slightly above the DEQ RBC for *Residential Tap Water Ingestion* (Table 6). The *Residential Tapwater Ingestion* RBC is not relevant as a current risk pathway at the site or immediate vicinity due to lack of groundwater use. PAHs were not detected at concentrations greater than laboratory MRLs in the groundwater sample collected from the P-1 boring location.

Dissolved Metals: Only one dissolved metal (barium) was detected in the groundwater sample collected from boring P-1, immediately west of the UST

(Table 7). The detected concentration (65 µg/L) is well below any potentially applicable RBC for this metal. Metals were not tested at the P-4 location due to the limited sample volume available at that location resulting from the very slow recharge rate at that location subsequent to purging that well point to dryness.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Laboratory testing of soil samples indicate that gasoline-range petroleum hydrocarbon contamination is present in the area of the out-of-service gasoline UST and associated dispenser and that low levels of diesel- and oil-range petroleum hydrocarbons are present at depth beneath the shop portion of the barn. Findings and recommendations from the Phase II ESA are summarized below.

7.1 Gasoline UST Area

A release of gasoline-range petroleum hydrocarbons from the UST system has been confirmed as part of Phase II ESA activities. Because the detected petroleum contamination is from a UST system, this would be considered by the Oregon DEQ to be a reportable release in accordance with OAR 340-122-0220. HAI reported the release to the DEQ on behalf of the owner on August 22, 2022. DEQ issued Leaking Underground Storage Tank (LUST) File No. 36-22-0670 to the property, with a site name of "Larsen Property".

Geophysical survey activities have estimated that the UST at the property is located immediately north of the fuel dispenser and has estimated diameter of 7 feet and a length of 12 feet. The top of the tank was estimated to be buried approximately 2 feet bgs, with the base of the tank estimated to be at 9 feet bgs. The geophysical contractor estimates that the UST has a capacity of approximately 2,500 gallons.

Detected gasoline-range TPH concentrations in the thin band of soil immediately north, east, and southwest of the UST area exceed the DEQ RBC established for *Residential Vapor Intrusion to Indoor Air*, with the highest detected concentration also exceeding the DEQ RBC established for *Residential Dermal Contact, Inhalation, and Ingestion*. Soil data collected from borings installed beyond the above-described areas of contamination show the lateral extent of contamination greater than DEQ RBCs is defined and appears limited to the immediate vicinity of the UST and fuel dispenser.

The area of soil contamination is approximately 90 feet away from the existing site residential structure, with most of the house structure greater than 100 feet away. Due to the depth, limited nature (a thin zone that is not

laterally extensive), and distance from the structure, the contaminated soils do not appear to represent a vapor intrusion condition relative to the existing site structure. Further, the depth of the thin band of contaminated soil (7 to 8.5 feet bgs) does not represent a current complete exposure pathway to a residential receptor and therefore does not pose a current unacceptable human health risk at the site.

Groundwater quality data collected from inferred down-gradient locations (west and southwest) of the UST and fuel dispenser did not detect the presence of gasoline or gasoline-related contaminants that would suggest that releases from the UST have resulted in significant impacts to uppermost groundwater.

7.2 Barn/Shop Area

Diesel-range TPH and several PAHs were detected in the groundwater sample collected from the grease pit/sump area (P-4) at concentrations slightly greater than *Residential Tapwater Ingestion* RBCs but are well below all other potentially applicable RBCs. The source of the diesel-range TPH is not known, though may be related to historical uses of the adjacent grease pit/sump feature.

Testing of soil samples from the grease pit/sump area did not detect significant contamination, suggesting that the source for the diesel-range petroleum hydrocarbons and related contaminants beneath the barn area is minor/limited in nature and extent.

Although the detected contaminant levels in groundwater slightly exceed the *Residential Tapwater Ingestion* RBC, that exposure pathway is not complete/relevant due to a lack of groundwater usage at, or immediately downgradient of, the site. Although the lateral extent of the groundwater contamination at the P-4 location has not been fully delineated, due to the low levels detected and the very low conductivity of the soils (well point purged dry), impact to the uppermost groundwater is not expected to extend a significant distance beyond the limits of the barn structure.

7.3 Recommendations

Based on the findings from the subsurface investigation, the following recommendation is presented:

UST Decommissioning: Because a release has been documented to have occurred, it is recommended that the UST system be decommissioned by removal in accordance with OAR 340-150-0168. The UST decommissioning should include completion of a site assessment to evaluate soil quality

beneath the UST and fuel dispenser, with removal and off-site disposal of contaminated soil as deemed necessary to achieve closure and receipt of a No Further Action designation for LUST File No. 36-22-0670.

8.0 LIMITATIONS AND SIGNATURES

The information presented in this report was collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This report and the conclusions and/or recommendations contained in it are based solely upon research and/or observations, and physical sampling and analytical activities that were conducted.

The information presented in this report is based only upon activities witnessed by HAI or its contractors, and/or upon information provided to HAI by the Client and/or its contractors. The analytical data presented in this report document only the concentrations of the target analytes in the particular sample, and not the property as a whole.

Unless otherwise specified in writing, this report has been prepared solely for the use by the Client and for use only in connection with the evaluation of the subject property. Any other use by the Client or any use by any other person shall be at the user's sole risk, and HAI shall have neither liability nor responsibility with respect to such use.

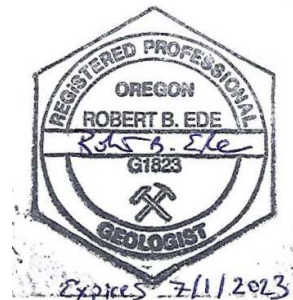
Hahn and Associates, Inc.

Prepared by:

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Principal

Date: September 23, 2022



9.0 GLOSSARY OF ABBREVIATIONS

ASTM	American Society for Testing and Materials
bgs	below ground surface
DEQ	Oregon Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
GPR	ground penetrating radar
HAI	Hahn and Associates, Inc.
ID	inside diameter
IDW	investigation derived waste
LUST	leaking underground storage tank
mg/kg	milligrams per kilogram
MRL	method reporting limit
NW	Northwest
OAR	Oregon Administrative Rules
OD	outside diameter
ORS	Oregon Revised Statute
PAHs	polynuclear aromatic hydrocarbons
PID	photoionization detector
PVC	polyvinyl chloride
ppm	parts per million
RBC	DEQ Risk Based Concentration
RBDM	Risk Based Decision Making
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
R.G.	Registered Geologist
SIM	single ion monitoring
TPH	total petroleum hydrocarbons
µg/L	micrograms per Liter
UST	underground storage tank
VOCs	volatile organic compounds

TABLES

TABLE 1 – Summary of Soil Testing Results

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

Risk-Screening Levels in mg/kg (ppm) ¹	Petroleum Hydrocarbons		
	Gasoline-Range	Diesel-Range	Oil-Range
RBC for Vapor Intrusion (Residential) ==>	94.	>Max	>Max ²
RBC for Direct Contact (Residential) ==>	1,200.	1,100.	36,000. ²
RBC for Leaching to Groundwater (Residential) ==>	31.	9,500.	>MAX
RBC for Direct Contact (Construction Worker) ==>	9,700.	4,600.	2,800. ²
RBC for Direct Contact (Excavation Worker) ==>	>Max	>Max	>Max ²

Laboratory Testing Results in mg/kg (ppm)

Location	Sample Number	Sample Date	Sample Depth (feet bgs)	NWTPH-Gx	NWTPH-Dx		EPA 8260D	EPA 8270E	EPA 6020B
				Gasoline-Range	Diesel-Range	Oil-Range	VOCs	PAHs	Metals
Underground Storage Tank Area									
P-1	9862-220811-01	11-Aug-22	9.0 - 9.5	11.8	11.9	14.3	NT	NT	NT
P-2	9862-220811-06	11-Aug-22	8.5 - 9.0	413.	9.96	12.9 U	Table 2	Table 3	NT
	9862-220811-07	11-Aug-22	11.0 - 11.5	36.5	30.5	32.	NT	NT	NT
P-3	9862-220811-09	11-Aug-22	7.0 - 7.5	94.2	4.8 U	12. U	NT	NT	NT
	9862-220811-10	11-Aug-22	9.5 - 10.0	9.47 B	18.8	23.	NT	NT	NT
P-5	9862-220811-15	11-Aug-22	6.0 - 6.5	4.03 U	4.95 U	18.3	NT	NT	NT
	9862-220811-16	11-Aug-22	7.0 - 7.5	1,660.	18.	16.7	Table 2	Table 3	Table 4
	9862-220811-17	11-Aug-22	10.5 - 11.0	9.23 B	33.9	38.5	NT	NT	NT
P-6	9862-220811-19	11-Aug-22	7.5 - 8.0	10.2 B	70.6	81.5	NT	NT	NT
P-7	9862-220811-20	11-Aug-22	7.5 - 8.0	84.8	6.11	12. U	NT	NT	NT
Barn/Shop Area									
P-4	9862-220811-12	11-Aug-22	5.0 - 5.5	3.99 U	5.09 U	12.7 U	NT	Table 3	NT
	9862-220811-13	11-Aug-22	8.0 - 8.5	4.26 U	5.05 U	12.6 U	NT	NT	NT
	9862-220811-14	11-Aug-22	12.0 - 12.5	NT	27.9	33.5	NT	Table 3	NT

bgs = below ground surface

DEQ = Oregon Department of Environmental Quality

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams/kilogram

1 = DEQ Risk-Based Concentration (RBC), May 2018, for indicated pathway

2 = DEQ RBC for Mineral Oil

ppm = parts per million

NT = not tested

PAHs = polynuclear aromatic hydrocarbons

TPH = total petroleum hydrocarbons

U = not detected above concentration indicated

VOCs = volatile organic compounds

>Max = RBC is greater than 1,000,000 mg/kg

B = Analyte was detected in associated blank

Bold = Detected concentration exceeds DEQ RBC for Leaching to Residential Groundwater Pathway

Bold, Red Text = Detected concentration exceeds DEQ RBC for Residential Vapor Intrusion Pathway

Yellow Highlight = Detected concentration exceeds DEQ RBC for Residential Direct Contact Pathway

Orange Highlight = Detected concentration exceeds DEQ RBC for Construction or Excavation Worker

TABLE 2– Summary of Soil Testing Results: Volatile Organic Compounds (VOCs)

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

Sample Area ==>	UST Area	
Sample Location ==>	P-2	P-5
Sample Number ==>	9862-220811-06	9862-220811-16
Sample Date ==>	11-Aug-22	11-Aug-22
Sample Depth ==>	8.5 - 9.0	7.0 - 7.5

Analytes	Risk-Screening Levels in mg/kg (ppm) ¹					Analytical Testing Results	
	Leaching to Groundwater (Residential)	Vapor Intrusion (Residential)	Direct Contact (Residential)	Direct Contact (Construction Worker)	Direct Contact (Excavation Worker)		
VOCs by EPA Method 8260D							
Acetone	ne	ne	ne	ne	ne	0.0791 UJ	1.42 U
Acrylonitrile	0.0004	0.079	0.86	40.	1,100.	0.0198 U	0.356 U
Benzene	0.023	0.16	8.2	380.	11,000.	0.00158 U	0.0307
Bromobenzene	ne	ne	ne	ne	ne	0.0198 U	0.356 U
Bromodichloromethane	0.002	0.041	3.4	230.	6,300.	0.00396 U	0.0712 U
Bromoform	0.046	8.2	57.	2,700.	74,000.	0.0396 U	0.712 U
Bromomethane	0.083	1.3	46.	370.	10,000.	0.0198 U	0.356 U
N-Butylbenzene	ne	ne	ne	ne	ne	0.0198 U	1.07
Sec-Butylbenzene	ne	ne	ne	ne	ne	0.0198 U	0.723
Tert-Butylbenzene	ne	ne	ne	ne	ne	0.00791 UJ	0.142 U
Carbon Tetrachloride	0.013	0.12	7.5	320.	8,900.	0.00791 U	0.142 U
Chlorobenzene	5.8	77.	530.	4,700.	130,000.	0.00396 U	0.0712 U
Chlorodibromomethane	0.0024	0.22	3.7	210.	5,800.	0.00396 U	0.0712 U
Chloroethane	310.	>Csat	160,000.	>Max	>Max	0.00791 U	0.142 U
Chloroform	0.0034	0.031	5.8	410.	11,000.	0.00396 U	0.0712 U
Chloromethane	2.2	24.	1,400.	25,000.	700,000.	0.0198 U	0.356 U
2-Chlorotoluene	ne	ne	ne	ne	ne	0.00396 U	0.0712 U
4-Chlorotoluene	ne	ne	ne	ne	ne	0.00791 U	0.142 U
1,2-Dibromo-3-Chloropropane	ne	ne	ne	ne	ne	0.0396 U	0.712 U
1,2-Dibromoethane (EDB)	0.0001	0.012	0.16	9.	250.	0.00396 U	0.0712 U
Dibromomethane	ne	ne	ne	ne	ne	0.00791 U	0.142 U
1,2-Dichlorobenzene	36.	>Csat	2,200.	20,000.	560,000.	0.00791 U	0.142 U
1,3-Dichlorobenzene	ne	ne	ne	ne	ne	0.00791 U	0.142 U
1,4-Dichlorobenzene	0.057	0.99	14.	1,300.	36,000.	0.00791 U	0.142 U
Dichlorodifluoromethane	ne	ne	ne	ne	ne	0.00396 U	0.0712 U
1,1-Dichloroethane	0.044	0.45	58.	3,200.	89,000.	0.00396 U	0.0712 U
1,2-Dichloroethane (EDC)	0.0028	0.077	3.6	200.	5,600.	0.00396 U	0.0712 U
1,1-Dichloroethene	6.7	54.	1,800.	13,000.	370,000.	0.00396 U	0.0712 U
Cis-1,2-Dichloroethene	0.63	>Max	160.	710.	20,000.	0.00396 U	0.0712 U
Trans-1,2-Dichloroethene	7.	>Max	1,600.	7,100.	200,000.	0.00791 U	0.142 U
1,2-Dichloropropane	ne	ne	ne	ne	ne	0.00791 U	0.142 U
1,1-Dichloropropene	ne	ne	ne	ne	ne	0.00396 U	0.0712 U
1,3-Dichloropropane	ne	ne	ne	ne	ne	0.00791 U	0.142 U
Cis-1,3-Dichloropropene	ne	ne	ne	ne	ne	0.00396 U	0.0712 U
Trans-1,3-Dichloropropene	ne	ne	ne	ne	ne	0.00791 U	0.142 U
2,2-Dichloropropane	ne	ne	ne	ne	ne	0.00396 U	0.0712 U
Di-Isopropyl Ether	ne	ne	ne	ne	ne	0.00158 U	0.0285 U
Ethylbenzene	0.22	1.3	34.	1,700.	49,000.	0.00799	1.41
Hexachloro-1,3-Butadiene	ne	ne	ne	ne	ne	0.0396 U	0.712 U
Isopropylbenzene	96.	>Csta	3,500.	27,000.	750,000.	0.00396 U	1.12
P-Isopropyltoluene	ne	ne	ne	ne	ne	0.019	2.72
2-Butanone (MEK)	ne	ne	ne	ne	ne	0.158 U	2.85 U
Methylene Chloride	0.14	26.	76.	2,100.	58,000.	0.0396 U	0.712 U
4-Methyl-2-Pentanone (MIBK)	ne	ne	ne	ne	ne	0.0777	0.712 U
Methyl Tert-Butyl Ether (MTBE)	0.11	8.5	250.	12,000.	320,000.	0.00158 U	0.0285 U
Naphthalene	0.077	6.4	5.3	580.	16,000.	0.0207 J	1.18
N-Propylbenzene	ne	ne	ne	ne	ne	0.00791 U	2.06
Styrene	170.	>Csat	7,900.	56,000.	>Max	0.0198 U	0.356 U
1,1,1,2-Tetrachloroethane	ne	ne	ne	ne	ne	0.00396 U	0.0712 U
1,1,2,2-Tetrachloroethane	ne	ne	ne	ne	ne	0.00396 U	0.0712 U
1,1,2-Trichlorotrifluoroethane	>Csat	>Csat	400,000.	>Max	>Max	0.00396 U	0.0712 U
Tetrachloroethene	0.46	2.8	220.	1,800.	50,000.	0.00396 U	0.0712 U
Toluene	84.	>Csat	5,800.	28,000.	770,000.	0.0128	0.142 U
1,2,3-Trichlorobenzene	ne	ne	ne	ne	ne	0.0198 UJ	0.356 U
1,2,4-Trichlorobenzene	ne	ne	ne	ne	ne	0.0198 UJ	0.356 U
1,1,1-Trichloroethane	190.	>Csat	53,000.	470,000.	>Max	0.00396 U	0.0712 U
1,1,2-Trichloroethane	0.0063	0.32	3.2	54.	1,500.	0.0237	0.0712 U
Trichloroethene	0.013	0.12	6.7	470.	13,000.	0.00158 U	0.0285 U
Trichlorofluoromethane	61.	190.	7,600.	69,000.	>Max	0.00396 U	0.0712 U

TABLE 2– Summary of Soil Testing Results: Volatile Organic Compounds (VOCs)

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

Sample Area ==>						UST Area	
Sample Location ==>						P-2	P-5
Sample Number ==>						9862-220811-06	9862-220811-16
Sample Date ==>						11-Aug-22	11-Aug-22
Sample Depth ==>						8.5 - 9.0	7.0 - 7.5
Analytes	Risk-Screening Levels in mg/kg (ppm) ¹					Analytical Testing Results mg/kg (ppm)	
	Leaching to Groundwater (Residential)	Vapor Intrusion (Residential)	Direct Contact (Residential)	Direct Contact (Construction Worker)	Direct Contact (Excavation Worker)		
1,2,3-Trichloropropane	ne	ne	ne	ne	ne	0.0198 U	0.356 U
1,2,4-Trimethylbenzene	10.	140.	430.	2,900.	81,000.	0.0256	1.53
1,2,3-Trimethylbenzene	ne	ne	ne	ne	ne	0.00791 U	0.276
1,3,5-Trimethylbenzene	11.	98.	430.	2,900.	81,000.	0.0117	6.05
Vinyl Chloride	0.0006	0.043	0.36	34.	950.	0.00396 U	0.0712 U
Xylenes, Total	23.	160.	1,400.	20,000.	560,000.	0.034	0.465

1 = DEQ Risk-Based Concentration (RBC), May 2018, for indicated pathway

bgs = below ground surface

DEQ = Oregon Department of Environmental Quality

EPA = U.S. Environmental Protection Agency

J= estimated concentrations

mg/kg = milligrams/kilogram

ne = screening level not established

ppm = parts per million

U = not detected above concentration indicated

VOCs = volatile organic compounds

>Csat = This soil RBC exceeds the limit of three phase partitioning

>Max = RBC is greater than 1,000,000 mg/kg

Bold = Detected concentration exceeds DEQ RBC for Leaching to Residential Groundwater Pathway
Bold, Red Text = Detected concentration exceeds DEQ RBC for Residential Vapor Intrusion Pathway
Yellow Highlight = Detected concentration exceeds DEQ RBC for Residential Direct Contact Pathway

TABLE 3– Summary of Soil Testing Results: Polynuclear Aromatic Hydrocarbons (PAHs)

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

						Sample Area ==>		UST Area		Barn/Shop								
						Sample Location ==>		P-2		P-5		P-4		P-4				
						Sample Number ==>		9862-220811-06		9862-220811-16		9862-220811-12		9862-220811-14				
						Sample Date ==>		11-Aug-22		11-Aug-22		11-Aug-22		11-Aug-22				
						Sample Depth ==>		8.5 - 9.0		7.0 - 7.5		5.0 - 5.5		12.0 - 12.5				
PAHs by EPA Method 8270C SIM						Risk-Screening Levels in mg/kg (ppm) ¹					Analytical Testing Results mg/kg (ppm)							
Analytes						Leaching to Groundwater (Residential)	Vapor Intrusion (Residential)	Direct Contact (Residential)	Direct Contact (Construction Worker)	Direct Contact (Excavation Worker)								
Anthracene						>Csat	>Max	23,000.	110,000.	ne	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Acenaphthene						>Csat	>Csat	4,700.	21,000.	590,000.	0.00775	U	0.0074	0.00763	U	0.0146		
Acenaphthylene						ne	ne	ne	ne	ne	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Benzo (a) anthracene						1.6	>Csat	1.1	170.	4,800.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Benzo (a) pyrene						4.4	nv	0.11	17.	490.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Benzo (b) fluoranthene						>Csat	nv	1.1	170.	4,900.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Benzo (ghi) perylene						ne	ne	ne	ne	ne	0.00775	U	0.00693	U	0.00763	U	0.0123	
Benzo (k) fluoranthene						>Csat	nv	11.	1,700.	49,000.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Chrysene						>Csat	nv	110.	17,000.	490,000.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Dibenzo (a,h) anthracene						>Csat	nv	0.11	17.	490.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Fluoranthene						>Csat	nv	2,400.	10,000.	280,000.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Fluorene						>Csat	>Max	3,100.	14,000.	390,000.	0.00775	U	0.0073	0.00763	U	0.0179		
Indeno (1,2,3-cd) pyrene						>Csat	nv	1.1	170.	4,900.	0.00775	U	0.00693	U	0.00763	U	0.00667	U
Naphthalene						0.077	6.4	5.3	580.	16,000.	0.169		0.086	0.0254	U	0.0222	U	
Phenanthrene						ne	ne	ne	ne	ne	0.00775	U	0.0105	0.00763	U	0.0258		
Pyrene						>Csat	>Max	1,800.	7,500.	210,000.	0.00775	U	0.00693	U	0.00763	U	0.0122	
1-Methylnaphthalene						ne	ne	ne	ne	ne	0.0519		0.0743	0.0254	U	0.09		
2-Methylnaphthalene						ne	ne	ne	ne	ne	0.0664		0.0918	0.0254	U	0.0978		
2-Chloronaphthalene						ne	ne	ne	ne	ne	0.0258	U	0.0231	U	0.0254	U	0.0222	U

bgs = below ground surface
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram

ne = not established
nv = non-volatile
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million

U = not detected above concentration indicated
>Csat = This soil RBC exceeds the limit of three phase partitioning
>Max = RBC is greater than 1,000,000 mg/kg

1 = DEQ Risk-Based Concentration (RBC), May 2018, for indicated pathway
Bold = Detected concentration exceeds DEQ RBC for Leaching to Residential Groundwater Pathway
Bold, Red Text = Detected concentration exceeds DEQ RBC for Residential Vapor Intrusion Pathway
Yellow Highlight = Detected concentration exceeds DEQ RBC for Residential Direct Contact Pathway
Orange Highlight = Detected concentration exceeds DEQ RBC for Construction or Excavation Worker

TABLE 4– Summary of Soil Testing Results: Metals

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

Risk-Screening Levels in mg/kg (ppm) ¹					Arsenic	Barium	Cadmium	Chromium ³	Lead	Selenium	Silver	Mercury
Residential Leaching to Groundwater RBC ==>					ne	ne	ne	ne	30.	ne	ne	ne
RBC for Direct Contact (Residential) ==>					0.43	1.5E+04	78.	120,000.	400.	ne	390.	23.
RBC for Direct Contact (Excavation Worker) ==>					420.	>Max	9,700.	>Max	800.	ne	49,000.	2,900.
RBC for Direct Contact (Construction Worker) ==>					15.	69,000.	350.	5.3E+05	800.	ne	1,800.	110.
Background ² ==>					18.	730.	2.6	100.	28.	0.68	0.33	0.07

Laboratory Testing Results in mg/kg (ppm)

Boring Location	Sample ID	Sample Area	Sample Date	Sample Depth (feet bgs)	Total Metals by EPA Method 6010B, 7471A							
					Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury
P-5	9862-220811-16	UST	11-Aug-22	7 - 7.5	9.71	637.	0.099 U	53.5	12.3	0.21 U	0.1 U	0.063

bgs = below ground surface
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ne = not established

ppm = parts per million
U = not detected above concentration indicated
>Max = RBC is greater than 1,000,000 mg/kg

1 = DEQ Risk-Based Concentration (RBC), May 2018, for indicated pathway
2 = DEQ Default Background Concentrations for Metals in Soil (South Willamette Valley), March 2013
3 = DEQ RBC for Chromium (III)

Bold = Detected concentration exceeds Background and DEQ RBC for Leaching to Residential Groundwater Pathway

Yellow Highlight = Detected concentration exceeds Background and DEQ RBC for Residential Direct Contact Pathway

TABLE 5 – Summary of Groundwater Testing Results: TPH and VOCs

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

Area ==>				UST Area		Barn/Shop Area	
Boring Location ==>				P-1		P-4	
Sample ID==>				9862-220811-100		9862-220811-101	
Sample Date ==>				11-Aug-22		11-Aug-22	
Screen Interval (feet bgs) ==>				10.0 - 20.0		10.0 - 20.0	
Analytical Parameters	Risk-Screening Levels (ug/L) ¹			Analytical Testing Results (ug/L)			
	Residential Tapwater	Residential Vapor Intrusion	Groundwater In Excavation				
Gasoline-Range Total Petroleum Hydrocarbons by NW Method TPH-Gx							
Gasoline-Range Organics	110.	22,000	14,000.	100	U	100	U
Diesel- and Oil-Range Total Petroleum Hydrocarbons by NW Method TPH-Dx							
Diesel-Range Organics	100.	>S	>S	100	U	450	
Oil-Range Organics ²	300.	>S	>S	250	U	250	U
Volatile Organic Compounds by EPA Method 8260B							
Acetone	ne	ne	ne	50	U	50	U
Acrolein	ne	ne	ne	50	U	50	U
Acrylonitrile	0.052	700.	250.	10	U	10	U
Benzene	0.46	210.	1,800.	1	U	1	U
Bromobenzene	ne	ne	ne	1	U	1	U
Bromodichloromethane	0.13	180.	450.	1	U	1	U
Bromoform	3.3	36,000.	14,000.	1	U	1	U
Bromomethane	7.5	2,100.	1,200.	5	U	5	U
N-Butylbenzene	ne	ne	ne	1	U	1	U
Sec-Butylbenzene	ne	ne	ne	1	U	1	U
Tert-Butylbenzene	ne	ne	ne	1	U	1	U
Carbon Tetrachloride	0.46	92.	1,800.	1	U	1	U
Chlorobenzene	77.	67,000.	10,000.	1	U	1	U
Chlorodibromomethane	0.17	980.	610.	1	U	1	U
Chloroethane	21,000.	2,800,000.	2,400,000.	5	U	5	U
Chloroform	0.22	120.	720.	5	U	5	U
Chloromethane	190.	26,000.	22,000.	2.5	U	2.5	U
2-Chlorotoluene	ne	ne	ne	1	U	1	U
4-Chlorotoluene	ne	ne	ne	1	U	1	U
1,2-Dibromo-3-Chloropropane	ne	ne	ne	5	U	5	U
1,2-Dibromoethane (EDB)	0.008	45.	27.	1	U	1	U
Dibromomethane	ne	ne	ne	1	U	1	U
1,2-Dichlorobenzene	300.	>S	37,000.	1	U	1	U
1,3-Dichlorobenzene	ne	ne	ne	1	U	1	U
1,4-Dichlorobenzene	0.48	540.	1,500.	1	U	1	U
Dichlorodifluoromethane	ne	ne	ne	5	U	5	U
1,1-Dichloroethane	2.8	1,100.	10,000.	1	U	1	U
1,2-Dichloroethane (EDC)	0.17	300.	630.	1	U	1	U
1,1-Dichloroethene	280.	29,000.	44,000.	1	U	1	U
Cis-1,2-Dichloroethene	36.	>S	18,000.	1	U	1	U
Trans-1,2-Dichloroethene	360.	>S	180,000.	1	U	1	U
1,2-Dichloropropane	ne	ne	ne	1	U	1	U
1,1-Dichloropropene	ne	ne	ne	1	U	1	U
1,3-Dichloropropane	ne	ne	ne	1	U	1	U
Cis-1,3-Dichloropropene	ne	ne	ne	1	U	1	U
Trans-1,3-Dichloropropene	ne	ne	ne	1	U	1	U
2,2-Dichloropropane	ne	ne	ne	1	U	1	U

TABLE 5 – Summary of Groundwater Testing Results: TPH and VOCs

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

				Area ==>	UST Area		Barn/Shop Area	
				Boring Location ==>	P-1		P-4	
				Sample ID==>	9862-220811-100		9862-220811-101	
				Sample Date ==>	11-Aug-22		11-Aug-22	
				Screen Interval (feet bgs) ==>	10.0 - 20.0		10.0 - 20.0	
Analytical Parameters	Risk-Screening Levels (ug/L) ¹			Analytical Testing Results (ug/L)				
	Residential Tapwater	Residential Vapor Intrusion	Groundwater In Excavation					
Di-Isopropyl Ether	ne	ne	ne	1	U	1	U	
Ethylbenzene	1.5	620.	4,500.	1	U	1	U	
Hexachloro-1,3-Butadiene	ne	ne	ne	1	U	1	U	
Isopropylbenzene	440.	>S	51,000.	1	U	1	U	
P-Isopropyltoluene	ne	ne	ne	1	U	1	U	
2-Butanone (MEK)	ne	ne	ne	10	U	10	U	
Methylene Chloride	11.	90,000.	640,000.	5	U	5	U	
4-Methyl-2-Pentanone (MIBK)	ne	ne	ne	10	U	10	U	
Methyl Tert-Butyl Ether (MTBE)	14.	67,000.	63,000.	1	U	1	U	
Naphthalene	0.17	840.	500.	5	U	5	U	
N-Propylbenzene	ne	ne	ne	1	U	1	U	
Styrene	1,200.	>S	170,000.	1	U	1	U	
1,1,1,2-Tetrachloroethane	ne	ne	ne	1	U	1	U	
1,1,2,2-Tetrachloroethane	ne	ne	ne	1	U	1	U	
1,1,2-Trichlorotrifluoroethane	55,000.	>S	>S	1	U	1	U	
Tetrachloroethene	12.	3,700.	5,600.	1	U	1	U	
Toluene	1,100.	>S	220,000.	1	U	1	U	
1,2,3-Trichlorobenzene	ne	ne	ne	1	U	1	U	
1,2,4-Trichlorobenzene	ne	ne	ne	1	U	1	U	
1,1,1-Trichloroethane	8,000.	>S	1,100,000.	1	U	1	U	
1,1,2-Trichloroethane	0.28	870.	49.	1	U	1	U	
Trichloroethene	0.49	200.	430.	1	U	1	U	
Trichlorofluoromethane	1,100.	36,000.	160,000.	5	U	5	U	
1,2,3-Trichloropropane	ne	ne	ne	2.5	U	2.5	U	
1,2,4-Trimethylbenzene	54.	50,000.	6,300.	1	U	1	U	
1,2,3-Trimethylbenzene	ne	ne	ne	1	U	1	U	
1,3,5-Trimethylbenzene	59.	86,000	7,500.	1	U	1	U	
Vinyl Chloride	0.027	17.	960.	1	U	1	U	
Xylenes, Total	190.	86,000.	23,000.	3	U	3	U	

1 = DEQ Risk-Based Concentration (RBC), May 2018, for indicated pathway
2 = for mineral oil or insulating oil

bgs = below ground surface
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
ne = not established
NT = not tested
>S = Groundwater RBC exceeds the solubility limit

TPH = total petroleum hydrocarbons
U = not detected above indicated value
ug/L = micrograms per liter
VOCs = volatile organic compounds
Bold = Detected concentration

Bold, Blue Text = Detected concentration exceeds DEQ RBC for Residential Tap Water Ingestion
Yellow Highlight = Detected concentration exceeds DEQ RBC for Residential Vapor Intrusion Pathway
Orange Highlight, Red Text = Detected concentration exceeds DEQ RBC for Groundwater in Excavation

TABLE 6 – Summary of Groundwater Testing Results: PAHs

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

Area ==>				UST Area		Barn/Shop Area	
Boring Location ==>				P-1		P-4	
Sample ID==>				9862-220811-100		9862-220811-101	
Sample Date ==>				11-Aug-22		11-Aug-22	
Screen Interval (feet bgs) ==>				10.0 - 20.0		10.0 - 20.0	
Analytical Parameters	Risk Screening Levels (ug/L) ¹			Analytical Testing Results (ug/L)			
	Residential Vapor Intrusion	Residential Tapwater	Groundwater in Excavation				
Anthracene	>S	>S	>S	0.05	U	0.05	U
Acenaphthene	>S	510	>S	0.05	U	0.05	U
Acenaphthylene	ne	ne	ne	0.05	U	0.05	U
Benzo (a) anthracene	>S	0.03	>S	0.05	U	0.0574	
Benzo (a) pyrene	NV	0.025	>S	0.05	U	0.0546	
Benzo (b) fluoranthene	NV	0.25	>S	0.05	U	0.052	
Benzo (ghi) perylene	ne	ne	ne	0.05	U	0.0674	
Benzo (k) fluoranthene	NV	>S	>S	0.05	U	0.05	U
Chrysene	NV	>S	>S	0.05	U	0.055	
Dibenzo (a,h) anthracene	NV	0.025	>S	0.05	U	0.05	U
Fluoranthene	NV	>S	>S	0.1	U	0.144	
Fluorene	>S	280	>S	0.05	U	0.05	U
Indeno (1,2,3-cd) pyrene	NV	>Csat	>S	0.05	U	0.05	U
Naphthalene	840	0.17	500	0.25	U	0.25	U
Phenanthrene	ne	ne	ne	0.05	U	0.139	
Pyrene	>S	110	>S	0.05	U	0.167	
1-Methylnaphthalene	ne	ne	ne	0.25	U	0.25	U
2-Methylnaphthalene	ne	ne	ne	0.25	U	0.25	U
2-Chloronaphthalene	ne	ne	ne	0.25	U	0.25	U

1 = DEQ Risk-Based Concentration (RBC), May 2018, for indicated pathway

bgs = below ground surface

DEQ = Oregon Department of Environmental Quality

EPA = U.S. Environmental Protection Agency

J = estimated concentration below method reporting limit

ne = not established

Bold = Detected Concentration

Bold, Blue Text = Detected concentration exceeds DEQ RBC for Residential Tap Water Ingestion

Yellow Highlight = Detected concentration exceeds DEQ RBC for Residential Vapor Intrusion Pathway

Orange Highlight, Red Text = Detected concentration exceeds DEQ RBC for Groundwater in Excavation

PAHs = polynuclear aromatic hydrocarbons

>S = Groundwater RBC exceeds the solubility limit

SIM = single ion monitoring

U = not detected above concentration indicated

ug/L = micrograms/liter

TABLE 7– Groundwater Testing Results: Dissolved Metals

Phase II Environmental Site Assessment
Larsen Property
24716 SW Grand Ronde Road
Grand Ronde, Oregon

Risk-Screening Levels ¹ in ug/L (ppb)	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
Residential Tap Water Ingestion RBC ==>	0.052	4,000.	20.	30,000. ³	15.	6.	100. ²	100.
Groundwater in Excavation RBC ==>	6,300.	2.7E+07	130,000.	ne ²	ne	ne	ne	1,100,000.

Laboratory Testing Results in ug/L (ppb)

Boring Location	Area	Sample ID	Sample Date	Screen Depth (feet bgs)	Dissolved Metals by EPA Method 6020B/7470A (0.45-Micron Filtered Samples)							
P-1	UST Area	9862-220811-100	11-Aug-22	10.0 - 20.0	2. U	65.	1. U	2. U	2. U	0.2 U	2. U	2. U

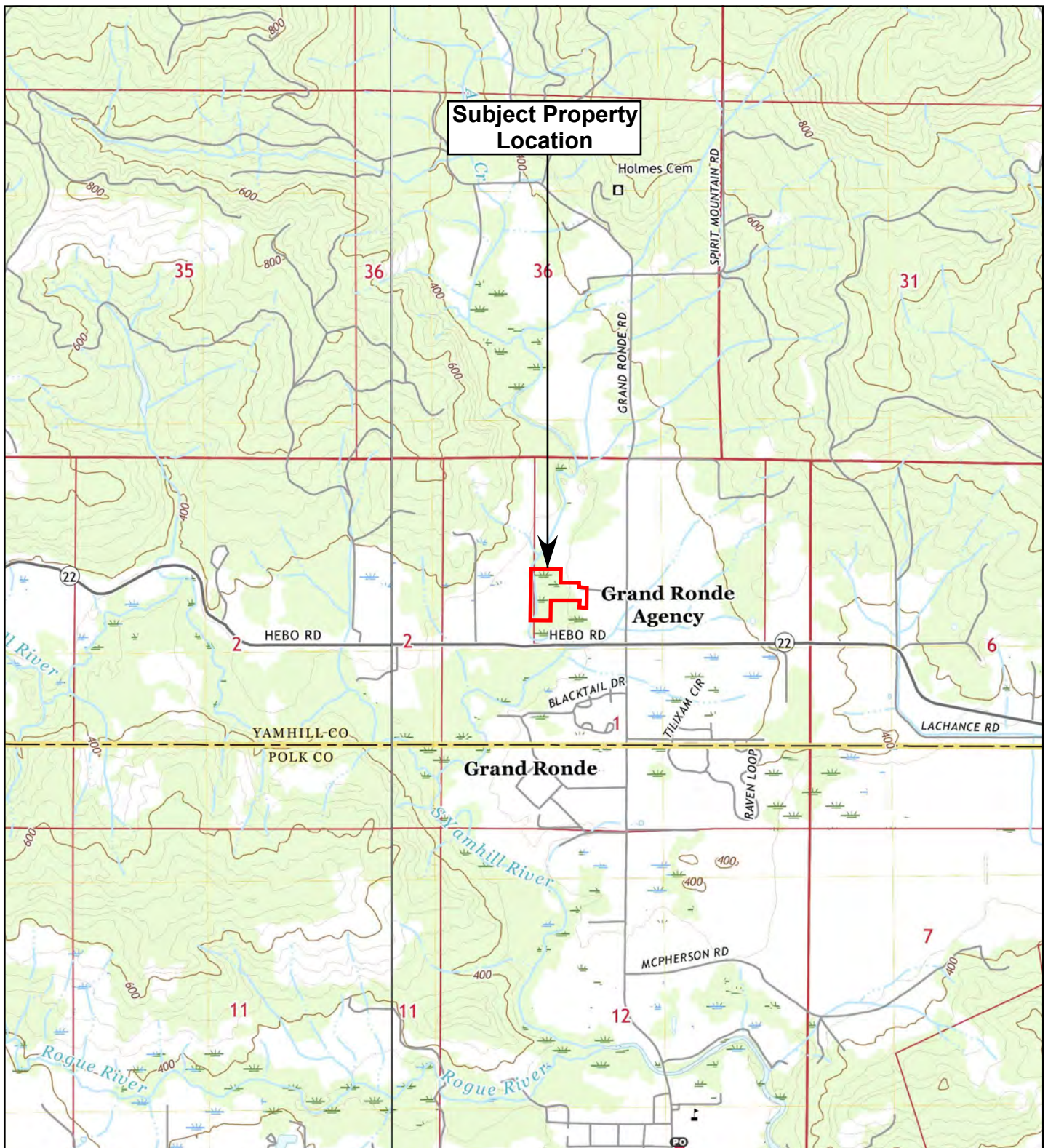
1 = DEQ Risk-Based Concentration (RBC), May 2018, for indicated pathway
2 = DEQ RBC (Chromium III)
3 = EPA Regional Screening Levels (RSLs), May 2022

bgs = below ground surface
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency

ne = not established
ppb = parts per billion
U = not detected above concentration indicated

Bold Text = Detected concentration
Blue Text = Detected concentration exceeds DEQ RBC for Residential Tap Water Ingestion
Orange Highlight, Red Text = Detected concentration exceeds DEQ RBC for Groundwater in Excavation

FIGURES



Note:
Base Map from the Grand Ronde, Oregon (1979)
USGS 7.5-Minute Quadrangle
Contour Intervals: 40 Feet

FIGURE 1 Location Map

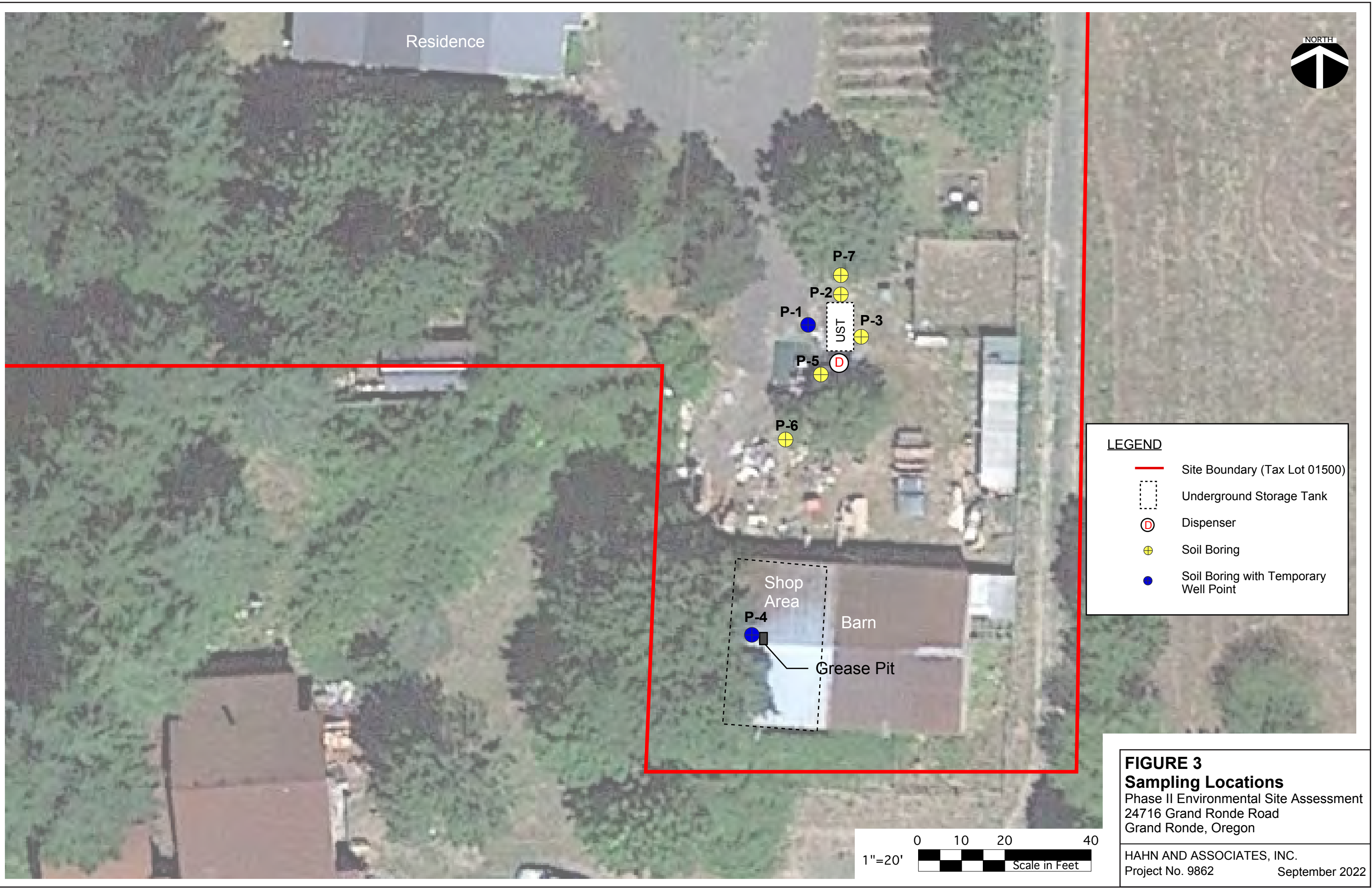
Phase II Environmental Site Assessment
Approximately 7.66-Acre Residential Property
24716 SW Grand Ronde Road
Grand Ronde, Yamhill County, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 9862

September 2022





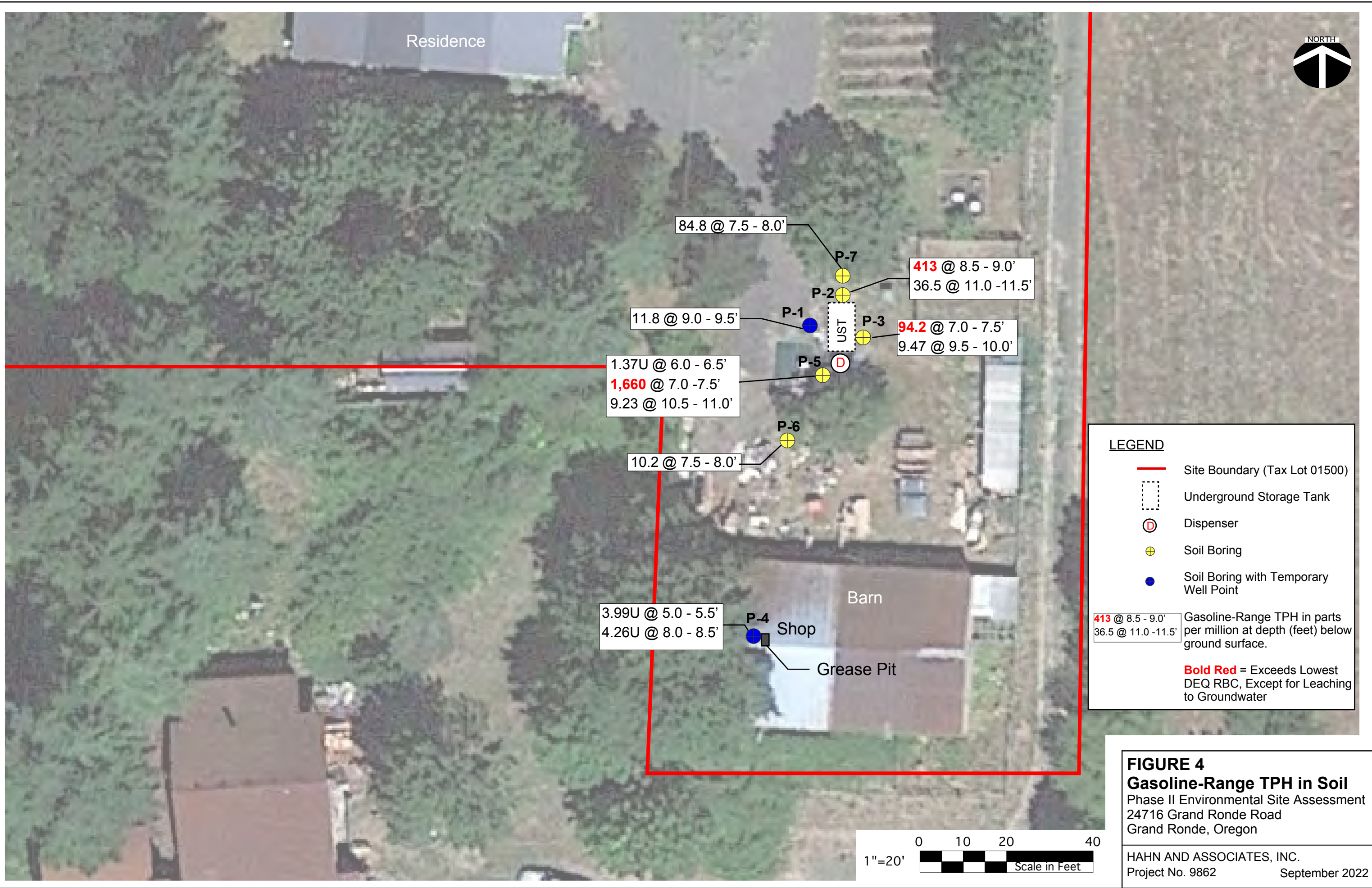


LEGEND

- Site Boundary (Tax Lot 01500)
- ⋯ Underground Storage Tank
- Ⓚ Dispenser
- ⊕ Soil Boring
- Soil Boring with Temporary Well Point

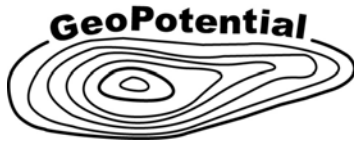
FIGURE 3
Sampling Locations
Phase II Environmental Site Assessment
24716 Grand Ronde Road
Grand Ronde, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 9862 September 2022



APPENDICES

Appendix A
Geophysical Report



ENVIRONMENTAL & EXPLORATION GEOPHYSICS

330 Creekside Terrace, Fairview, OR 97024 Phone: (503) 912-6441 Fax: (503) 912-6448
WEB <http://www.geopotential.biz/> E-MAIL GeoPotential@geopotential.biz

Letter Report

Subsurface Mapping Survey for
Underground Storage Tanks and Ancillary Utilities

Commercial Site
24716 SW Grand Ronde Road
Grand Ronde, Oregon

GeoPotential Project# 1413

Performed for:

Hahn and Associates, Inc.
434 NW Sixth Avenue, Suite 203
Portland, Oregon 97209

Survey Date: July 28, 2022

Report Date: August 1, 2022

Personnel: GeoPotential; Ralph Soule. HAI; Rob Ede

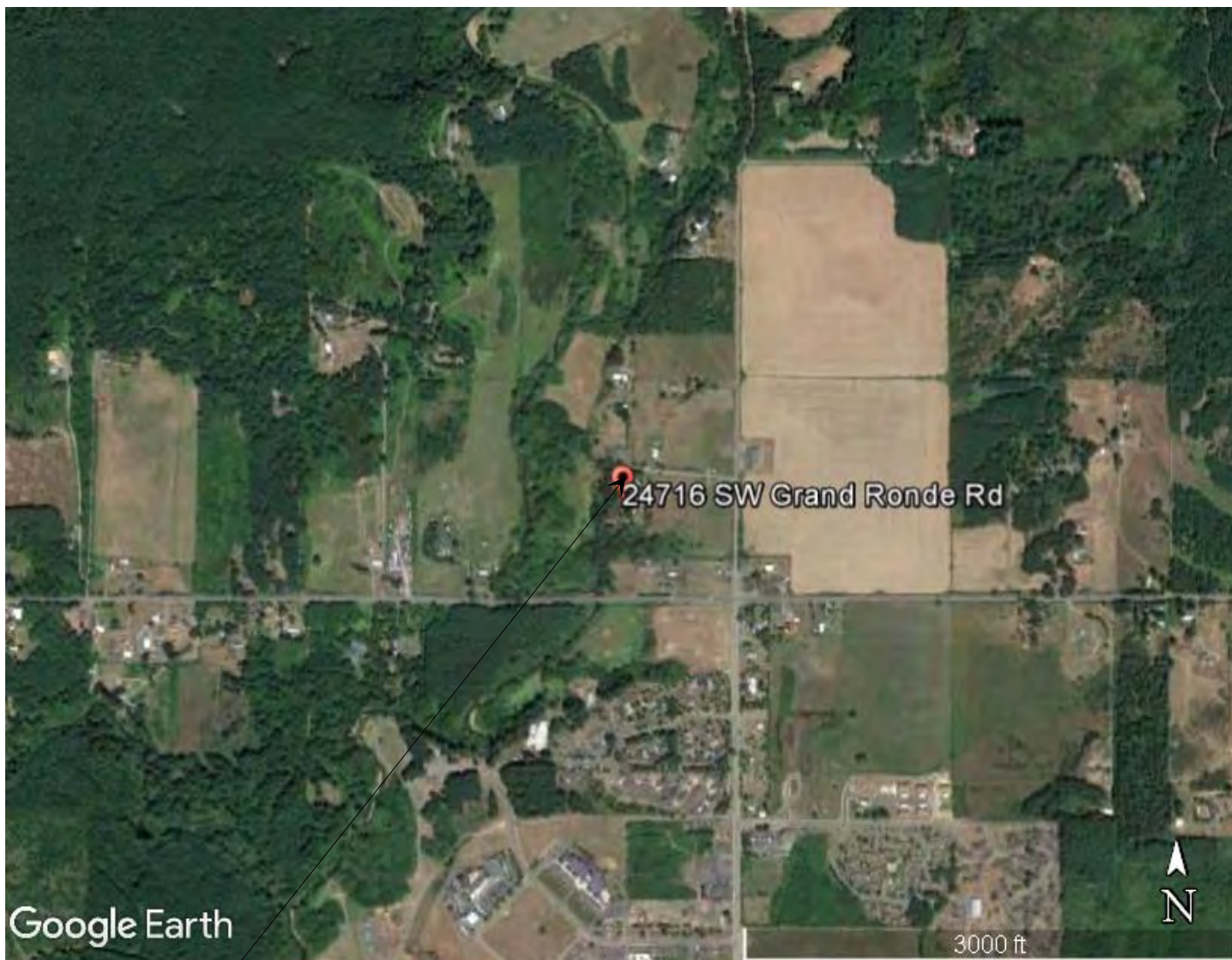
Geophysical Surveys Conducted: Ground Penetrating Radar (GPR) utilizing a Mala Easy Locator with a 425 MHz antenna. Magnetic scan with a Schonstedt GA52B Magnetic Gradiometer. Pipe and cable locating with a Heath Sure Lock and an Aqua-Tronics A6 Tracer.

Procedures: Surveys were conducted in the vicinity of a UST Pump dispenser. GPR Profiles and locating results were interpreted over the Site and marked on the Site with marking paint.

Results: Results are shown on Figure 2 and were marked at the site with marking paint.

The UST consisted of a 7x12 foot tank (2,500 gallon tank) buried at a depth of 2 feet bgs.

Other utilities in the vicinity of the UST were mapped and consisted of: Electrical lines (marked in Red) and a catch basin with an overflow drain line marked in green. A Subsurface Clearance Survey was conducted over seven proposed boring locations.

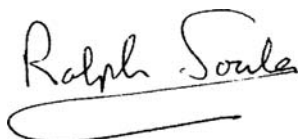




LIMITATIONS

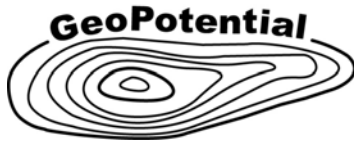
Limitations of GPR surveys can be seen in the Appendix.

Geophysical surveys consist of interpreting geophysical responses from subsurface features. Since a variety of subsurface features can produce identical geophysical responses, it is necessary to confirm the geophysical interpretation with intrusive investigations such as excavating or drilling. In addition, many subsurface features may produce no geophysical response.

A handwritten signature in black ink that reads "Ralph Soule". The signature is written in a cursive style with a long, sweeping underline.

Ralph Soule
GeoPotential

August 1, 2022



ENVIRONMENTAL & EXPLORATION GEOPHYSICS

330 Creekside Terrace, Fairview, OR 97024 Phone: (503) 912-6441 Fax: (503) 912-6448
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GROUND PENETRATING RADAR SURVEYS

Ground Penetrating Radar (GPR) can be a valuable tool to accurately locate both metallic and non-metallic UST's and utilities, buried drums and hazardous material at some sites. It may detect objects below reinforced concrete floors and slabs. GPR may delineate trenches and excavations and, under some conditions, it may be used to locate contaminant plumes. It has been used as an archaeological tool to look for buried artifacts. It may accurately profile fresh water lake bottoms either from a boat or from a frozen lake surface. GPR may be used to locate voids below roads and runways. GPR has numerous engineering applications. It can be used in non-destructive testing of engineering material, for example, locating rebar in concrete structures and determining the thickness of concrete and other structural material.

GPR uses short impulses of high frequency radio waves directed into the ground to acquire information about the subsurface. The energy radiated into the ground is reflected back to the antenna by features having different electrical properties to that of the surrounding material. The greater the contrast, the stronger the reflection. Typical reflectors include water table, bedrock, bedding, fractures, voids, contaminant plumes and man-made objects such as UST's and metal and plastic utilities. Materials having little electrical contrast like clay and concrete pipes may not produce strong reflections and may not be seen. Data are digitally recorded or downloaded to a laptop computer for filtering and processing.

The frequency of the radar signal used for a survey is a trade off. Low frequencies (250 MHz – 50 MHz) give better penetration but low resolution so that pipes and utilities may not be seen. Pipes and utilities may be seen using higher frequencies (500 MHz) but the depth of penetration may be limited to only a few feet especially in the wet, clayey soils found in many areas of the NW USA. The GPR frequency is dependent upon the antenna. Once an antenna is selected, nothing the operator can do can increase the depth of penetration.

Radar data is ambiguous. Many buried objects produce echoes that may be similar to the echo expected from the target object. Boulders and debris produce reflections that are similar to pipes and tanks. Subtle changes in the electrical properties along a traverse caused by changes in soil type, mineralogy, grain size, and moisture content all produce “noise” that can make interpretation difficult. Interpreting radargrams is an art as much as a science.

Under some conditions, although a UST itself may not be clearly visible in a GPR record, the excavation or trench in which the UST is buried is evident. Usually GPR data is used to compliment data from other “tools”. For example, a trench-like reflection but no clear UST reflection, combined with a “tank” shaped magnetic anomaly suggests the presence of a UST. Although the UST itself could not be seen using GPR, the radar showed a trench-like reflection. The magnetic data showed a large ferrous object. We would report a possible UST at that location.

GPR is often used in conjunction with magnetometer surveys. Magnetometer Surveys are very fast and large areas can be covered cost effectively. Magnetic anomalies are marked in the field, and then may be further investigated using radar.

GPR, like other geophysical tools, is excellent at detecting changes across a site, but it is poor at actually identifying the cause of the change. **The only definite way to identify buried objects is through excavation.**

ADVANTAGES - General

- When GPR data is properly interpreted subsurface objects can usually be confidently identified. This often requires the GPR data be combined with other geophysical data, surface features and historical information.
- GPR provides continuous records along traverses which, depending on the goal of the survey, may be interpreted in the field.
- At flat, open sites, for reconnaissance purposes, the antenna can be towed behind a vehicle at several mph.
- Many GPR antennas are shielded and are unaffected by surface and overhead objects and power lines.
- GPR can be used in conjunction with magnetic or EM surveys to accurately locate buried objects.

ADVANTAGES – Site specific

- With a low frequency antenna, in clean, dry, sandy soil, reflections from targets as deep as 100 feet are possible. Geologic features such as bedrock and cross bedding may be seen at some sites.
- The resolution of data is very high particularly for high frequency antennas.
- Shallow, man-made objects generally can be detected.
- Fiberglass UST's and plastic pipes can be detected using GPR.

LIMITATIONS - General

- To acquire the highest quality data, proper coupling between the antenna and the ground surface is necessary. Poor data may be obtained at sites covered with debris, an uneven surface, tall grass and brush. Objects located at curbs are difficult to see.
- Acquiring GPR data is slow. The antenna must be over the target. The signal from the antenna is cone-shaped. Reflections from objects to the side of the antenna may be seen, but their actual location relative to the antenna is not obvious.
- Penetration of the GPR signal is "site specific" and its depth of penetration at a particular site cannot be predicted ahead of time. Near surface conductive material, such as salty or contaminated ground water and wet, clay-rich soil, may attenuate the radar signal, limiting the effective depth of the survey to several feet. Reinforced concrete also can attenuate the signal. Rebar may produce reflections that look like pipes.

- GPR may not be cost-effective for some projects. For a detailed survey mapping underground storage tanks and utilities, it may be necessary to collect data in orthogonal directions at 5-foot line spacing.

LIMITATIONS – Interpretation

- Interpretation can be difficult. Radar data are ambiguous. Subsurface objects can be detected but, in general, they cannot be identified. USTs and utilities have a characteristic reflection, however, large rocks and boulders have a similar reflection.
- The reflection visible in a GPR record is very complex and may be caused by small changes in the electrical properties of the soil. The target in mind may not produce the reflection. Due to “noise”, the target may be missed. USTs and deep utilities may be missed if they are under debris and/or other pipes.
- Other methods may be necessary to aid in the interpretation of the data (use a magnetometer to detect a large metallic mass, then GPR to determine if the object is tank-like, or a utility locator to determine if there are feed lines and fill pipes leading to the object).
- Adequate contrast between the ground and the target is required to obtain reflections. UST’s may be missed if they are badly corroded. Utilities made of “earth” materials like clay and concrete may not be detected since their electrical properties are similar to the surrounding soil.
- To determine the depth to an object without "ground truth", assumptions must be made regarding soil properties. Even with ground truth at several locations on the same site, changes in material across a site (therefore changes in signal velocity) can cause errors in depth measurements at other locations.



Appendix B

Field Boring Logs and Groundwater Sampling Field Logs

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717		PUSH PROBE NUMBER P-1		Page 1 of 1									
PROJECT: Larsen Property 24716 SW Gran Ronde Rd Grand Ronde, Oregon PROJECT No. 9862		HAI LOGGER: Rob Ede SAMPLING METHOD: Macro Core DRILLING METHOD: Direct Push EQUIPMENT TYPE: 7822 DT DRILLER: Steven Eddins DRILLING CONTRACTOR: Holt Services, Inc.		<table border="1"> <tr> <td>DRILL START</td> <td>DRILL FINISH</td> </tr> <tr> <td>Time: 830</td> <td>Time: 935</td> </tr> <tr> <td>Date: 8/11/22</td> <td>Date: 8/11/22</td> </tr> </table>	DRILL START	DRILL FINISH	Time: 830	Time: 935	Date: 8/11/22	Date: 8/11/22			
DRILL START	DRILL FINISH												
Time: 830	Time: 935												
Date: 8/11/22	Date: 8/11/22												
ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Gx (ppm)	CORE INTERVAL	RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	BORING DIAMETER: 2.25-inch CASING DIAMETER: N/A SURFACE ELEVATION: Not Surveyed TOP OF CASING ELEVATION: N/A SOIL DESCRIPTION		
3/8" Bentonite chips							1			ML	Top Soil, grass surface w Root Mass		
							2				ML	Sandy SILT, brown, dry, nonplastic, crumbles, increased silt content, with orange mottling below 1.5' bgs. No OSD (0.5-5')	
							3						
							4						
								5				ML	Sandy SILT, brown, dry, nonplastic, hard, crumbles (5 to 8' bgs) No OSD.
							6						
							7						
							8				Note: Driller notes very hard drilling encountered at 8 feet bgs		
	01	844	12.5	11.8				9			SM	Silty SAND with Gravel, Grey, dry, hard, No OSD (8 to 10' bgs)	
							10					Note: Driller pushes 2.5 foot intervals due to hard substrate.	
								11			SM	Silty SAND, Grey, dry, brittle, No OSD (10 to 12.5' bgs)	
	02	848	11.8				12						
	NS		1.5				13					Silty SAND, AS ABOVE No OSD (12.5 to 17' bgs)	
	03	900	7.1				14						
								15			SM	Silty SAND, Grey, very hard, WET @ 17.5' BGS, wet zone is extending to 18' BGS, then dry below. No OSD (17 to 20 feet bgs)	
							16						
	04	923	12.0				17						
							18						
								19					
	05	930	0.2				20					At 20 feet BGS, Driller notes over 10 feet of water column in the borehole.	

▮ observed saturated soils
 ▮ measured water level
 NS = NO SAMPLE

Set Screen (PVC) 0.06" from 10 to 20 feet BGS.

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717		PUSH PROBE NUMBER P-2		Page 1 of 1								
PROJECT: Larsen Property 24716 SW Gran Ronde Rd Grand Ronde, Oregon PROJECT No. 9862		HAI LOGGER: Rob Ede SAMPLING METHOD: Macro Core DRILLING METHOD: Direct Push EQUIPMENT TYPE: 7822 DT DRILLER: Steven Eddins DRILLING CONTRACTOR: Holt Services, Inc.		DRILL START Time: 940 Date: 8/11/22								
				DRILL FINISH Time: 1030 Date: 8/11/22								
ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Gx (ppm)	CORE INTERVAL	RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	BORING DIAMETER: 2.25-inch CASING DIAMETER: N/A SURFACE ELEVATION: Not Surveyed TOP OF CASING ELEVATION: N/A	
3/8" Bentonite Chips					↑	↑	1			ML	Gravel w Grass/ashmass at surface. Sandy SILT, brown, dry, crumbly, non-plastic, No OSD 0-2-BGS.	
							2					
						↓	3					
								4				
						↑	↑	5		ML	SILT, tan with orange mottling, Dry, but with 6" moist zone from 8.5 to 9'-BGS. Two-inch thick zone of BLUE/GREY Discolored soil with petroleum odor at 8.5 to 9'-BGS Immediately above where driller notes drilling gets hard.	
							6					
							7					
								8				
	06	1015	143.0	413		↓	9					Driller reports HARD drilling at 9 feet bgs - liner temporarily stuck in sampler on 5 to 6 push.
						↑	↑	10				
	07	1021	12.2	3605		↑	↑	11		ML	SILT, grey, dry, compacted, brittle, almost lithified, No OSD (10 to 12-BGS)	
							12					
							13					
						↑	↑	14				Sandy SILT with minor gravel, DEP, grey, brittle, Hard, no OSD 12 to 15-BGS
		08	1028	6.4		↓	↓	15				
							16				Terminate Boring at 15-BGS	
							17					
							18					
							19					
							20					

* Sample No. Prefix:

9862-220811-

GW Sample Info:

(NO GW SAMPLE)

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717		PUSH PROBE NUMBER P-3		Page 1 of 1								
PROJECT: Larsen Property 24716 SW Gran Ronde Rd Grand Ronde, Oregon PROJECT No. 9862		HAI LOGGER: Rob Ede SAMPLING METHOD: Macro Core DRILLING METHOD: Direct Push EQUIPMENT TYPE: 7822 DT DRILLER: Steven Eddins DRILLING CONTRACTOR: Holt Services, Inc.		DRILL START: 1032 DRILL FINISH: 1100 Date: 8/11/22 Date: 8/11/22								
ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Gx (ppm)	CORE INTERVAL	RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	BORING DIAMETER: 2.25-inch CASING DIAMETER: N/A SURFACE ELEVATION: Not Surveyed TOP OF CASING ELEVATION: N/A	
3/8" Bentonite Chips							1			ML	Grass/Root Mass in upper 6" BGS Sandy SILT, brown, loose, dry, non-plastic, No OSD (0 to 2") SILT, brown with orange mottling, dry, stiff, non- plastic, No OSD (2 to 5")	
							2					
							3					
								4				
								5				
								6		ML	SILT, As above to 7.5' and then grey, hard silt with minor Gravel (brittle).	
							7					
		09	1040	23.4	94.2			8			ML w/ Gravel	Note: The brown silt above the hard brittle silt has a minor petroleum hydrocarbon odor. No OSD beneath 7.5' bgs.
							9					
		10	1045	12.6	9.47			10			ML	Sandy SILT, grey, brittle, dry, very hard, non-plastic, No OSD (8 to 10")
							11					
		11	1050	1.8				12				Sandy SILT, As Above, No OSD (10 to 12.5")
							13					
							14					
							15			1/2"	Boring Terminated at 12.5' bgs	
							16					
							17					
							18					
							19					
							20					

* Sample No. Prefix: 9862-220811-

GW Sample Info:

(No GW Sample)

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717		PUSH PROBE NUMBER p-4		Page 1 of 1							
PROJECT: Larsen Property 24716 SW Gran Ronde Rd Grand Ronde, Oregon PROJECT No. 9862		HAI LOGGER: Rob Ede SAMPLING METHOD: Macro Core DRILLING METHOD: Direct Push EQUIPMENT TYPE: 7822 DT DRILLER: Steven Eddins DRILLING CONTRACTOR: Holt Services, Inc.		DRILL START Time: 1:25 Date: 8/11/22	DRILL FINISH Time: 12:00 Date: 8/11/22						
ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Gx (ppm)	CORE INTERVAL	RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
concrete					↑	↓	1				concrete floor
3/8" Bentonite Chips	NS	0.3				↓	2			ML	SILT, slightly moist, brown, becomes grey below 18" (with orange mottling), non plastic No OSD (0-5')
							3				
							4				
	12	1115	2.6	ND	↑	↑	5				SILT, tan with orange mottling, slightly moist, minor rounded gravel, No OSD to 8.5' bgs
							6				
							7				
	13	1118	14.7	ND	↑	↓	8				Sandy SILT, Grey, very hard (very hard drilling), Dry, minor gravel, No OSD (9 to 11' bgs)
							9				
							10				
							11				
	14	1128	5.4		↑	↑	12				Silty SAND with minor Gravel, Grey, Dry, very hard, No OSD (14 to 17' bgs)
							13				
							14				
							15				Silty SAND with minor Gravel, As Above but becoming WET at 17' bgs (No OSD) (17 to 19' BGS)
							16				
	NS	0.4			↑	↑	17				set well point screen (0.10/0.5) From 9' to 19' BGS.
							18				Boring Terminated at 19' bgs
							19				Groundwater measured at 15.2' bgs after install point.
							20				

✓ observed saturated soils
 ✗ measured water level
 NS No sample

ND = Not Detected

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717		PUSH PROBE NUMBER P-5		Page 1 of 1							
PROJECT: Larsen Property 24716 SW Gran Ronde Rd Grand Ronde, Oregon PROJECT No. 9862		HAI LOGGER: Rob Ede SAMPLING METHOD: Macro Core DRILLING METHOD: Direct Push EQUIPMENT TYPE: 7822 DT DRILLER: Steven Eddins DRILLING CONTRACTOR: Holt Services, Inc.		DRILL START Time: 1208 Date: 8/11/22 DRILL FINISH Time: 1242 Date: 8/11/22							
ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWPH-Gx (ppm)	CORE INTERVAL	RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	BORING DIAMETER: 2.25-inch CASING DIAMETER: N/A SURFACE ELEVATION: Not Surveyed TOP OF CASING ELEVATION: N/A
SOIL DESCRIPTION											
Grass/Root Mass at surface Sandy SILT, brown, soft, dry (0 to 2") No OSD SILT, tan with orange mottling, dry, non-plastic, stiff, No OSD (2 to 5") SILT - As Above to 7.5 bgs - No OSD to ± 7.4 bgs. Approx 2" zone of discolor and odor directly above the hard drilling at 7.5 bgs. Silty SAND with Gravel, grey, dry, hard (very hard drilling) - Dry, No OSD (7.5 to 9") Silty SAND with Gravel, as above but thin wet zone at 12 feet bgs (increased gravel content?) Sandy SILT with minor Gravel, grey, dry, hard, No OSD, below the thin wet zone at 12 feet bgs. Set a well point (0.10" screen) from 3 to 13 feet. Well point is Dry after install. Measure depth to water at 1355 and well point is still Dry. Remove well point with no sample											
3/8" Bentonite Chips 15 1215 6.4 ND 16 1218 178.2 1660 17 1225 12.2 9.23 18 1235 —											
14 15 16 17 18 19 20											

Observed saturated soil

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717		PUSH PROBE NUMBER P-6		Page 1 of 1							
PROJECT: Larsen Property 24716 SW Gran Ronde Rd Grand Ronde, Oregon		HAI LOGGER: Rob Ede SAMPLING METHOD: Macro Core DRILLING METHOD: Direct Push EQUIPMENT TYPE: 7822 DT DRILLER: Steven Eddins		DRILL START Time: 1245 Date: 8/11/22	DRILL FINISH Time: 1258 Date: 8/11/22						
PROJECT No. 9862		DRILLING CONTRACTOR: Holt Services, Inc.									
ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NMTPH-Gx (ppm)	CORE INTERVAL	RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	BORING DIAMETER: 2.25-inch
											CASING DIAMETER: N/A
											SURFACE ELEVATION: Not Surveyed
											TOP OF CASING ELEVATION: N/A
SOIL DESCRIPTION											
Grass w Root Mass at surface											
ML SILT, brown, with minor gravel, non-plastic, Dry, No OSD (0 to 1.5' bgs)											
ML SILT, brown with orange mottling, stiff, non-plastic, Dry, No OSD (1.5 to 5.0' bgs)											
ML SILT, AS Above, Dry to 6 feet bgs w a very thin moist zone at 6' bgs. Dry below 6', No OSD (1.5 to 8')											
SM + Gravel Silty SAND with Minor Gravel, Grey, Dry, very hard (hard drilling) No OSD (8 to 10')											
Note: collect sample - 19 in silt immediately above the very hard silty sand (No OSD)											
END of Boring at 10' bgs											

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon 97209
(503) 796-0717

PUSH PROBE NUMBER

P-7

Page 1 of 1

PROJECT:
Larsen Property
24716 SW Gran Ronde Rd
Grand Ronde, Oregon
PROJECT No. 9862

HAI LOGGER: Rob Ede
SAMPLING METHOD: Macro Core
DRILLING METHOD: Direct Push
EQUIPMENT TYPE: 7822 DT
DRILLER: Steven Eddins
DRILLING CONTRACTOR: Holt Services, Inc.

DRILL START Time: 1300 Date: 8/11/22
DRILL FINISH Time: 1300 Date: 8/11/22

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NMTPH-Gx (ppm)	CORE INTERVAL	RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	BORING DIAMETER:	CASING DIAMETER:	SURFACE ELEVATION:	TOP OF CASING ELEVATION:	SOIL DESCRIPTION
3/8" Bentonite Chips							1				2.25-inch	N/A	Not Surveyed	N/A	Grass w Root Mass at surface
							2			ML					Sandy SILT, brown, non-plastic
							3								Dry, No OSD (0 to 1.5')
							4								SILT, brown with orange
							5								mottling, stiff, dry, non-
							6								plastic, No OSD (1.5 to 5 bgs)
							7			ML					SILT, As Above with
							8								a very thin zone that
							9								has a very slight petroleum
							10			Sm + Grav					hydrocarbon odor (but
	20	1305	7.2	84.0			11								No discoloration) just
							12								above 8' bgs where
							13								Drilling becomes HARD. (5 to 8')
							14								(Collect sample - 20 within
							15								zone of mhor petroleum
							16								odor).
							17								Boring Ended at 10' bgs
							18								Silty SAND with mhor
							19								gravel, Grey, Dry,
							20								Very hard, No OSD

* Sample No. Prefix:

9862-220811-

GW Sample Info:

(No GW Sample)

OSD = odor, sheen by sheen test, discoloration

Direct Push Well Point Sampling Field Log

Boring Number: **P-1**
Date: **8/11/22**

Page 1 of 1

Project Information	
Project Name:	Larsen Property
HAI Project Number:	9862

Well Point Information	
Placement:	Direct Push Open Hole (circle one)
Type of Well Point:	Stainless PVC (describe) (circle one)
Screen Interval:	10 to 20 feet bgs

Sampling Information	
Field Team:	Rob Ede
Purge Method:	Peristaltic
Sampling Method:	Disposable Poly Tubing
Decontamination Method:	new Disposable Equip.
Purge Water Disposition:	TO GROUND

Sample Containers				Filtered?
Number	Type	Preservative	Analytical Parameters	
2	100ml	HCl	Dx	
6	40ml	HCl	Gx and VOCs	
2	40ml	None	PAHs 8270D SIM	
1	250ml	HNO3	Metals (Dissolved)	Y

Comments:	Did well point purge dry? NO.

Well Point Purge Data										
Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/Remarks
1310			Initial 9.0							
1317	4		9.8							Turbid VC
1325	6		10.7							clearing
1330	7		11.5							↓
1348	10		12.3	215	73°F	7.69				CI
1350				Sample Number: 9862-220811-100						

Note: bgs=below ground surface DTW=depth to water Lpm=liters per minute
Clarity: VCI=very cloudy CI=cloudy SCI=slightly cloudy AC=almost clear C=clear CC=crystal clear

Direct Push Well Point Sampling Field Log

Boring Number: **P-4**

Page 1 of 1

Date: **8/11/22**

Project Information

Project Name: **Larsen Property**

HAI Project Number: **9862**

Well Point Information

Placement: **Direct Push** **Open Hole** (circle one)

Type of Well Point: **Stainless** **PVC** (describe) (circle one)

Screen Interval: **9** to **19** feet bgs

Sampling Information

Field Team: **Rob Ede**

Purge Method: **Peristaltic**

Sampling Method: **Disposable Poly Tubing**

Decontamination Method:

New Disposable Equip

Purge Water Disposition:

To Ground

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	100ml	HCl	Dx	
6	40ml	HCl	Gx and VOCs	
2	40ml	None	PAHs 8270D SIM	
1	250ml	HNO3	Metals (Dissolved)	Y

Comments:

Did well point purge dry?

Yes. well point P-4 produced at only a very low rate and would dry up after 40 to 80ml (after initial take to dryness)

Well Point Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/Remarks
1135			Initial 15.2							
1140										Turbid VC
1145										DRY
										(Let Recharge while we continue drilling other boring locations)
1355	0.5L		14.5							DRY
1450										(Let recharge)
										Begin sampling. 40 to 80 ml at a time and then dry - Giving 5 minutes to recharge between sampling increments.
1530										Sample Number: 9862-220811-101

Note: bgs=below ground surface DTW=depth to water Lpm=liters per minute

Clarity: VCI=very cloudy CI=cloudy SCI=slightly cloudy AC=almost clear C=clear CC=crystal clear

Boring Number:	P-5
Date:	8/11/22

Page 1 of

Project Information

Well Point Information

Sampling Information

Sample Containers

Comments:

Well Point Purge Data

Note: bgs=below ground surface DTW=depth to water Lpm=liters per minute
Clarity: VCI=very cloudy CI=cloudy SCI=slightly cloudy AC=almost clear C=clear CC=crystal clear

Appendix C

Laboratory Reports and Chain-of-Custody Documentation: Soil and Groundwater

Hahn & Associates, Inc.

Sample Delivery Group: L1525184
Samples Received: 08/13/2022
Project Number: 9862
Description: Larsen Property
Site: 24716 SW GRAND RONDE RD
Report To: Rob Ede
434 NW 6th Avenue
Ste. 203
Portland, OR 97209

Entire Report Reviewed By:



Brian Ford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	6
Sr: Sample Results	7
9862-220811-100 L1525184-01	7
9862-220811-101 L1525184-02	10
9862-220811-01 L1525184-03	13
9862-220811-06 L1525184-08	14
9862-220811-07 L1525184-09	17
9862-220811-09 L1525184-11	18
9862-220811-10 L1525184-12	19
9862-220811-12 L1525184-14	20
9862-220811-13 L1525184-15	21
9862-220811-14 L1525184-16	22
9862-220811-15 L1525184-17	23
9862-220811-16 L1525184-18	24
9862-220811-17 L1525184-19	27
9862-220811-19 L1525184-21	28
9862-220811-20 L1525184-22	29
Qc: Quality Control Summary	30
Total Solids by Method 2540 G-2011	30
Mercury by Method 7470A	33
Mercury by Method 7471B	34
Metals (ICPMS) by Method 6020B	35
Volatile Organic Compounds (GC) by Method NWTPHGX	37
Volatile Organic Compounds (GC/MS) by Method 8260D	40
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	55
Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM	58
Gl: Glossary of Terms	64
Al: Accreditations & Locations	66
Sc: Sample Chain of Custody	67

¹ Cp
² Tc
³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

SAMPLE SUMMARY

9862-220811-100 L1525184-01 GW

Collected by Rob Ede Collected date/time 08/11/22 13:50 Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7470A	WG1910563	1	08/14/22 10:29	08/15/22 11:42	MRW	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1911350	1	08/16/22 22:27	08/17/22 18:52	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1913331	1	08/20/22 07:44	08/20/22 07:44	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1912633	1	08/18/22 06:12	08/18/22 06:12	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1912551	1	08/17/22 07:40	08/18/22 17:08	MWS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM	WG1911148	1	08/16/22 09:25	08/16/22 21:03	AMG	Mt. Juliet, TN

9862-220811-101 L1525184-02 GW

Collected by Rob Ede Collected date/time 08/11/22 15:30 Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1913331	1	08/20/22 08:06	08/20/22 08:06	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1912633	1	08/18/22 06:32	08/18/22 06:32	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1912551	1	08/17/22 07:40	08/18/22 17:34	MWS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM	WG1911148	1	08/16/22 09:25	08/16/22 20:43	AMG	Mt. Juliet, TN

9862-220811-01 L1525184-03 Solid

Collected by Rob Ede Collected date/time 08/11/22 08:44 Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1912568	25	08/11/22 08:44	08/17/22 21:13	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 20:36	JAS	Mt. Juliet, TN

9862-220811-06 L1525184-08 Solid

Collected by Rob Ede Collected date/time 08/11/22 10:15 Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1912568	500	08/11/22 10:15	08/17/22 23:08	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1911531	1	08/11/22 10:15	08/16/22 18:07	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 19:44	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM	WG1913753	1	08/20/22 10:42	08/21/22 10:26	AMG	Mt. Juliet, TN

9862-220811-07 L1525184-09 Solid

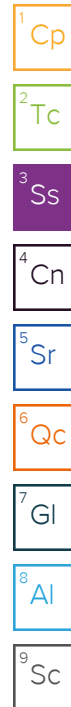
Collected by Rob Ede Collected date/time 08/11/22 10:21 Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1912568	26.8	08/11/22 10:21	08/17/22 21:36	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 22:08	JAS	Mt. Juliet, TN

9862-220811-09 L1525184-11 Solid

Collected by Rob Ede Collected date/time 08/11/22 10:40 Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	28	08/11/22 10:40	08/16/22 09:58	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 19:57	JAS	Mt. Juliet, TN



SAMPLE SUMMARY

9862-220811-10 L1525184-12 Solid

Collected by Rob Ede
Collected date/time 08/11/22 10:45
Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	28.7	08/11/22 10:45	08/16/22 10:21	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 20:49	JAS	Mt. Juliet, TN

¹ Cp

² Tc

³ Ss

⁴ Cn

9862-220811-12 L1525184-14 Solid

Collected by Rob Ede
Collected date/time 08/11/22 11:15
Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	26	08/11/22 11:15	08/16/22 10:44	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/17/22 09:49	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM	WG1913753	1	08/20/22 10:42	08/21/22 10:43	AMG	Mt. Juliet, TN

⁵ Sr

⁶ Qc

⁷ Gl

9862-220811-13 L1525184-15 Solid

Collected by Rob Ede
Collected date/time 08/11/22 11:18
Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	28.5	08/11/22 11:18	08/16/22 11:07	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/17/22 09:36	JAS	Mt. Juliet, TN

⁸ Al

⁹ Sc

9862-220811-14 L1525184-16 Solid

Collected by Rob Ede
Collected date/time 08/11/22 11:28
Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1913792	1	08/20/22 15:24	08/20/22 15:42	CMK	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1913744	1	08/20/22 21:56	08/22/22 05:25	JDG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM	WG1913755	1	08/20/22 15:00	08/21/22 12:08	JMB	Mt. Juliet, TN

9862-220811-15 L1525184-17 Solid

Collected by Rob Ede
Collected date/time 08/11/22 12:15
Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	27.8	08/11/22 12:15	08/16/22 11:30	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/17/22 10:02	JAS	Mt. Juliet, TN

9862-220811-16 L1525184-18 Solid

Collected by Rob Ede
Collected date/time 08/11/22 12:18
Received date/time 08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Mercury by Method 7471B	WG1912142	1	08/17/22 10:00	08/17/22 12:43	SRT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1915826	5	08/24/22 17:29	08/24/22 21:48	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1915826	50	08/24/22 17:29	08/24/22 22:10	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	275	08/11/22 12:18	08/16/22 15:01	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1914309	22	08/11/22 12:18	08/22/22 04:44	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1916368	22	08/11/22 12:18	08/25/22 18:16	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 21:15	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM	WG1913755	1	08/20/22 15:00	08/21/22 13:00	JMB	Mt. Juliet, TN

SAMPLE SUMMARY

9862-220811-17 L1525184-19 Solid

Collected by
Rob Ede

Collected date/time
08/11/22 12:25

Received date/time
08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911111	1	08/16/22 14:47	08/16/22 15:01	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	26.5	08/11/22 12:25	08/16/22 11:52	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 22:34	JAS	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

9862-220811-19 L1525184-21 Solid

Collected by
Rob Ede

Collected date/time
08/11/22 12:55

Received date/time
08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911113	1	08/17/22 11:37	08/17/22 11:50	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	29	08/11/22 12:55	08/16/22 12:15	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 20:23	JAS	Mt. Juliet, TN

9862-220811-20 L1525184-22 Solid

Collected by
Rob Ede

Collected date/time
08/11/22 13:05

Received date/time
08/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1911113	1	08/17/22 11:37	08/17/22 11:50	CMK	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1911387	29.5	08/11/22 13:05	08/16/22 12:38	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG1911139	1	08/16/22 12:59	08/16/22 20:10	JAS	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Project Manager



Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Mercury,Dissolved	ND		0.200	1	08/15/2022 11:42	WG1910563

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Arsenic,Dissolved	ND		2.00	1	08/17/2022 18:52	WG1911350
Barium,Dissolved	65.0		2.00	1	08/17/2022 18:52	WG1911350
Cadmium,Dissolved	ND		1.00	1	08/17/2022 18:52	WG1911350
Chromium,Dissolved	ND		2.00	1	08/17/2022 18:52	WG1911350
Lead,Dissolved	ND		2.00	1	08/17/2022 18:52	WG1911350
Selenium,Dissolved	ND		2.00	1	08/17/2022 18:52	WG1911350
Silver,Dissolved	ND		2.00	1	08/17/2022 18:52	WG1911350

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Gasoline Range Organics-NWTPH	ND		100	1	08/20/2022 07:44	WG1913331
(S) a,a,a-Trifluorotoluene(FID)	98.9		78.0-120		08/20/2022 07:44	WG1913331

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Acetone	ND	J3 J4	50.0	1	08/18/2022 06:12	WG1912633
Acrolein	ND	C3	50.0	1	08/18/2022 06:12	WG1912633
Acrylonitrile	ND	J4	10.0	1	08/18/2022 06:12	WG1912633
Benzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Bromobenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Bromodichloromethane	ND		1.00	1	08/18/2022 06:12	WG1912633
Bromoform	ND		1.00	1	08/18/2022 06:12	WG1912633
Bromomethane	ND		5.00	1	08/18/2022 06:12	WG1912633
n-Butylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
sec-Butylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
tert-Butylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Carbon tetrachloride	ND		1.00	1	08/18/2022 06:12	WG1912633
Chlorobenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Chlorodibromomethane	ND		1.00	1	08/18/2022 06:12	WG1912633
Chloroethane	ND		5.00	1	08/18/2022 06:12	WG1912633
Chloroform	ND		5.00	1	08/18/2022 06:12	WG1912633
Chloromethane	ND		2.50	1	08/18/2022 06:12	WG1912633
2-Chlorotoluene	ND		1.00	1	08/18/2022 06:12	WG1912633
4-Chlorotoluene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,2-Dibromo-3-Chloropropane	ND		5.00	1	08/18/2022 06:12	WG1912633
1,2-Dibromoethane	ND		1.00	1	08/18/2022 06:12	WG1912633
Dibromomethane	ND		1.00	1	08/18/2022 06:12	WG1912633
1,2-Dichlorobenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,3-Dichlorobenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,4-Dichlorobenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Dichlorodifluoromethane	ND		5.00	1	08/18/2022 06:12	WG1912633
1,1-Dichloroethane	ND		1.00	1	08/18/2022 06:12	WG1912633
1,2-Dichloroethane	ND		1.00	1	08/18/2022 06:12	WG1912633
1,1-Dichloroethene	ND		1.00	1	08/18/2022 06:12	WG1912633
cis-1,2-Dichloroethene	ND		1.00	1	08/18/2022 06:12	WG1912633
trans-1,2-Dichloroethene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,2-Dichloropropane	ND		1.00	1	08/18/2022 06:12	WG1912633

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

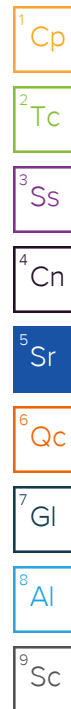
7 Gl

8 Al

9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
1,1-Dichloropropene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,3-Dichloropropane	ND		1.00	1	08/18/2022 06:12	WG1912633
cis-1,3-Dichloropropene	ND		1.00	1	08/18/2022 06:12	WG1912633
trans-1,3-Dichloropropene	ND		1.00	1	08/18/2022 06:12	WG1912633
2,2-Dichloropropane	ND		1.00	1	08/18/2022 06:12	WG1912633
Di-isopropyl ether	ND		1.00	1	08/18/2022 06:12	WG1912633
Ethylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Hexachloro-1,3-butadiene	ND		1.00	1	08/18/2022 06:12	WG1912633
Isopropylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
p-Isopropyltoluene	ND		1.00	1	08/18/2022 06:12	WG1912633
2-Butanone (MEK)	ND		10.0	1	08/18/2022 06:12	WG1912633
Methylene Chloride	ND		5.00	1	08/18/2022 06:12	WG1912633
4-Methyl-2-pentanone (MIBK)	ND		10.0	1	08/18/2022 06:12	WG1912633
Methyl tert-butyl ether	ND		1.00	1	08/18/2022 06:12	WG1912633
Naphthalene	ND		5.00	1	08/18/2022 06:12	WG1912633
n-Propylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Styrene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,1,1,2-Tetrachloroethane	ND		1.00	1	08/18/2022 06:12	WG1912633
1,1,2,2-Tetrachloroethane	ND		1.00	1	08/18/2022 06:12	WG1912633
1,1,2-Trichlorotrifluoroethane	ND		1.00	1	08/18/2022 06:12	WG1912633
Tetrachloroethene	ND		1.00	1	08/18/2022 06:12	WG1912633
Toluene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,2,3-Trichlorobenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,2,4-Trichlorobenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,1,1-Trichloroethane	ND		1.00	1	08/18/2022 06:12	WG1912633
1,1,2-Trichloroethane	ND		1.00	1	08/18/2022 06:12	WG1912633
Trichloroethene	ND		1.00	1	08/18/2022 06:12	WG1912633
Trichlorofluoromethane	ND		5.00	1	08/18/2022 06:12	WG1912633
1,2,3-Trichloropropane	ND		2.50	1	08/18/2022 06:12	WG1912633
1,2,4-Trimethylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,2,3-Trimethylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
1,3,5-Trimethylbenzene	ND		1.00	1	08/18/2022 06:12	WG1912633
Vinyl chloride	ND		1.00	1	08/18/2022 06:12	WG1912633
Xylenes, Total	ND		3.00	1	08/18/2022 06:12	WG1912633
(S) Toluene-d8	111		80.0-120		08/18/2022 06:12	WG1912633
(S) 4-Bromofluorobenzene	104		77.0-126		08/18/2022 06:12	WG1912633
(S) 1,2-Dichloroethane-d4	124		70.0-130		08/18/2022 06:12	WG1912633



Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	ND		100	1	08/18/2022 17:08	WG1912551
Residual Range Organics (RRO)	ND		250	1	08/18/2022 17:08	WG1912551
(S) o-Terphenyl	13.4	J2	31.0-160		08/18/2022 17:08	WG1912551

Sample Narrative:

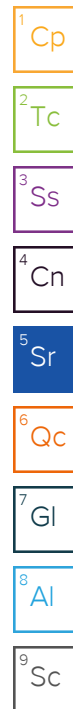
L1525184-01 WG1912551: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix.

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Acenaphthene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Acenaphthylene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Benzo(a)anthracene	ND		0.0500	1	08/16/2022 21:03	WG1911148

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Benzo(a)pyrene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Benzo(b)fluoranthene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Benzo(g,h,i)perylene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Benzo(k)fluoranthene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Chrysene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Dibenz(a,h)anthracene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Fluoranthene	ND		0.100	1	08/16/2022 21:03	WG1911148
Fluorene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Indeno(1,2,3-cd)pyrene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Naphthalene	ND		0.250	1	08/16/2022 21:03	WG1911148
Phenanthrene	ND		0.0500	1	08/16/2022 21:03	WG1911148
Pyrene	ND		0.0500	1	08/16/2022 21:03	WG1911148
1-Methylnaphthalene	ND		0.250	1	08/16/2022 21:03	WG1911148
2-Methylnaphthalene	ND		0.250	1	08/16/2022 21:03	WG1911148
2-Chloronaphthalene	ND		0.250	1	08/16/2022 21:03	WG1911148
(S) Nitrobenzene-d5	95.0		31.0-160		08/16/2022 21:03	WG1911148
(S) 2-Fluorobiphenyl	77.0		48.0-148		08/16/2022 21:03	WG1911148
(S) p-Terphenyl-d14	43.0		37.0-146		08/16/2022 21:03	WG1911148



Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	ND		100	1	08/20/2022 08:06	WG1913331
(S) a,a,a-Trifluorotoluene(FID)	95.5		78.0-120		08/20/2022 08:06	WG1913331

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	ND	J3 J4	50.0	1	08/18/2022 06:32	WG1912633
Acrolein	ND	C3	50.0	1	08/18/2022 06:32	WG1912633
Acrylonitrile	ND	J4	10.0	1	08/18/2022 06:32	WG1912633
Benzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Bromobenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Bromodichloromethane	ND		1.00	1	08/18/2022 06:32	WG1912633
Bromoform	ND		1.00	1	08/18/2022 06:32	WG1912633
Bromomethane	ND		5.00	1	08/18/2022 06:32	WG1912633
n-Butylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
sec-Butylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
tert-Butylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Carbon tetrachloride	ND		1.00	1	08/18/2022 06:32	WG1912633
Chlorobenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Chlorodibromomethane	ND		1.00	1	08/18/2022 06:32	WG1912633
Chloroethane	ND		5.00	1	08/18/2022 06:32	WG1912633
Chloroform	ND		5.00	1	08/18/2022 06:32	WG1912633
Chloromethane	ND		2.50	1	08/18/2022 06:32	WG1912633
2-Chlorotoluene	ND		1.00	1	08/18/2022 06:32	WG1912633
4-Chlorotoluene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,2-Dibromo-3-Chloropropane	ND		5.00	1	08/18/2022 06:32	WG1912633
1,2-Dibromoethane	ND		1.00	1	08/18/2022 06:32	WG1912633
Dibromomethane	ND		1.00	1	08/18/2022 06:32	WG1912633
1,2-Dichlorobenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,3-Dichlorobenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,4-Dichlorobenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Dichlorodifluoromethane	ND		5.00	1	08/18/2022 06:32	WG1912633
1,1-Dichloroethane	ND		1.00	1	08/18/2022 06:32	WG1912633
1,2-Dichloroethane	ND		1.00	1	08/18/2022 06:32	WG1912633
1,1-Dichloroethene	ND		1.00	1	08/18/2022 06:32	WG1912633
cis-1,2-Dichloroethene	ND		1.00	1	08/18/2022 06:32	WG1912633
trans-1,2-Dichloroethene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,2-Dichloropropane	ND		1.00	1	08/18/2022 06:32	WG1912633
1,1-Dichloropropene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,3-Dichloropropane	ND		1.00	1	08/18/2022 06:32	WG1912633
cis-1,3-Dichloropropene	ND		1.00	1	08/18/2022 06:32	WG1912633
trans-1,3-Dichloropropene	ND		1.00	1	08/18/2022 06:32	WG1912633
2,2-Dichloropropane	ND		1.00	1	08/18/2022 06:32	WG1912633
Di-isopropyl ether	ND		1.00	1	08/18/2022 06:32	WG1912633
Ethylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Hexachloro-1,3-butadiene	ND		1.00	1	08/18/2022 06:32	WG1912633
Isopropylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
p-Isopropyltoluene	ND		1.00	1	08/18/2022 06:32	WG1912633
2-Butanone (MEK)	ND		10.0	1	08/18/2022 06:32	WG1912633
Methylene Chloride	ND		5.00	1	08/18/2022 06:32	WG1912633
4-Methyl-2-pentanone (MIBK)	ND		10.0	1	08/18/2022 06:32	WG1912633
Methyl tert-butyl ether	ND		1.00	1	08/18/2022 06:32	WG1912633
Naphthalene	ND		5.00	1	08/18/2022 06:32	WG1912633
n-Propylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Styrene	ND		1.00	1	08/18/2022 06:32	WG1912633

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

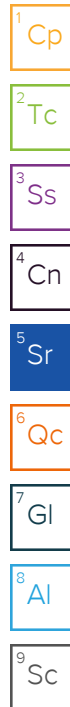
7 Gl

8 Al

9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	ND		1.00	1	08/18/2022 06:32	WG1912633
1,1,2,2-Tetrachloroethane	ND		1.00	1	08/18/2022 06:32	WG1912633
1,1,2-Trichlorotrifluoroethane	ND		1.00	1	08/18/2022 06:32	WG1912633
Tetrachloroethene	ND		1.00	1	08/18/2022 06:32	WG1912633
Toluene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,2,3-Trichlorobenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,2,4-Trichlorobenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,1,1-Trichloroethane	ND		1.00	1	08/18/2022 06:32	WG1912633
1,1,2-Trichloroethane	ND		1.00	1	08/18/2022 06:32	WG1912633
Trichloroethene	ND		1.00	1	08/18/2022 06:32	WG1912633
Trichlorofluoromethane	ND		5.00	1	08/18/2022 06:32	WG1912633
1,2,3-Trichloropropane	ND		2.50	1	08/18/2022 06:32	WG1912633
1,2,4-Trimethylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,2,3-Trimethylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
1,3,5-Trimethylbenzene	ND		1.00	1	08/18/2022 06:32	WG1912633
Vinyl chloride	ND		1.00	1	08/18/2022 06:32	WG1912633
Xylenes, Total	ND		3.00	1	08/18/2022 06:32	WG1912633
(S) Toluene-d8	110		80.0-120		08/18/2022 06:32	WG1912633
(S) 4-Bromofluorobenzene	102		77.0-126		08/18/2022 06:32	WG1912633
(S) 1,2-Dichloroethane-d4	123		70.0-130		08/18/2022 06:32	WG1912633



Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	450		100	1	08/18/2022 17:34	WG1912551
Residual Range Organics (RRO)	ND		250	1	08/18/2022 17:34	WG1912551
(S) o-Terphenyl	19.2	J2	31.0-160		08/18/2022 17:34	WG1912551

Sample Narrative:

L1525184-02 WG1912551: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix.

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Anthracene	ND		0.0500	1	08/16/2022 20:43	WG1911148
Acenaphthene	ND		0.0500	1	08/16/2022 20:43	WG1911148
Acenaphthylene	ND		0.0500	1	08/16/2022 20:43	WG1911148
Benzo(a)anthracene	0.0574		0.0500	1	08/16/2022 20:43	WG1911148
Benzo(a)pyrene	0.0546		0.0500	1	08/16/2022 20:43	WG1911148
Benzo(b)fluoranthene	0.0520		0.0500	1	08/16/2022 20:43	WG1911148
Benzo(g,h,i)perylene	0.0674		0.0500	1	08/16/2022 20:43	WG1911148
Benzo(k)fluoranthene	ND		0.0500	1	08/16/2022 20:43	WG1911148
Chrysene	0.0550		0.0500	1	08/16/2022 20:43	WG1911148
Dibenz(a,h)anthracene	ND		0.0500	1	08/16/2022 20:43	WG1911148
Fluoranthene	0.144		0.100	1	08/16/2022 20:43	WG1911148
Fluorene	ND		0.0500	1	08/16/2022 20:43	WG1911148
Indeno(1,2,3-cd)pyrene	ND		0.0500	1	08/16/2022 20:43	WG1911148
Naphthalene	ND		0.250	1	08/16/2022 20:43	WG1911148
Phenanthrene	0.139		0.0500	1	08/16/2022 20:43	WG1911148
Pyrene	0.167		0.0500	1	08/16/2022 20:43	WG1911148
1-Methylnaphthalene	ND		0.250	1	08/16/2022 20:43	WG1911148
2-Methylnaphthalene	ND		0.250	1	08/16/2022 20:43	WG1911148
2-Chloronaphthalene	ND		0.250	1	08/16/2022 20:43	WG1911148
(S) Nitrobenzene-d5	122		31.0-160		08/16/2022 20:43	WG1911148
(S) 2-Fluorobiphenyl	97.0		48.0-148		08/16/2022 20:43	WG1911148

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
(S) p-Terphenyl-d14	85.5		37.0-146		08/16/2022 20:43	WG1911148

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	85.8		1	08/16/2022 15:01	WG1911111

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	11.8		3.35	25	08/17/2022 21:13	WG1912568
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	104		77.0-120		08/17/2022 21:13	WG1912568

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	11.9		4.66	1	08/16/2022 20:36	WG1911139
Residual Range Organics (RRO)	14.3		11.7	1	08/16/2022 20:36	WG1911139
(S) <i>o</i> -Terphenyl	41.4		18.0-148		08/16/2022 20:36	WG1911139

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Total Solids by Method 2540 G-2011

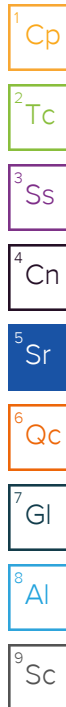
Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	77.4		1	08/16/2022 15:01	WG1911111

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	413		79.1	500	08/17/2022 23:08	WG1912568
(S) a,a,a-Trifluorotoluene(FID)	107		77.0-120		08/17/2022 23:08	WG1912568

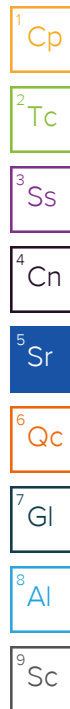
Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Acetone	ND	C3	0.0791	1	08/16/2022 18:07	WG1911531
Acrylonitrile	ND		0.0198	1	08/16/2022 18:07	WG1911531
Benzene	ND		0.00158	1	08/16/2022 18:07	WG1911531
Bromobenzene	ND		0.0198	1	08/16/2022 18:07	WG1911531
Bromodichloromethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
Bromoform	ND		0.0396	1	08/16/2022 18:07	WG1911531
Bromomethane	ND		0.0198	1	08/16/2022 18:07	WG1911531
n-Butylbenzene	ND		0.0198	1	08/16/2022 18:07	WG1911531
sec-Butylbenzene	ND		0.0198	1	08/16/2022 18:07	WG1911531
tert-Butylbenzene	ND	J4	0.00791	1	08/16/2022 18:07	WG1911531
Carbon tetrachloride	ND		0.00791	1	08/16/2022 18:07	WG1911531
Chlorobenzene	ND		0.00396	1	08/16/2022 18:07	WG1911531
Chlorodibromomethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
Chloroethane	ND		0.00791	1	08/16/2022 18:07	WG1911531
Chloroform	ND		0.00396	1	08/16/2022 18:07	WG1911531
Chloromethane	ND		0.0198	1	08/16/2022 18:07	WG1911531
2-Chlorotoluene	ND		0.00396	1	08/16/2022 18:07	WG1911531
4-Chlorotoluene	ND		0.00791	1	08/16/2022 18:07	WG1911531
1,2-Dibromo-3-Chloropropane	ND		0.0396	1	08/16/2022 18:07	WG1911531
1,2-Dibromoethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
Dibromomethane	ND		0.00791	1	08/16/2022 18:07	WG1911531
1,2-Dichlorobenzene	ND		0.00791	1	08/16/2022 18:07	WG1911531
1,3-Dichlorobenzene	ND		0.00791	1	08/16/2022 18:07	WG1911531
1,4-Dichlorobenzene	ND		0.00791	1	08/16/2022 18:07	WG1911531
Dichlorodifluoromethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,1-Dichloroethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,2-Dichloroethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,1-Dichloroethene	ND		0.00396	1	08/16/2022 18:07	WG1911531
cis-1,2-Dichloroethene	ND		0.00396	1	08/16/2022 18:07	WG1911531
trans-1,2-Dichloroethene	ND		0.00791	1	08/16/2022 18:07	WG1911531
1,2-Dichloropropane	ND		0.00791	1	08/16/2022 18:07	WG1911531
1,1-Dichloropropene	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,3-Dichloropropane	ND		0.00791	1	08/16/2022 18:07	WG1911531
cis-1,3-Dichloropropene	ND		0.00396	1	08/16/2022 18:07	WG1911531
trans-1,3-Dichloropropene	ND		0.00791	1	08/16/2022 18:07	WG1911531
2,2-Dichloropropane	ND		0.00396	1	08/16/2022 18:07	WG1911531
Di-isopropyl ether	ND		0.00158	1	08/16/2022 18:07	WG1911531
Ethylbenzene	0.00799		0.00396	1	08/16/2022 18:07	WG1911531
Hexachloro-1,3-butadiene	ND		0.0396	1	08/16/2022 18:07	WG1911531
Isopropylbenzene	ND		0.00396	1	08/16/2022 18:07	WG1911531
p-Isopropyltoluene	0.0190		0.00791	1	08/16/2022 18:07	WG1911531
2-Butanone (MEK)	ND		0.158	1	08/16/2022 18:07	WG1911531
Methylene Chloride	ND		0.0396	1	08/16/2022 18:07	WG1911531
4-Methyl-2-pentanone (MIBK)	0.0777		0.0396	1	08/16/2022 18:07	WG1911531



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Methyl tert-butyl ether	ND		0.00158	1	08/16/2022 18:07	WG1911531
Naphthalene	0.0207	C5	0.0198	1	08/16/2022 18:07	WG1911531
n-Propylbenzene	ND		0.00791	1	08/16/2022 18:07	WG1911531
Styrene	ND		0.0198	1	08/16/2022 18:07	WG1911531
1,1,1,2-Tetrachloroethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,1,2,2-Tetrachloroethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,1,2-Trichlorotrifluoroethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
Tetrachloroethene	ND		0.00396	1	08/16/2022 18:07	WG1911531
Toluene	0.0128		0.00791	1	08/16/2022 18:07	WG1911531
1,2,3-Trichlorobenzene	ND	C4	0.0198	1	08/16/2022 18:07	WG1911531
1,2,4-Trichlorobenzene	ND	C4	0.0198	1	08/16/2022 18:07	WG1911531
1,1,1-Trichloroethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,1,2-Trichloroethane	0.0237		0.00396	1	08/16/2022 18:07	WG1911531
Trichloroethene	ND		0.00158	1	08/16/2022 18:07	WG1911531
Trichlorofluoromethane	ND		0.00396	1	08/16/2022 18:07	WG1911531
1,2,3-Trichloropropane	ND		0.0198	1	08/16/2022 18:07	WG1911531
1,2,4-Trimethylbenzene	0.0256		0.00791	1	08/16/2022 18:07	WG1911531
1,2,3-Trimethylbenzene	ND		0.00791	1	08/16/2022 18:07	WG1911531
1,3,5-Trimethylbenzene	0.0117		0.00791	1	08/16/2022 18:07	WG1911531
Vinyl chloride	ND		0.00396	1	08/16/2022 18:07	WG1911531
Xylenes, Total	0.0340		0.0103	1	08/16/2022 18:07	WG1911531
(S) Toluene-d8	111		75.0-131		08/16/2022 18:07	WG1911531
(S) 4-Bromofluorobenzene	101		67.0-138		08/16/2022 18:07	WG1911531
(S) 1,2-Dichloroethane-d4	92.1		70.0-130		08/16/2022 18:07	WG1911531



Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	9.96		5.17	1	08/16/2022 19:44	WG1911139
Residual Range Organics (RRO)	ND		12.9	1	08/16/2022 19:44	WG1911139
(S) o-Terphenyl	30.4		18.0-148		08/16/2022 19:44	WG1911139

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Acenaphthene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Acenaphthylene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Benzo(a)anthracene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Benzo(a)pyrene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Benzo(b)fluoranthene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Benzo(g,h,i)perylene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Benzo(k)fluoranthene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Chrysene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Dibenz(a,h)anthracene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Fluoranthene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Fluorene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Indeno(1,2,3-cd)pyrene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Naphthalene	0.169		0.0258	1	08/21/2022 10:26	WG1913753
Phenanthrene	ND		0.00775	1	08/21/2022 10:26	WG1913753
Pyrene	ND		0.00775	1	08/21/2022 10:26	WG1913753
1-Methylnaphthalene	0.0519		0.0258	1	08/21/2022 10:26	WG1913753
2-Methylnaphthalene	0.0664		0.0258	1	08/21/2022 10:26	WG1913753
2-Chloronaphthalene	ND		0.0258	1	08/21/2022 10:26	WG1913753
(S) Nitrobenzene-d5	0.000	J2	14.0-149		08/21/2022 10:26	WG1913753

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
(S) 2-Fluorobiphenyl	53.3		34.0-125		08/21/2022 10:26	WG1913753
(S) p-Terphenyl-d14	52.9		23.0-120		08/21/2022 10:26	WG1913753

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	89.4		1	08/16/2022 15:01	WG1911111

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	36.5		3.29	26.8	08/17/2022 21:36	WG1912568
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	105		77.0-120		08/17/2022 21:36	WG1912568

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	30.5		4.47	1	08/16/2022 22:08	WG1911139
Residual Range Organics (RRO)	32.0		11.2	1	08/16/2022 22:08	WG1911139
(S) <i>o</i> -Terphenyl	61.7		18.0-148		08/16/2022 22:08	WG1911139

1
Cp2
Tc3
Ss4
Cn5
Sr6
Qc7
Gl8
Al9
Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	83.3		1	08/16/2022 15:01	WG1911111

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	94.2		3.86	28	08/16/2022 09:58	WG1911387
(S) a,a,a-Trifluorotoluene(FID)	100		77.0-120		08/16/2022 09:58	WG1911387

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	ND		4.80	1	08/16/2022 19:57	WG1911139
Residual Range Organics (RRO)	ND		12.0	1	08/16/2022 19:57	WG1911139
(S) o-Terphenyl	57.7		18.0-148		08/16/2022 19:57	WG1911139

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	88.7		1	08/16/2022 15:01	WG1911111

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	9.47	B	3.55	28.7	08/16/2022 10:21	WG1911387
(S) a,a,a-Trifluorotoluene(FID)	106		77.0-120		08/16/2022 10:21	WG1911387

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	18.8		4.51	1	08/16/2022 20:49	WG1911139
Residual Range Organics (RRO)	23.0		11.3	1	08/16/2022 20:49	WG1911139
(S) o-Terphenyl	55.2		18.0-148		08/16/2022 20:49	WG1911139

1
Cp2
Tc3
Ss4
Cn5
Sr6
Qc7
Gl8
Al9
Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	78.6		1	08/16/2022 15:01	WG1911111

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		3.99	26	08/16/2022 10:44	WG1911387
(S) a,a,a-Trifluorotoluene(FID)	106		77.0-120		08/16/2022 10:44	WG1911387

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		5.09	1	08/17/2022 09:49	WG1911139
Residual Range Organics (RRO)	ND		12.7	1	08/17/2022 09:49	WG1911139
(S) o-Terphenyl	45.3		18.0-148		08/17/2022 09:49	WG1911139

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Acenaphthene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Acenaphthylene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Benzo(a)anthracene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Benzo(a)pyrene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Benzo(b)fluoranthene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Benzo(g,h,i)perylene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Benzo(k)fluoranthene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Chrysene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Dibenz(a,h)anthracene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Fluoranthene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Fluorene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Indeno(1,2,3-cd)pyrene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Naphthalene	ND		0.0254	1	08/21/2022 10:43	WG1913753
Phenanthrene	ND		0.00763	1	08/21/2022 10:43	WG1913753
Pyrene	ND		0.00763	1	08/21/2022 10:43	WG1913753
1-Methylnaphthalene	ND		0.0254	1	08/21/2022 10:43	WG1913753
2-Methylnaphthalene	ND		0.0254	1	08/21/2022 10:43	WG1913753
2-Chloronaphthalene	ND		0.0254	1	08/21/2022 10:43	WG1913753
(S) Nitrobenzene-d5	81.8		14.0-149		08/21/2022 10:43	WG1913753
(S) 2-Fluorobiphenyl	77.3		34.0-125		08/21/2022 10:43	WG1913753
(S) p-Terphenyl-d14	76.4		23.0-120		08/21/2022 10:43	WG1913753

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	79.1		1	08/16/2022 15:01	WG1911111

1
Cp2
Tc

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		4.26	28.5	08/16/2022 11:07	WG1911387
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	106		77.0-120		08/16/2022 11:07	WG1911387

3
Ss4
Cn5
Sr

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		5.05	1	08/17/2022 09:36	WG1911139
Residual Range Organics (RRO)	ND		12.6	1	08/17/2022 09:36	WG1911139
(S) <i>o</i> -Terphenyl	50.5		18.0-148		08/17/2022 09:36	WG1911139

6
Qc7
Gl8
Al9
Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	90.0		1	08/20/2022 15:42	WG1913792

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	27.9		4.45	1	08/22/2022 05:25	WG1913744
Residual Range Organics (RRO)	33.5		11.1	1	08/22/2022 05:25	WG1913744
(S) o-Terphenyl	47.2		18.0-148		08/22/2022 05:25	WG1913744

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Acenaphthene	0.0146		0.00667	1	08/21/2022 12:08	WG1913755
Acenaphthylene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Benzo(a)anthracene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Benzo(a)pyrene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Benzo(b)fluoranthene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Benzo(g,h,i)perylene	0.0123		0.00667	1	08/21/2022 12:08	WG1913755
Benzo(k)fluoranthene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Chrysene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Dibenz(a,h)anthracene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Fluoranthene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Fluorene	0.0179		0.00667	1	08/21/2022 12:08	WG1913755
Indeno(1,2,3-cd)pyrene	ND		0.00667	1	08/21/2022 12:08	WG1913755
Naphthalene	ND		0.0222	1	08/21/2022 12:08	WG1913755
Phenanthrene	0.0258		0.00667	1	08/21/2022 12:08	WG1913755
Pyrene	0.0122		0.00667	1	08/21/2022 12:08	WG1913755
1-Methylnaphthalene	0.0900		0.0222	1	08/21/2022 12:08	WG1913755
2-Methylnaphthalene	0.0978		0.0222	1	08/21/2022 12:08	WG1913755
2-Chloronaphthalene	ND		0.0222	1	08/21/2022 12:08	WG1913755
(S) Nitrobenzene-d5	66.0		14.0-149		08/21/2022 12:08	WG1913755
(S) 2-Fluorobiphenyl	67.7		34.0-125		08/21/2022 12:08	WG1913755
(S) p-Terphenyl-d14	65.8		23.0-120		08/21/2022 12:08	WG1913755

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	80.9		1	08/16/2022 15:01	WG1911111

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	ND		4.03	27.8	08/16/2022 11:30	WG1911387
(S) a,a,a-Trifluorotoluene(FID)	106		77.0-120		08/16/2022 11:30	WG1911387

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	ND		4.95	1	08/17/2022 10:02	WG1911139
Residual Range Organics (RRO)	18.3		12.4	1	08/17/2022 10:02	WG1911139
(S) o-Terphenyl	57.5		18.0-148		08/17/2022 10:02	WG1911139

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	86.6		1	08/16/2022 15:01	WG1911111

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0630		0.0462	1	08/17/2022 12:43	WG1912142

Metals (ICPMS) by Method 6020B

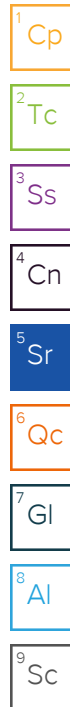
Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	9.71		1.16	5	08/24/2022 21:48	WG1915826
Barium	637		28.9	50	08/24/2022 22:10	WG1915826
Cadmium	ND		1.16	5	08/24/2022 21:48	WG1915826
Chromium	53.5		5.78	5	08/24/2022 21:48	WG1915826
Lead	12.3		2.31	5	08/24/2022 21:48	WG1915826
Selenium	ND		2.89	5	08/24/2022 21:48	WG1915826
Silver	ND		0.578	5	08/24/2022 21:48	WG1915826

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	1660		35.6	275	08/16/2022 15:01	WG1911387
(S) a,a,a-Trifluorotoluene(FID)	103		77.0-120		08/16/2022 15:01	WG1911387

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Acetone	ND		1.42	22	08/22/2022 04:44	WG1914309
Acrylonitrile	ND		0.356	22	08/22/2022 04:44	WG1914309
Benzene	0.0307		0.0285	22	08/22/2022 04:44	WG1914309
Bromobenzene	ND		0.356	22	08/22/2022 04:44	WG1914309
Bromodichloromethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
Bromoform	ND		0.712	22	08/22/2022 04:44	WG1914309
Bromomethane	ND		0.356	22	08/22/2022 04:44	WG1914309
n-Butylbenzene	1.07		0.356	22	08/22/2022 04:44	WG1914309
sec-Butylbenzene	0.723		0.356	22	08/22/2022 04:44	WG1914309
tert-Butylbenzene	ND		0.142	22	08/22/2022 04:44	WG1914309
Carbon tetrachloride	ND		0.142	22	08/22/2022 04:44	WG1914309
Chlorobenzene	ND		0.0712	22	08/22/2022 04:44	WG1914309
Chlorodibromomethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
Chloroethane	ND		0.142	22	08/22/2022 04:44	WG1914309
Chloroform	ND		0.0712	22	08/22/2022 04:44	WG1914309
Chloromethane	ND		0.356	22	08/22/2022 04:44	WG1914309
2-Chlorotoluene	ND		0.0712	22	08/22/2022 04:44	WG1914309
4-Chlorotoluene	ND		0.142	22	08/22/2022 04:44	WG1914309
1,2-Dibromo-3-Chloropropane	ND		0.712	22	08/22/2022 04:44	WG1914309
1,2-Dibromoethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
Dibromomethane	ND		0.142	22	08/22/2022 04:44	WG1914309
1,2-Dichlorobenzene	ND		0.142	22	08/22/2022 04:44	WG1914309
1,3-Dichlorobenzene	ND		0.142	22	08/22/2022 04:44	WG1914309
1,4-Dichlorobenzene	ND		0.142	22	08/22/2022 04:44	WG1914309
Dichlorodifluoromethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
1,1-Dichloroethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
1,2-Dichloroethane	ND		0.0712	22	08/22/2022 04:44	WG1914309



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.0712	22	08/22/2022 04:44	WG1914309
cis-1,2-Dichloroethene	ND		0.0712	22	08/22/2022 04:44	WG1914309
trans-1,2-Dichloroethene	ND		0.142	22	08/22/2022 04:44	WG1914309
1,2-Dichloropropane	ND		0.142	22	08/22/2022 04:44	WG1914309
1,1-Dichloropropene	ND		0.0712	22	08/22/2022 04:44	WG1914309
1,3-Dichloropropane	ND		0.142	22	08/22/2022 04:44	WG1914309
cis-1,3-Dichloropropene	ND		0.0712	22	08/22/2022 04:44	WG1914309
trans-1,3-Dichloropropene	ND		0.142	22	08/22/2022 04:44	WG1914309
2,2-Dichloropropane	ND		0.0712	22	08/22/2022 04:44	WG1914309
Di-isopropyl ether	ND		0.0285	22	08/22/2022 04:44	WG1914309
Ethylbenzene	1.41		0.0712	22	08/22/2022 04:44	WG1914309
Hexachloro-1,3-butadiene	ND		0.712	22	08/22/2022 04:44	WG1914309
Isopropylbenzene	1.12		0.0712	22	08/22/2022 04:44	WG1914309
p-Isopropyltoluene	2.72		0.142	22	08/22/2022 04:44	WG1914309
2-Butanone (MEK)	ND		2.85	22	08/22/2022 04:44	WG1914309
Methylene Chloride	ND		0.712	22	08/22/2022 04:44	WG1914309
4-Methyl-2-pentanone (MIBK)	ND		0.712	22	08/22/2022 04:44	WG1914309
Methyl tert-butyl ether	ND		0.0285	22	08/22/2022 04:44	WG1914309
Naphthalene	1.18		0.356	22	08/22/2022 04:44	WG1914309
n-Propylbenzene	2.06		0.142	22	08/22/2022 04:44	WG1914309
Styrene	ND		0.356	22	08/22/2022 04:44	WG1914309
1,1,1,2-Tetrachloroethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
1,1,2,2-Tetrachloroethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
1,1,2-Trichlorotrifluoroethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
Tetrachloroethene	ND		0.0712	22	08/22/2022 04:44	WG1914309
Toluene	ND		0.142	22	08/25/2022 18:16	WG1916368
1,2,3-Trichlorobenzene	ND		0.356	22	08/22/2022 04:44	WG1914309
1,2,4-Trichlorobenzene	ND		0.356	22	08/22/2022 04:44	WG1914309
1,1,1-Trichloroethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
1,1,2-Trichloroethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
Trichloroethene	ND		0.0285	22	08/22/2022 04:44	WG1914309
Trichlorofluoromethane	ND		0.0712	22	08/22/2022 04:44	WG1914309
1,2,3-Trichloropropane	ND		0.356	22	08/22/2022 04:44	WG1914309
1,2,4-Trimethylbenzene	1.53		0.142	22	08/22/2022 04:44	WG1914309
1,2,3-Trimethylbenzene	0.276		0.142	22	08/22/2022 04:44	WG1914309
1,3,5-Trimethylbenzene	6.05		0.142	22	08/22/2022 04:44	WG1914309
Vinyl chloride	ND		0.0712	22	08/22/2022 04:44	WG1914309
Xylenes, Total	0.465		0.185	22	08/25/2022 18:16	WG1916368
(S) Toluene-d8	108		75.0-131		08/22/2022 04:44	WG1914309
(S) Toluene-d8	101		75.0-131		08/25/2022 18:16	WG1916368
(S) 4-Bromofluorobenzene	115		67.0-138		08/22/2022 04:44	WG1914309
(S) 4-Bromofluorobenzene	111		67.0-138		08/25/2022 18:16	WG1916368
(S) 1,2-Dichloroethane-d4	100		70.0-130		08/22/2022 04:44	WG1914309
(S) 1,2-Dichloroethane-d4	114		70.0-130		08/25/2022 18:16	WG1916368

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	18.0		4.62	1	08/16/2022 21:15	WG1911139
Residual Range Organics (RRO)	16.7		11.6	1	08/16/2022 21:15	WG1911139
(S) o-Terphenyl	50.5		18.0-148		08/16/2022 21:15	WG1911139

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

9862-220811-16

SAMPLE RESULTS - 18

Collected date/time: 08/11/22 12:18

L1525184

Semi Volatile Organic Compounds (GC/MS) by Method 8270E-SIM

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Acenaphthene	0.00740		0.00693	1	08/21/2022 13:00	WG1913755
Acenaphthylene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Benzo(a)anthracene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Benzo(a)pyrene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Benzo(b)fluoranthene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Benzo(g,h,i)perylene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Benzo(k)fluoranthene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Chrysene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Dibenz(a,h)anthracene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Fluoranthene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Fluorene	0.00730		0.00693	1	08/21/2022 13:00	WG1913755
Indeno(1,2,3-cd)pyrene	ND		0.00693	1	08/21/2022 13:00	WG1913755
Naphthalene	0.0860		0.0231	1	08/21/2022 13:00	WG1913755
Phenanthrene	0.0105		0.00693	1	08/21/2022 13:00	WG1913755
Pyrene	ND		0.00693	1	08/21/2022 13:00	WG1913755
1-Methylnaphthalene	0.0743		0.0231	1	08/21/2022 13:00	WG1913755
2-Methylnaphthalene	0.0918		0.0231	1	08/21/2022 13:00	WG1913755
2-Chloronaphthalene	ND		0.0231	1	08/21/2022 13:00	WG1913755
(S) Nitrobenzene-d5	32.7		14.0-149		08/21/2022 13:00	WG1913755
(S) 2-Fluorobiphenyl	59.5		34.0-125		08/21/2022 13:00	WG1913755
(S) p-Terphenyl-d14	54.8		23.0-120		08/21/2022 13:00	WG1913755

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	88.3		1	08/16/2022 15:01	WG1911111

1
Cp2
Tc

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	9.23	B	3.33	26.5	08/16/2022 11:52	WG1911387
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	106		77.0-120		08/16/2022 11:52	WG1911387

3
Ss4
Cn5
Sr

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	33.9		4.53	1	08/16/2022 22:34	WG1911139
Residual Range Organics (RRO)	38.5		11.3	1	08/16/2022 22:34	WG1911139
(S) <i>o</i> -Terphenyl	60.2		18.0-148		08/16/2022 22:34	WG1911139

6
Qc7
Gl8
Al9
Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	79.4		1	08/17/2022 11:50	WG1911113

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	10.2	B	4.30	29	08/16/2022 12:15	WG1911387
(S) a,a,a-Trifluorotoluene(FID)	106		77.0-120		08/16/2022 12:15	WG1911387

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	70.6		5.04	1	08/16/2022 20:23	WG1911139
Residual Range Organics (RRO)	81.5		12.6	1	08/16/2022 20:23	WG1911139
(S) o-Terphenyl	46.4		18.0-148		08/16/2022 20:23	WG1911139

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	83.4		1	08/17/2022 11:50	WG1911113

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	84.8		4.04	29.5	08/16/2022 12:38	WG1911387
(S) o,a,a-Trifluorotoluene(FID)	106		77.0-120		08/16/2022 12:38	WG1911387

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	6.11		4.80	1	08/16/2022 20:10	WG1911139
Residual Range Organics (RRO)	ND		12.0	1	08/16/2022 20:10	WG1911139
(S) o-Terphenyl	57.1		18.0-148		08/16/2022 20:10	WG1911139

1
Cp2
Tc3
Ss4
Cn5
Sr6
Qc7
Gl8
Al9
Sc

Method Blank (MB)

(MB) R3827136-1 08/16/22 15:01

	MB Result	<u>MB Qualifier</u>	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.00300			

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

L1525184-14 Original Sample (OS) • Duplicate (DUP)

(OS) L1525184-14 08/16/22 15:01 • (DUP) R3827136-3 08/16/22 15:01

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	78.6	80.7	1	2.62		10

Laboratory Control Sample (LCS)

(LCS) R3827136-2 08/16/22 15:01

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827607-1 08/17/22 11:50

	MB Result	<u>MB Qualifier</u>	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.00400			

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

L1525231-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1525231-01 08/17/22 11:50 • (DUP) R3827607-3 08/17/22 11:50

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	92.2	92.1	1	0.0508		10

⁷Gl

⁸Al

Laboratory Control Sample (LCS)

(LCS) R3827607-2 08/17/22 11:50

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

⁹Sc

Method Blank (MB)

(MB) R3828899-1 08/20/22 15:42

	MB Result	<u>MB Qualifier</u>	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.00200			

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

L1525184-16 Original Sample (OS) • Duplicate (DUP)

(OS) L1525184-16 08/20/22 15:42 • (DUP) R3828899-3 08/20/22 15:42

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	90.0	88.8	1	1.26		10

Laboratory Control Sample (LCS)

(LCS) R3828899-2 08/20/22 15:42

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3826268-1 08/15/22 10:39

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	ug/l		ug/l	ug/l
Mercury,Dissolved	U		0.100	0.200

Laboratory Control Sample (LCS)

(LCS) R3826268-2 08/15/22 10:42

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	ug/l	ug/l	%	%	
Mercury,Dissolved	3.00	2.65	88.5	80.0-120	

L1524871-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-02 08/15/22 10:46 • (MS) R3826268-3 08/15/22 10:52 • (MSD) R3826268-4 08/15/22 10:54

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Mercury,Dissolved	3.00	ND	2.96	2.90	98.8	96.8	1	75.0-125			2.00	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3827300-1 08/17/22 12:25

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3827300-2 08/17/22 12:28

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Mercury	0.500	0.541	108	80.0-120	

L1525594-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1525594-02 08/17/22 12:30 • (MS) R3827300-3 08/17/22 12:33 • (MSD) R3827300-4 08/17/22 12:35

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.500	0.0550	0.548	0.528	98.6	94.5	1	75.0-125			3.76	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3827593-1 08/17/22 17:01

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Arsenic,Dissolved	U		0.180	2.00
Barium,Dissolved	U		0.381	2.00
Cadmium,Dissolved	U		0.150	1.00
Chromium,Dissolved	U		1.24	2.00
Lead,Dissolved	U		0.849	2.00
Selenium,Dissolved	U		0.300	2.00
Silver,Dissolved	U		0.0700	2.00

Laboratory Control Sample (LCS)

(LCS) R3827593-2 08/17/22 17:04

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic,Dissolved	50.0	47.2	94.3	80.0-120	
Barium,Dissolved	50.0	45.6	91.3	80.0-120	
Cadmium,Dissolved	50.0	48.2	96.4	80.0-120	
Chromium,Dissolved	50.0	48.2	96.4	80.0-120	
Lead,Dissolved	50.0	49.1	98.2	80.0-120	
Selenium,Dissolved	50.0	48.4	96.9	80.0-120	
Silver,Dissolved	50.0	49.9	99.8	80.0-120	

L1523656-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523656-02 08/17/22 17:08 • (MS) R3827593-4 08/17/22 17:14 • (MSD) R3827593-5 08/17/22 17:18

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	50.0	ND	46.6	46.3	93.2	92.5	1	75.0-125			0.747	20
Barium,Dissolved	50.0	83.4	129	130	91.5	93.4	1	75.0-125			0.725	20
Cadmium,Dissolved	50.0	ND	48.6	48.4	96.8	96.4	1	75.0-125			0.374	20
Chromium,Dissolved	50.0	ND	47.7	47.6	95.3	95.1	1	75.0-125			0.194	20
Lead,Dissolved	50.0	ND	48.5	47.7	96.9	95.5	1	75.0-125			1.50	20
Selenium,Dissolved	50.0	ND	48.4	48.2	96.7	96.4	1	75.0-125			0.368	20
Silver,Dissolved	50.0	ND	50.3	51.1	101	102	1	75.0-125			1.58	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3830111-1 08/24/22 21:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	U		0.152	2.50
Cadmium	U		0.0855	1.00
Chromium	U		0.297	5.00
Lead	U		0.0990	2.00
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500

Laboratory Control Sample (LCS)

(LCS) R3830111-2 08/24/22 21:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	92.3	92.3	80.0-120	
Barium	100	94.0	94.0	80.0-120	
Cadmium	100	95.8	95.8	80.0-120	
Chromium	100	94.3	94.3	80.0-120	
Lead	100	94.6	94.6	80.0-120	
Selenium	100	96.2	96.2	80.0-120	
Silver	20.0	19.5	97.5	80.0-120	

L1525768-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1525768-06 08/24/22 21:29 • (MS) R3830111-5 08/24/22 21:39 • (MSD) R3830111-6 08/24/22 21:42

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	119	6.61	102	111	80.3	87.2	5	75.0-125			7.67	20
Barium	119	515	414	344	0.000	0.000	5	75.0-125	E V	E V	18.7	20
Cadmium	119	ND	100	112	82.9	92.7	5	75.0-125			11.1	20
Chromium	119	10.2	103	113	77.8	86.5	5	75.0-125			9.52	20
Lead	119	22.2	202	133	151	93.0	5	75.0-125	J5	J3	41.0	20
Selenium	119	ND	99.4	112	83.0	93.2	5	75.0-125			11.5	20
Silver	23.9	ND	20.3	22.2	85.2	93.0	5	75.0-125			8.70	20

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R3827455-2 08/16/22 07:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Gasoline Range Organics-NWTPH	1.59	J	0.848	2.50
(S) a,a,a-Trifluorotoluene(FID)	106			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3827455-1 08/16/22 06:15

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Gasoline Range Organics-NWTPH	5.50	5.63	102	71.0-124	
(S) a,a,a-Trifluorotoluene(FID)			109	77.0-120	

L1524996-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524996-01 08/16/22 07:39 • (MS) R3827455-3 08/16/22 16:10 • (MSD) R3827455-4 08/16/22 16:33

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Gasoline Range Organics-NWTPH	173	ND	170	152	97.3	86.7	25	50.0-150			11.4	27
(S) a,a,a-Trifluorotoluene(FID)					110	110		77.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3827550-2 08/17/22 17:26

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Gasoline Range Organics-NWTPH	U		0.848	2.50
(S) a,a,a-Trifluorotoluene(FID)	106			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3827550-1 08/17/22 15:48

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Gasoline Range Organics-NWTPH	5.50	4.92	89.5	71.0-124	
(S) a,a,a-Trifluorotoluene(FID)			109	77.0-120	

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R3828666-2 08/20/22 06:27

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Gasoline Range Organics-NWTPH	U		31.6	100
(S) a,a,a-Trifluorotoluene(FID)	95.6			78.0-120

Laboratory Control Sample (LCS)

(LCS) R3828666-1 08/20/22 05:31

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Gasoline Range Organics-NWTPH	5500	5600	102	70.0-124	
(S) a,a,a-Trifluorotoluene(FID)			94.0	78.0-120	

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R3827632-3 08/16/22 08:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromobenzene	U		0.000900	0.0125
Bromodichloromethane	U		0.000725	0.00250
Bromoform	U		0.00117	0.0250
Bromomethane	U		0.00197	0.0125
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloroform	U		0.00103	0.00250
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	U		0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
Dibromomethane	U		0.000750	0.00500
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,1-Dichloroethane	U		0.000491	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,2-Dichloropropane	U		0.00142	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
1,3-Dichloropropane	U		0.000501	0.00500
cis-1,3-Dichloropropene	U		0.000757	0.00250
trans-1,3-Dichloropropene	U		0.00114	0.00500
2,2-Dichloropropane	U		0.00138	0.00250
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	U		0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827632-3 08/16/22 08:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	U		0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
Tetrachloroethene	U		0.000896	0.00250
Toluene	U		0.00130	0.00500
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125
1,1,1-Trichloroethane	U		0.000923	0.00250
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	111			75.0-131
(S) 4-Bromofluorobenzene	94.6			67.0-138
(S) 1,2-Dichloroethane-d4	87.9			70.0-130

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827632-1 08/16/22 07:43 • (LCSD) R3827632-2 08/16/22 08:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.625	0.392	0.371	62.7	59.4	10.0-160			5.50	31
Acrylonitrile	0.625	0.515	0.493	82.4	78.9	45.0-153			4.37	22
Benzene	0.125	0.130	0.121	104	96.8	70.0-123			7.17	20
Bromobenzene	0.125	0.147	0.148	118	118	73.0-121			0.678	20
Bromodichloromethane	0.125	0.137	0.135	110	108	73.0-121			1.47	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827632-1 08/16/22 07:43 • (LCSD) R3827632-2 08/16/22 08:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromoform	0.125	0.130	0.122	104	97.6	64.0-132			6.35	20
Bromomethane	0.125	0.131	0.126	105	101	56.0-147			3.89	20
n-Butylbenzene	0.125	0.138	0.131	110	105	68.0-135			5.20	20
sec-Butylbenzene	0.125	0.155	0.149	124	119	74.0-130			3.95	20
tert-Butylbenzene	0.125	0.182	0.176	146	141	75.0-127	J4	J4	3.35	20
Carbon tetrachloride	0.125	0.158	0.156	126	125	66.0-128			1.27	20
Chlorobenzene	0.125	0.131	0.125	105	100	76.0-128			4.69	20
Chlorodibromomethane	0.125	0.145	0.136	116	109	74.0-127			6.41	20
Chloroethane	0.125	0.124	0.126	99.2	101	61.0-134			1.60	20
Chloroform	0.125	0.130	0.125	104	100	72.0-123			3.92	20
Chloromethane	0.125	0.125	0.112	100	89.6	51.0-138			11.0	20
2-Chlorotoluene	0.125	0.152	0.135	122	108	75.0-124			11.8	20
4-Chlorotoluene	0.125	0.141	0.134	113	107	75.0-124			5.09	20
1,2-Dibromo-3-Chloropropane	0.125	0.129	0.130	103	104	59.0-130			0.772	20
1,2-Dibromoethane	0.125	0.137	0.132	110	106	74.0-128			3.72	20
Dibromomethane	0.125	0.129	0.127	103	102	75.0-122			1.56	20
1,2-Dichlorobenzene	0.125	0.131	0.125	105	100	76.0-124			4.69	20
1,3-Dichlorobenzene	0.125	0.134	0.129	107	103	76.0-125			3.80	20
1,4-Dichlorobenzene	0.125	0.131	0.127	105	102	77.0-121			3.10	20
Dichlorodifluoromethane	0.125	0.132	0.127	106	102	43.0-156			3.86	20
1,1-Dichloroethane	0.125	0.129	0.123	103	98.4	70.0-127			4.76	20
1,2-Dichloroethane	0.125	0.119	0.116	95.2	92.8	65.0-131			2.55	20
1,1-Dichloroethene	0.125	0.142	0.139	114	111	65.0-131			2.14	20
cis-1,2-Dichloroethene	0.125	0.131	0.124	105	99.2	73.0-125			5.49	20
trans-1,2-Dichloroethene	0.125	0.127	0.119	102	95.2	71.0-125			6.50	20
1,2-Dichloropropane	0.125	0.130	0.124	104	99.2	74.0-125			4.72	20
1,1-Dichloropropene	0.125	0.145	0.141	116	113	73.0-125			2.80	20
1,3-Dichloropropane	0.125	0.133	0.131	106	105	80.0-125			1.52	20
cis-1,3-Dichloropropene	0.125	0.140	0.134	112	107	76.0-127			4.38	20
trans-1,3-Dichloropropene	0.125	0.143	0.134	114	107	73.0-127			6.50	20
2,2-Dichloropropane	0.125	0.157	0.147	126	118	59.0-135			6.58	20
Di-isopropyl ether	0.125	0.126	0.121	101	96.8	60.0-136			4.05	20
Ethylbenzene	0.125	0.136	0.126	109	101	74.0-126			7.63	20
Hexachloro-1,3-butadiene	0.125	0.158	0.151	126	121	57.0-150			4.53	20
Isopropylbenzene	0.125	0.136	0.129	109	103	72.0-127			5.28	20
p-Isopropyltoluene	0.125	0.133	0.129	106	103	72.0-133			3.05	20
2-Butanone (MEK)	0.625	0.577	0.561	92.3	89.8	30.0-160			2.81	24
Methylene Chloride	0.125	0.135	0.134	108	107	68.0-123			0.743	20
4-Methyl-2-pentanone (MIBK)	0.625	0.662	0.640	106	102	56.0-143			3.38	20
Methyl tert-butyl ether	0.125	0.133	0.128	106	102	66.0-132			3.83	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827632-1 08/16/22 07:43 • (LCSD) R3827632-2 08/16/22 08:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Naphthalene	0.125	0.152	0.159	122	127	59.0-130			4.50	20
n-Propylbenzene	0.125	0.138	0.136	110	109	74.0-126			1.46	20
Styrene	0.125	0.126	0.121	101	96.8	72.0-127			4.05	20
1,1,1,2-Tetrachloroethane	0.125	0.137	0.132	110	106	74.0-129			3.72	20
1,1,2,2-Tetrachloroethane	0.125	0.143	0.144	114	115	68.0-128			0.697	20
1,1,2-Trichlorotrifluoroethane	0.125	0.151	0.143	121	114	61.0-139			5.44	20
Tetrachloroethene	0.125	0.146	0.142	117	114	70.0-136			2.78	20
Toluene	0.125	0.130	0.125	104	100	75.0-121			3.92	20
1,2,3-Trichlorobenzene	0.125	0.147	0.147	118	118	59.0-139			0.000	20
1,2,4-Trichlorobenzene	0.125	0.128	0.126	102	101	62.0-137			1.57	20
1,1,1-Trichloroethane	0.125	0.151	0.143	121	114	69.0-126			5.44	20
1,1,2-Trichloroethane	0.125	0.144	0.136	115	109	78.0-123			5.71	20
Trichloroethene	0.125	0.137	0.134	110	107	76.0-126			2.21	20
Trichlorofluoromethane	0.125	0.140	0.139	112	111	61.0-142			0.717	20
1,2,3-Trichloropropane	0.125	0.148	0.142	118	114	67.0-129			4.14	20
1,2,4-Trimethylbenzene	0.125	0.135	0.131	108	105	70.0-126			3.01	20
1,2,3-Trimethylbenzene	0.125	0.134	0.129	107	103	74.0-124			3.80	20
1,3,5-Trimethylbenzene	0.125	0.143	0.139	114	111	73.0-127			2.84	20
Vinyl chloride	0.125	0.162	0.157	130	126	63.0-134			3.13	20
Xylenes, Total	0.375	0.401	0.375	107	100	72.0-127			6.70	20
(S) Toluene-d8				108	106	75.0-131				
(S) 4-Bromofluorobenzene				95.8	92.5	67.0-138				
(S) 1,2-Dichloroethane-d4				97.9	101	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3830260-3 08/21/22 22:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0365	0.0500
Acrylonitrile	U		0.00361	0.0125
Benzene	U		0.000467	0.00100
Bromobenzene	U		0.000900	0.0125
Bromodichloromethane	U		0.000725	0.00250
Bromoform	U		0.00117	0.0250
Bromomethane	U		0.00197	0.0125
n-Butylbenzene	U		0.00525	0.0125
sec-Butylbenzene	U		0.00288	0.0125
tert-Butylbenzene	U		0.00195	0.00500
Carbon tetrachloride	U		0.000898	0.00500
Chlorobenzene	U		0.000210	0.00250
Chlorodibromomethane	U		0.000612	0.00250
Chloroethane	U		0.00170	0.00500
Chloroform	U		0.00103	0.00250
Chloromethane	U		0.00435	0.0125
2-Chlorotoluene	0.00165	U	0.000865	0.00250
4-Chlorotoluene	U		0.000450	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00390	0.0250
1,2-Dibromoethane	U		0.000648	0.00250
Dibromomethane	U		0.000750	0.00500
1,2-Dichlorobenzene	U		0.000425	0.00500
1,3-Dichlorobenzene	U		0.000600	0.00500
1,4-Dichlorobenzene	U		0.000700	0.00500
Dichlorodifluoromethane	U		0.00161	0.00250
1,1-Dichloroethane	U		0.000491	0.00250
1,2-Dichloroethane	U		0.000649	0.00250
1,1-Dichloroethene	U		0.000606	0.00250
cis-1,2-Dichloroethene	U		0.000734	0.00250
trans-1,2-Dichloroethene	U		0.00104	0.00500
1,2-Dichloropropane	U		0.00142	0.00500
1,1-Dichloropropene	U		0.000809	0.00250
1,3-Dichloropropane	U		0.000501	0.00500
cis-1,3-Dichloropropene	U		0.000757	0.00250
trans-1,3-Dichloropropene	U		0.00114	0.00500
2,2-Dichloropropane	U		0.00138	0.00250
Di-isopropyl ether	U		0.000410	0.00100
Ethylbenzene	0.00247	U	0.000737	0.00250
Hexachloro-1,3-butadiene	U		0.00600	0.0250
Isopropylbenzene	U		0.000425	0.00250

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3830260-3 08/21/22 22:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00255	0.00500
2-Butanone (MEK)	U		0.0635	0.100
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.00228	0.0250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
n-Propylbenzene	U		0.000950	0.00500
Styrene	U		0.000229	0.0125
1,1,1,2-Tetrachloroethane	U		0.000948	0.00250
1,1,2,2-Tetrachloroethane	U		0.000695	0.00250
1,1,2-Trichlorotrifluoroethane	U		0.000754	0.00250
Tetrachloroethene	U		0.000896	0.00250
1,2,3-Trichlorobenzene	U		0.00733	0.0125
1,2,4-Trichlorobenzene	U		0.00440	0.0125
1,1,1-Trichloroethane	U		0.000923	0.00250
1,1,2-Trichloroethane	U		0.000597	0.00250
Trichloroethene	U		0.000584	0.00100
Trichlorofluoromethane	U		0.000827	0.00250
1,2,3-Trichloropropane	U		0.00162	0.0125
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,2,3-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Vinyl chloride	U		0.00116	0.00250
(S) Toluene-d8	103			75.0-131
(S) 4-Bromofluorobenzene	99.2			67.0-138
(S) 1,2-Dichloroethane-d4	102			70.0-130

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3830260-1 08/21/22 21:07 • (LCSD) R3830260-2 08/21/22 21:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.625	0.814	0.815	130	130	10.0-160			0.123	31
Acrylonitrile	0.625	0.615	0.599	98.4	95.8	45.0-153			2.64	22
Benzene	0.125	0.138	0.130	110	104	70.0-123			5.97	20
Bromobenzene	0.125	0.131	0.129	105	103	73.0-121			1.54	20
Bromodichloromethane	0.125	0.128	0.128	102	102	73.0-121			0.000	20
Bromoform	0.125	0.113	0.111	90.4	88.8	64.0-132			1.79	20
Bromomethane	0.125	0.137	0.135	110	108	56.0-147			1.47	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3830260-1 08/21/22 21:07 • (LCSD) R3830260-2 08/21/22 21:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
n-Butylbenzene	0.125	0.133	0.132	106	106	68.0-135			0.755	20
sec-Butylbenzene	0.125	0.130	0.124	104	99.2	74.0-130			4.72	20
tert-Butylbenzene	0.125	0.129	0.127	103	102	75.0-127			1.56	20
Carbon tetrachloride	0.125	0.149	0.139	119	111	66.0-128			6.94	20
Chlorobenzene	0.125	0.126	0.121	101	96.8	76.0-128			4.05	20
Chlorodibromomethane	0.125	0.120	0.118	96.0	94.4	74.0-127			1.68	20
Chloroethane	0.125	0.152	0.152	122	122	61.0-134			0.000	20
Chloroform	0.125	0.134	0.127	107	102	72.0-123			5.36	20
Chloromethane	0.125	0.146	0.152	117	122	51.0-138			4.03	20
2-Chlorotoluene	0.125	0.132	0.127	106	102	75.0-124			3.86	20
4-Chlorotoluene	0.125	0.134	0.128	107	102	75.0-124			4.58	20
1,2-Dibromo-3-Chloropropane	0.125	0.118	0.116	94.4	92.8	59.0-130			1.71	20
1,2-Dibromoethane	0.125	0.136	0.130	109	104	74.0-128			4.51	20
Dibromomethane	0.125	0.143	0.134	114	107	75.0-122			6.50	20
1,2-Dichlorobenzene	0.125	0.138	0.134	110	107	76.0-124			2.94	20
1,3-Dichlorobenzene	0.125	0.130	0.124	104	99.2	76.0-125			4.72	20
1,4-Dichlorobenzene	0.125	0.130	0.124	104	99.2	77.0-121			4.72	20
Dichlorodifluoromethane	0.125	0.144	0.144	115	115	43.0-156			0.000	20
1,1-Dichloroethane	0.125	0.140	0.139	112	111	70.0-127			0.717	20
1,2-Dichloroethane	0.125	0.146	0.146	117	117	65.0-131			0.000	20
1,1-Dichloroethene	0.125	0.133	0.131	106	105	65.0-131			1.52	20
cis-1,2-Dichloroethene	0.125	0.133	0.124	106	99.2	73.0-125			7.00	20
trans-1,2-Dichloroethene	0.125	0.126	0.123	101	98.4	71.0-125			2.41	20
1,2-Dichloropropane	0.125	0.136	0.126	109	101	74.0-125			7.63	20
1,1-Dichloropropene	0.125	0.147	0.135	118	108	73.0-125			8.51	20
1,3-Dichloropropane	0.125	0.129	0.127	103	102	80.0-125			1.56	20
cis-1,3-Dichloropropene	0.125	0.127	0.125	102	100	76.0-127			1.59	20
trans-1,3-Dichloropropene	0.125	0.130	0.127	104	102	73.0-127			2.33	20
2,2-Dichloropropane	0.125	0.154	0.139	123	111	59.0-135			10.2	20
Di-isopropyl ether	0.125	0.143	0.139	114	111	60.0-136			2.84	20
Ethylbenzene	0.125	0.132	0.123	106	98.4	74.0-126			7.06	20
Hexachloro-1,3-butadiene	0.125	0.124	0.127	99.2	102	57.0-150			2.39	20
Isopropylbenzene	0.125	0.130	0.125	104	100	72.0-127			3.92	20
p-Isopropyltoluene	0.125	0.133	0.130	106	104	72.0-133			2.28	20
2-Butanone (MEK)	0.625	0.736	0.707	118	113	30.0-160			4.02	24
Methylene Chloride	0.125	0.131	0.132	105	106	68.0-123			0.760	20
4-Methyl-2-pentanone (MIBK)	0.625	0.676	0.666	108	107	56.0-143			1.49	20
Methyl tert-butyl ether	0.125	0.135	0.127	108	102	66.0-132			6.11	20
Naphthalene	0.125	0.110	0.114	88.0	91.2	59.0-130			3.57	20
n-Propylbenzene	0.125	0.131	0.124	105	99.2	74.0-126			5.49	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3830260-1 08/21/22 21:07 • (LCSD) R3830260-2 08/21/22 21:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Styrene	0.125	0.125	0.123	100	98.4	72.0-127			1.61	20
1,1,1,2-Tetrachloroethane	0.125	0.138	0.128	110	102	74.0-129			7.52	20
1,1,2,2-Tetrachloroethane	0.125	0.121	0.116	96.8	92.8	68.0-128			4.22	20
1,1,2-Trichlorotrifluoroethane	0.125	0.139	0.134	111	107	61.0-139			3.66	20
Tetrachloroethene	0.125	0.142	0.135	114	108	70.0-136			5.05	20
1,2,3-Trichlorobenzene	0.125	0.119	0.121	95.2	96.8	59.0-139			1.67	20
1,2,4-Trichlorobenzene	0.125	0.118	0.123	94.4	98.4	62.0-137			4.15	20
1,1,1-Trichloroethane	0.125	0.149	0.128	119	102	69.0-126			15.2	20
1,1,2-Trichloroethane	0.125	0.119	0.119	95.2	95.2	78.0-123			0.000	20
Trichloroethene	0.125	0.138	0.134	110	107	76.0-126			2.94	20
Trichlorofluoromethane	0.125	0.145	0.130	116	104	61.0-142			10.9	20
1,2,3-Trichloropropane	0.125	0.132	0.132	106	106	67.0-129			0.000	20
1,2,4-Trimethylbenzene	0.125	0.126	0.124	101	99.2	70.0-126			1.60	20
1,2,3-Trimethylbenzene	0.125	0.130	0.123	104	98.4	74.0-124			5.53	20
1,3,5-Trimethylbenzene	0.125	0.130	0.126	104	101	73.0-127			3.12	20
Vinyl chloride	0.125	0.142	0.151	114	121	63.0-134			6.14	20
(S) Toluene-d8				103	101	75.0-131				
(S) 4-Bromofluorobenzene				99.1	101	67.0-138				
(S) 1,2-Dichloroethane-d4				106	108	70.0-130				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3830721-3 08/25/22 11:18

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Toluene	U		0.00130	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	102			75.0-131
(S) 4-Bromofluorobenzene	108			67.0-138
(S) 1,2-Dichloroethane-d4	108			70.0-130

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3830721-1 08/25/22 10:22 • (LCSD) R3830721-2 08/25/22 10:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Toluene	0.125	0.128	0.139	102	111	75.0-121			8.24	20
Xylenes, Total	0.375	0.384	0.421	102	112	72.0-127			9.19	20
(S) Toluene-d8				103	103	75.0-131				
(S) 4-Bromofluorobenzene				99.9	106	67.0-138				
(S) 1,2-Dichloroethane-d4				109	115	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3827812-3 08/17/22 22:46

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Acetone	U		11.3	50.0
Acrolein	U		2.54	50.0
Acrylonitrile	U		0.671	10.0
Benzene	U		0.0941	1.00
Bromobenzene	U		0.118	1.00
Bromodichloromethane	U		0.136	1.00
Bromoform	U		0.129	1.00
Bromomethane	U		0.605	5.00
n-Butylbenzene	U		0.157	1.00
sec-Butylbenzene	U		0.125	1.00
tert-Butylbenzene	U		0.127	1.00
Carbon tetrachloride	U		0.128	1.00
Chlorobenzene	U		0.116	1.00
Chlorodibromomethane	U		0.140	1.00
Chloroethane	U		0.192	5.00
Chloroform	U		0.111	5.00
Chloromethane	U		0.960	2.50
2-Chlorotoluene	U		0.106	1.00
4-Chlorotoluene	U		0.114	1.00
1,2-Dibromo-3-Chloropropane	U		0.276	5.00
1,2-Dibromoethane	U		0.126	1.00
Dibromomethane	U		0.122	1.00
1,2-Dichlorobenzene	U		0.107	1.00
1,3-Dichlorobenzene	U		0.110	1.00
1,4-Dichlorobenzene	U		0.120	1.00
Dichlorodifluoromethane	U		0.374	5.00
1,1-Dichloroethane	U		0.100	1.00
1,2-Dichloroethane	U		0.0819	1.00
1,1-Dichloroethene	U		0.188	1.00
cis-1,2-Dichloroethene	U		0.126	1.00
trans-1,2-Dichloroethene	U		0.149	1.00
1,2-Dichloropropane	U		0.149	1.00
1,1-Dichloropropene	U		0.142	1.00
1,3-Dichloropropane	U		0.110	1.00
cis-1,3-Dichloropropene	U		0.111	1.00
trans-1,3-Dichloropropene	U		0.118	1.00
2,2-Dichloropropane	U		0.161	1.00
Di-isopropyl ether	U		0.105	1.00
Ethylbenzene	U		0.137	1.00
Hexachloro-1,3-butadiene	U		0.337	1.00

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827812-3 08/17/22 22:46

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Isopropylbenzene	U		0.105	1.00
p-Isopropyltoluene	U		0.120	1.00
2-Butanone (MEK)	U		1.19	10.0
Methylene Chloride	U		0.430	5.00
4-Methyl-2-pentanone (MIBK)	U		0.478	10.0
Methyl tert-butyl ether	U		0.101	1.00
Naphthalene	U		1.00	5.00
n-Propylbenzene	U		0.0993	1.00
Styrene	U		0.118	1.00
1,1,1,2-Tetrachloroethane	U		0.147	1.00
1,1,2,2-Tetrachloroethane	U		0.133	1.00
1,1,2-Trichlorotrifluoroethane	U		0.180	1.00
Tetrachloroethene	U		0.300	1.00
Toluene	U		0.278	1.00
1,2,3-Trichlorobenzene	U		0.230	1.00
1,2,4-Trichlorobenzene	U		0.481	1.00
1,1,1-Trichloroethane	U		0.149	1.00
1,1,2-Trichloroethane	U		0.158	1.00
Trichloroethene	U		0.190	1.00
Trichlorofluoromethane	U		0.160	5.00
1,2,3-Trichloropropane	U		0.237	2.50
1,2,4-Trimethylbenzene	U		0.322	1.00
1,2,3-Trimethylbenzene	U		0.104	1.00
1,3,5-Trimethylbenzene	U		0.104	1.00
Vinyl chloride	U		0.234	1.00
Xylenes, Total	U		0.174	3.00
(S) Toluene-d8	114			80.0-120
(S) 4-Bromofluorobenzene	102			77.0-126
(S) 1,2-Dichloroethane-d4	109			70.0-130

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827812-1 08/17/22 21:29 • (LCSD) R3827812-2 08/17/22 21:48

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	44.4	63.2	178	253	19.0-160	J4	J3 J4	34.9	27
Acrolein	25.0	13.2	13.6	52.8	54.4	10.0-160			2.99	26
Acrylonitrile	25.0	35.6	40.1	142	160	55.0-149		J4	11.9	20
Benzene	5.00	5.23	5.34	105	107	70.0-123			2.08	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827812-1 08/17/22 21:29 • (LCSD) R3827812-2 08/17/22 21:48

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Bromobenzene	5.00	5.55	5.17	111	103	73.0-121			7.09	20
Bromodichloromethane	5.00	4.72	4.95	94.4	99.0	75.0-120			4.76	20
Bromoform	5.00	4.24	4.42	84.8	88.4	68.0-132			4.16	20
Bromomethane	5.00	4.31	4.44	86.2	88.8	10.0-160			2.97	25
n-Butylbenzene	5.00	5.06	5.30	101	106	73.0-125			4.63	20
sec-Butylbenzene	5.00	5.20	5.09	104	102	75.0-125			2.14	20
tert-Butylbenzene	5.00	5.19	4.97	104	99.4	76.0-124			4.33	20
Carbon tetrachloride	5.00	5.17	5.07	103	101	68.0-126			1.95	20
Chlorobenzene	5.00	4.87	4.85	97.4	97.0	80.0-121			0.412	20
Chlorodibromomethane	5.00	4.58	4.60	91.6	92.0	77.0-125			0.436	20
Chloroethane	5.00	4.90	5.06	98.0	101	47.0-150			3.21	20
Chloroform	5.00	4.75	4.89	95.0	97.8	73.0-120			2.90	20
Chloromethane	5.00	5.61	5.56	112	111	41.0-142			0.895	20
2-Chlorotoluene	5.00	5.47	5.20	109	104	76.0-123			5.06	20
4-Chlorotoluene	5.00	5.35	5.20	107	104	75.0-122			2.84	20
1,2-Dibromo-3-Chloropropane	5.00	4.69	5.46	93.8	109	58.0-134			15.2	20
1,2-Dibromoethane	5.00	4.87	4.78	97.4	95.6	80.0-122			1.87	20
Dibromomethane	5.00	5.13	5.23	103	105	80.0-120			1.93	20
1,2-Dichlorobenzene	5.00	5.12	5.35	102	107	79.0-121			4.39	20
1,3-Dichlorobenzene	5.00	5.02	5.07	100	101	79.0-120			0.991	20
1,4-Dichlorobenzene	5.00	5.26	5.17	105	103	79.0-120			1.73	20
Dichlorodifluoromethane	5.00	4.27	4.33	85.4	86.6	51.0-149			1.40	20
1,1-Dichloroethane	5.00	5.37	5.57	107	111	70.0-126			3.66	20
1,2-Dichloroethane	5.00	5.18	5.16	104	103	70.0-128			0.387	20
1,1-Dichloroethene	5.00	4.92	4.96	98.4	99.2	71.0-124			0.810	20
cis-1,2-Dichloroethene	5.00	5.13	5.01	103	100	73.0-120			2.37	20
trans-1,2-Dichloroethene	5.00	4.87	4.91	97.4	98.2	73.0-120			0.818	20
1,2-Dichloropropane	5.00	5.63	5.56	113	111	77.0-125			1.25	20
1,1-Dichloropropene	5.00	5.00	5.16	100	103	74.0-126			3.15	20
1,3-Dichloropropane	5.00	5.36	5.36	107	107	80.0-120			0.000	20
cis-1,3-Dichloropropene	5.00	5.11	5.02	102	100	80.0-123			1.78	20
trans-1,3-Dichloropropene	5.00	5.03	4.92	101	98.4	78.0-124			2.21	20
2,2-Dichloropropane	5.00	5.33	5.02	107	100	58.0-130			5.99	20
Di-isopropyl ether	5.00	6.37	6.41	127	128	58.0-138			0.626	20
Ethylbenzene	5.00	4.95	4.89	99.0	97.8	79.0-123			1.22	20
Hexachloro-1,3-butadiene	5.00	4.57	5.31	91.4	106	54.0-138			15.0	20
Isopropylbenzene	5.00	4.92	4.98	98.4	99.6	76.0-127			1.21	20
p-Isopropyltoluene	5.00	5.04	5.00	101	100	76.0-125			0.797	20
2-Butanone (MEK)	25.0	34.4	39.3	138	157	44.0-160			13.3	20
Methylene Chloride	5.00	5.16	5.17	103	103	67.0-120			0.194	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827812-1 08/17/22 21:29 • (LCSD) R3827812-2 08/17/22 21:48

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
4-Methyl-2-pentanone (MIBK)	25.0	33.9	35.0	136	140	68.0-142			3.19	20
Methyl tert-butyl ether	5.00	5.71	5.47	114	109	68.0-125			4.29	20
Naphthalene	5.00	4.58	5.11	91.6	102	54.0-135			10.9	20
n-Propylbenzene	5.00	5.56	5.24	111	105	77.0-124			5.93	20
Styrene	5.00	4.68	4.90	93.6	98.0	73.0-130			4.59	20
1,1,1,2-Tetrachloroethane	5.00	4.78	4.69	95.6	93.8	75.0-125			1.90	20
1,1,2,2-Tetrachloroethane	5.00	5.57	4.85	111	97.0	65.0-130			13.8	20
1,1,2-Trichlorotrifluoroethane	5.00	4.63	4.75	92.6	95.0	69.0-132			2.56	20
Tetrachloroethene	5.00	4.60	4.66	92.0	93.2	72.0-132			1.30	20
Toluene	5.00	5.27	5.29	105	106	79.0-120			0.379	20
1,2,3-Trichlorobenzene	5.00	4.59	5.30	91.8	106	50.0-138			14.4	20
1,2,4-Trichlorobenzene	5.00	4.34	5.12	86.8	102	57.0-137			16.5	20
1,1,1-Trichloroethane	5.00	5.14	4.97	103	99.4	73.0-124			3.36	20
1,1,2-Trichloroethane	5.00	5.00	4.99	100	99.8	80.0-120			0.200	20
Trichloroethene	5.00	4.92	5.24	98.4	105	78.0-124			6.30	20
Trichlorofluoromethane	5.00	4.44	4.55	88.8	91.0	59.0-147			2.45	20
1,2,3-Trichloropropane	5.00	5.46	5.52	109	110	73.0-130			1.09	20
1,2,4-Trimethylbenzene	5.00	5.19	4.99	104	99.8	76.0-121			3.93	20
1,2,3-Trimethylbenzene	5.00	5.17	5.16	103	103	77.0-120			0.194	20
1,3,5-Trimethylbenzene	5.00	5.36	5.09	107	102	76.0-122			5.17	20
Vinyl chloride	5.00	5.03	5.35	101	107	67.0-131			6.17	20
Xylenes, Total	15.0	14.7	14.8	98.0	98.7	79.0-123			0.678	20
(S) Toluene-d8				111	108	80.0-120				
(S) 4-Bromofluorobenzene				98.8	104	77.0-126				
(S) 1,2-Dichloroethane-d4				113	112	70.0-130				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1524730-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524730-02 08/18/22 02:21 • (MS) R3827812-4 08/18/22 07:29 • (MSD) R3827812-5 08/18/22 07:49

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Acetone	25.0	ND	100	74.0	400	296	1	10.0-160	J5	J5	29.9	35
Acrolein	25.0	ND	ND	ND	102	99.6	1	10.0-160			2.38	39
Acrylonitrile	25.0	ND	35.9	19.1	144	76.4	1	21.0-160		J3	61.1	32
Benzene	5.00	9.50	16.9	16.5	148	140	1	17.0-158			2.40	27
Bromobenzene	5.00	ND	6.07	6.43	121	129	1	30.0-149			5.76	28
Bromodichloromethane	5.00	ND	4.47	4.15	89.4	83.0	1	31.0-150			7.42	27
Bromoform	5.00	ND	3.81	3.31	76.2	66.2	1	29.0-150			14.0	29
Bromomethane	5.00	ND	ND	ND	69.4	80.2	1	10.0-160			14.4	38

L1524730-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524730-02 08/18/22 02:21 • (MS) R3827812-4 08/18/22 07:29 • (MSD) R3827812-5 08/18/22 07:49

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
n-Butylbenzene	5.00	ND	5.24	5.37	100	103	1	31.0-150			2.45	30
sec-Butylbenzene	5.00	1.02	6.05	6.77	101	115	1	33.0-155			11.2	29
tert-Butylbenzene	5.00	ND	5.21	5.53	94.2	101	1	34.0-153			5.96	28
Carbon tetrachloride	5.00	ND	4.40	4.84	88.0	96.8	1	23.0-159			9.52	28
Chlorobenzene	5.00	ND	3.97	3.98	79.4	79.6	1	33.0-152			0.252	27
Chlorodibromomethane	5.00	ND	3.94	3.67	78.8	73.4	1	37.0-149			7.10	27
Chloroethane	5.00	ND	5.29	5.62	106	112	1	10.0-160			6.05	30
Chloroform	5.00	ND	5.05	5.21	101	104	1	29.0-154			3.12	28
Chloromethane	5.00	ND	4.88	5.19	97.6	104	1	10.0-160			6.16	29
2-Chlorotoluene	5.00	ND	4.88	5.11	97.6	102	1	32.0-153			4.60	28
4-Chlorotoluene	5.00	ND	4.54	5.00	90.8	100	1	32.0-150			9.64	28
1,2-Dibromo-3-Chloropropane	5.00	ND	5.12	ND	102	80.0	1	22.0-151			24.6	34
1,2-Dibromoethane	5.00	ND	3.96	3.42	79.2	68.4	1	34.0-147			14.6	27
Dibromomethane	5.00	ND	4.76	3.90	95.2	78.0	1	30.0-151			19.9	27
1,2-Dichlorobenzene	5.00	ND	4.80	4.57	96.0	91.4	1	34.0-149			4.91	28
1,3-Dichlorobenzene	5.00	ND	4.72	4.92	94.4	98.4	1	36.0-146			4.15	27
1,4-Dichlorobenzene	5.00	ND	4.60	4.56	92.0	91.2	1	35.0-142			0.873	27
Dichlorodifluoromethane	5.00	ND	ND	ND	79.2	82.6	1	10.0-160			4.20	29
1,1-Dichloroethane	5.00	ND	4.97	4.90	99.4	98.0	1	25.0-158			1.42	27
1,2-Dichloroethane	5.00	15.6	20.9	17.9	106	46.0	1	29.0-151			15.5	27
1,1-Dichloroethene	5.00	ND	3.86	4.44	77.2	88.8	1	11.0-160			14.0	29
cis-1,2-Dichloroethene	5.00	ND	4.73	4.68	94.6	93.6	1	10.0-160			1.06	27
trans-1,2-Dichloroethene	5.00	ND	3.95	4.12	79.0	82.4	1	17.0-153			4.21	27
1,2-Dichloropropane	5.00	ND	6.63	6.29	133	126	1	30.0-156			5.26	27
1,1-Dichloropropene	5.00	ND	4.34	4.66	86.8	93.2	1	25.0-158			7.11	27
1,3-Dichloropropane	5.00	ND	4.50	4.24	90.0	84.8	1	38.0-147			5.95	27
cis-1,3-Dichloropropene	5.00	ND	4.27	3.97	85.4	79.4	1	34.0-149			7.28	28
trans-1,3-Dichloropropene	5.00	ND	4.36	4.06	87.2	81.2	1	32.0-149			7.13	28
2,2-Dichloropropane	5.00	ND	4.60	4.87	92.0	97.4	1	24.0-152			5.70	29
Di-isopropyl ether	5.00	ND	6.31	6.27	126	125	1	21.0-160			0.636	28
Ethylbenzene	5.00	51.1	69.0	72.1	358	420	1	30.0-155	V	V	4.39	27
Hexachloro-1,3-butadiene	5.00	ND	4.81	4.97	96.2	99.4	1	20.0-154			3.27	34
Isopropylbenzene	5.00	6.58	12.5	13.0	118	128	1	28.0-157			3.92	27
p-Isopropyltoluene	5.00	ND	6.06	6.38	121	128	1	30.0-154			5.14	29
2-Butanone (MEK)	25.0	ND	39.4	22.8	158	91.2	1	10.0-160		J3	53.4	32
Methylene Chloride	5.00	ND	ND	ND	83.2	79.4	1	23.0-144			4.67	28
4-Methyl-2-pentanone (MIBK)	25.0	ND	36.9	29.3	148	117	1	29.0-160			23.0	29
Methyl tert-butyl ether	5.00	ND	4.75	3.94	95.0	78.8	1	28.0-150			18.6	29
Naphthalene	5.00	ND	ND	ND	97.6	95.8	1	12.0-156			1.86	35
n-Propylbenzene	5.00	7.91	16.0	18.1	162	204	1	31.0-154	J5	J5	12.3	28

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1524730-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524730-02 08/18/22 02:21 • (MS) R3827812-4 08/18/22 07:29 • (MSD) R3827812-5 08/18/22 07:49

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Styrene	5.00	ND	4.04	3.89	80.8	77.8	1	33.0-155			3.78	28
1,1,1,2-Tetrachloroethane	5.00	ND	4.06	3.71	81.2	74.2	1	36.0-151			9.01	29
1,1,2,2-Tetrachloroethane	5.00	ND	6.25	5.77	125	115	1	33.0-150			7.99	28
1,1,2-Trichlorotrifluoroethane	5.00	ND	4.14	4.45	82.8	89.0	1	23.0-160			7.22	30
Tetrachloroethene	5.00	ND	3.70	4.17	74.0	83.4	1	10.0-160			11.9	27
Toluene	5.00	ND	4.59	4.80	84.0	88.2	1	26.0-154			4.47	28
1,2,3-Trichlorobenzene	5.00	ND	4.66	4.80	93.2	96.0	1	17.0-150			2.96	36
1,2,4-Trichlorobenzene	5.00	ND	4.81	4.36	96.2	87.2	1	24.0-150			9.81	33
1,1,1-Trichloroethane	5.00	ND	4.30	4.58	86.0	91.6	1	23.0-160			6.31	28
1,1,2-Trichloroethane	5.00	ND	6.70	7.00	134	140	1	35.0-147			4.38	27
Trichloroethene	5.00	ND	4.18	3.81	83.6	76.2	1	10.0-160			9.26	25
Trichlorofluoromethane	5.00	ND	ND	ND	79.4	90.4	1	17.0-160			13.0	31
1,2,3-Trichloropropane	5.00	ND	4.68	4.73	93.6	94.6	1	34.0-151			1.06	29
1,2,4-Trimethylbenzene	5.00	5.99	14.2	14.9	164	178	1	26.0-154	J5	J5	4.81	27
1,2,3-Trimethylbenzene	5.00	2.06	6.92	7.11	97.2	101	1	32.0-149			2.71	28
1,3,5-Trimethylbenzene	5.00	ND	4.97	5.28	93.7	99.9	1	28.0-153			6.05	27
Vinyl chloride	5.00	ND	4.72	5.26	94.4	105	1	10.0-160			10.8	27
Xylenes, Total	15.0	ND	13.1	13.8	80.0	84.7	1	29.0-154			5.20	28
(S) Toluene-d8					98.5	97.6	80.0-120					
(S) 4-Bromofluorobenzene					95.6	89.3	77.0-126					
(S) 1,2-Dichloroethane-d4					130	104	70.0-130					

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827073-1 08/16/22 18:25

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Diesel Range Organics (DRO)	U		1.33	4.00
Residual Range Organics (RRO)	U		3.33	10.0
(S) o-Terphenyl	68.9			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3827073-2 08/16/22 18:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Diesel Range Organics (DRO)	50.0	37.4	74.8	50.0-150	
(S) o-Terphenyl			91.9	18.0-148	

L1525184-18 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1525184-18 08/16/22 21:15 • (MS) R3827073-3 08/16/22 21:28 • (MSD) R3827073-4 08/16/22 21:42

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Diesel Range Organics (DRO)	54.3	18.0	62.8	59.9	82.6	76.3	1	50.0-150			4.70	20
(S) o-Terphenyl					70.4	68.9		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3828931-1 08/22/22 02:48

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Diesel Range Organics (DRO)	U		1.33	4.00
Residual Range Organics (RRO)	U		3.33	10.0
(S) o-Terphenyl	85.3			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3828931-2 08/22/22 03:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Diesel Range Organics (DRO)	50.0	40.0	80.0	50.0-150	
(S) o-Terphenyl			93.8	18.0-148	

L1527198-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1527198-03 08/22/22 04:46 • (MS) R3828931-3 08/22/22 04:59 • (MSD) R3828931-4 08/22/22 05:12

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Diesel Range Organics (DRO)	49.4	60.6	81.7	79.0	42.7	37.4	1	50.0-150	J6	J6	3.36	20
(S) o-Terphenyl					84.5	70.7		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3828143-1 08/18/22 15:51

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Diesel Range Organics (DRO)	U		33.3	100
Residual Range Organics (RRO)	U		83.3	250
(S) o-Terphenyl	77.0			31.0-160

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3828143-2 08/18/22 16:17 • (LCSD) R3828143-3 08/18/22 16:42

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Diesel Range Organics (DRO)	1500	1230	1350	82.0	90.0	50.0-150			9.30	20
(S) o-Terphenyl				88.0	93.0	31.0-160				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3827401-3 08/16/22 15:23

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Anthracene	U		0.0190	0.0500
Acenaphthene	U		0.0190	0.0500
Acenaphthylene	U		0.0171	0.0500
Benzo(a)anthracene	U		0.0203	0.0500
Benzo(a)pyrene	U		0.0184	0.0500
Benzo(b)fluoranthene	U		0.0168	0.0500
Benzo(g,h,i)perylene	U		0.0184	0.0500
Benzo(k)fluoranthene	U		0.0202	0.0500
Chrysene	U		0.0179	0.0500
Dibenz(a,h)anthracene	U		0.0160	0.0500
Fluoranthene	U		0.0270	0.100
Fluorene	U		0.0169	0.0500
Indeno(1,2,3-cd)pyrene	U		0.0158	0.0500
Naphthalene	U		0.0917	0.250
Phenanthrene	U		0.0180	0.0500
Pyrene	U		0.0169	0.0500
1-Methylnaphthalene	U		0.0687	0.250
2-Methylnaphthalene	U		0.0674	0.250
2-Chloronaphthalene	U		0.0682	0.250
(S) Nitrobenzene-d5	109			31.0-160
(S) 2-Fluorobiphenyl	96.5			48.0-148
(S) p-Terphenyl-d14	112			37.0-146

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827401-1 08/16/22 14:43 • (LCSD) R3827401-2 08/16/22 15:03

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	2.00	2.10	1.96	105	98.0	67.0-150			6.90	20
Acenaphthene	2.00	2.03	2.06	102	103	65.0-138			1.47	20
Acenaphthylene	2.00	1.94	1.83	97.0	91.5	66.0-140			5.84	20
Benzo(a)anthracene	2.00	2.23	2.20	111	110	61.0-140			1.35	20
Benzo(a)pyrene	2.00	2.30	2.27	115	114	60.0-143			1.31	20
Benzo(b)fluoranthene	2.00	2.14	2.02	107	101	58.0-141			5.77	20
Benzo(g,h,i)perylene	2.00	1.97	1.90	98.5	95.0	52.0-153			3.62	20
Benzo(k)fluoranthene	2.00	2.11	2.02	105	101	58.0-148			4.36	20
Chrysene	2.00	2.13	2.10	106	105	64.0-144			1.42	20
Dibenz(a,h)anthracene	2.00	2.09	2.06	105	103	52.0-155			1.45	20
Fluoranthene	2.00	2.22	2.11	111	105	69.0-153			5.08	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3827401-1 08/16/22 14:43 • (LCSD) R3827401-2 08/16/22 15:03

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Fluorene	2.00	2.08	2.11	104	105	64.0-136			1.43	20
Indeno(1,2,3-cd)pyrene	2.00	2.35	2.25	117	112	54.0-153			4.35	20
Naphthalene	2.00	2.04	1.99	102	99.5	61.0-137			2.48	20
Phenanthrene	2.00	1.94	1.95	97.0	97.5	62.0-137			0.514	20
Pyrene	2.00	2.00	2.03	100	102	60.0-142			1.49	20
1-Methylnaphthalene	2.00	2.25	2.16	112	108	66.0-142			4.08	20
2-Methylnaphthalene	2.00	2.39	2.33	119	117	62.0-136			2.54	20
2-Chloronaphthalene	2.00	1.93	1.90	96.5	95.0	64.0-140			1.57	20
(S) Nitrobenzene-d5				112	108	31.0-160				
(S) 2-Fluorobiphenyl				99.5	98.5	48.0-148				
(S) p-Terphenyl-d14				112	110	37.0-146				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3828975-2 08/21/22 10:08

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	82.5			14.0-149
(S) 2-Fluorobiphenyl	84.4			34.0-125
(S) p-Terphenyl-d14	97.2			23.0-120

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3828975-1 08/21/22 09:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0739	92.4	50.0-126	
Acenaphthene	0.0800	0.0708	88.5	50.0-120	
Acenaphthylene	0.0800	0.0707	88.4	50.0-120	
Benzo(a)anthracene	0.0800	0.0774	96.8	45.0-120	
Benzo(a)pyrene	0.0800	0.0836	105	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0791	98.9	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0775	96.9	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0801	100	49.0-125	
Chrysene	0.0800	0.0813	102	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0814	102	47.0-125	
Fluoranthene	0.0800	0.0765	95.6	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3828975-1 08/21/22 09:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0745	93.1	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0830	104	46.0-125	
Naphthalene	0.0800	0.0669	83.6	50.0-120	
Phenanthrene	0.0800	0.0748	93.5	47.0-120	
Pyrene	0.0800	0.0857	107	43.0-123	
1-Methylnaphthalene	0.0800	0.0663	82.9	51.0-121	
2-Methylnaphthalene	0.0800	0.0682	85.3	50.0-120	
2-Chloronaphthalene	0.0800	0.0680	85.0	50.0-120	
(S) Nitrobenzene-d5			89.1	14.0-149	
(S) 2-Fluorobiphenyl			87.2	34.0-125	
(S) p-Terphenyl-d14			97.7	23.0-120	

L1527074-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1527074-10 08/21/22 13:23 • (MS) R3828975-3 08/21/22 13:41 • (MSD) R3828975-4 08/21/22 13:58

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	ND	0.0791	0.0646	94.0	75.9	1	10.0-145			20.2	30
Acenaphthene	0.0800	ND	0.0651	0.0562	81.4	70.3	1	14.0-127			14.7	27
Acenaphthylene	0.0800	ND	0.0603	0.0551	72.5	66.0	1	21.0-124			9.01	25
Benzo(a)anthracene	0.0800	0.0182	0.137	0.0862	148	85.0	1	10.0-139	J5	J3	45.5	30
Benzo(a)pyrene	0.0800	0.0240	0.140	0.0903	145	82.9	1	10.0-141	J5	J3	43.2	31
Benzo(b)fluoranthene	0.0800	0.0271	0.153	0.0873	157	75.3	1	10.0-140	J5	J3	54.7	36
Benzo(g,h,i)perylene	0.0800	0.0201	0.0974	0.0742	96.6	67.6	1	10.0-140			27.0	33
Benzo(k)fluoranthene	0.0800	0.00966	0.0929	0.0684	104	73.4	1	10.0-137			30.4	31
Chrysene	0.0800	0.0194	0.151	0.0913	165	89.9	1	10.0-145	J5	J3	49.3	30
Dibenz(a,h)anthracene	0.0800	ND	0.0715	0.0577	84.4	67.1	1	10.0-132			21.4	31
Fluoranthene	0.0800	0.0356	0.227	0.117	239	102	1	10.0-153	J5	J3	64.0	33
Fluorene	0.0800	ND	0.0676	0.0587	84.5	73.4	1	11.0-130			14.1	29
Indeno(1,2,3-cd)pyrene	0.0800	0.0185	0.105	0.0767	108	72.8	1	10.0-137			31.2	32
Naphthalene	0.0800	ND	0.0593	0.0541	74.1	67.6	1	10.0-135			9.17	27
Phenanthrene	0.0800	0.0180	0.166	0.103	185	106	1	10.0-144	J5	J3	46.8	31
Pyrene	0.0800	0.0398	0.218	0.124	223	105	1	10.0-148	J5	J3	55.0	35
1-Methylnaphthalene	0.0800	ND	0.0587	0.0538	73.4	67.3	1	10.0-142			8.71	28
2-Methylnaphthalene	0.0800	ND	0.0603	0.0591	75.4	73.9	1	10.0-137			2.01	28
2-Chloronaphthalene	0.0800	ND	0.0568	0.0490	71.0	61.3	1	29.0-120			14.7	24
(S) Nitrobenzene-d5					85.3	77.7		14.0-149				
(S) 2-Fluorobiphenyl					72.9	69.2		34.0-125				
(S) p-Terphenyl-d14					70.0	65.6		23.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3829537-2 08/21/22 11:50

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	74.6			14.0-149
(S) 2-Fluorobiphenyl	73.9			34.0-125
(S) p-Terphenyl-d14	73.9			23.0-120

1
Cp

2
Tc

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Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS)

(LCS) R3829537-1 08/21/22 11:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0638	79.8	50.0-126	
Acenaphthene	0.0800	0.0614	76.8	50.0-120	
Acenaphthylene	0.0800	0.0601	75.1	50.0-120	
Benzo(a)anthracene	0.0800	0.0644	80.5	45.0-120	
Benzo(a)pyrene	0.0800	0.0652	81.5	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0607	75.9	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0594	74.3	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0606	75.8	49.0-125	
Chrysene	0.0800	0.0642	80.3	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0609	76.1	47.0-125	
Fluoranthene	0.0800	0.0658	82.3	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3829537-1 08/21/22 11:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0629	78.6	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0627	78.4	46.0-125	
Naphthalene	0.0800	0.0560	70.0	50.0-120	
Phenanthrene	0.0800	0.0602	75.3	47.0-120	
Pyrene	0.0800	0.0631	78.9	43.0-123	
1-Methylnaphthalene	0.0800	0.0599	74.9	51.0-121	
2-Methylnaphthalene	0.0800	0.0627	78.4	50.0-120	
2-Chloronaphthalene	0.0800	0.0587	73.4	50.0-120	
(S) Nitrobenzene-d5			83.5	14.0-149	
(S) 2-Fluorobiphenyl			79.6	34.0-125	
(S) p-Terphenyl-d14			77.3	23.0-120	

L1525184-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1525184-16 08/21/22 12:08 • (MS) R3829537-3 08/21/22 12:25 • (MSD) R3829537-4 08/21/22 12:43

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0889	ND	0.0461	0.0471	51.9	53.0	1	10.0-145			2.15	30
Acenaphthene	0.0889	0.0146	0.0560	0.0555	46.6	46.0	1	14.0-127			0.997	27
Acenaphthylene	0.0889	ND	0.0476	0.0478	53.5	53.8	1	21.0-124			0.466	25
Benzo(a)anthracene	0.0889	ND	0.0462	0.0502	45.8	50.3	1	10.0-139			8.29	30
Benzo(a)pyrene	0.0889	ND	0.0409	0.0471	40.8	47.8	1	10.0-141			14.1	31
Benzo(b)fluoranthene	0.0889	ND	0.0369	0.0419	36.8	42.5	1	10.0-140			12.7	36
Benzo(g,h,i)perylene	0.0889	0.0123	0.0373	0.0441	28.1	35.8	1	10.0-140			16.6	33
Benzo(k)fluoranthene	0.0889	ND	0.0335	0.0375	37.6	42.1	1	10.0-137			11.3	31
Chrysene	0.0889	ND	0.0443	0.0486	43.4	48.1	1	10.0-145			9.09	30
Dibenz(a,h)anthracene	0.0889	ND	0.0325	0.0389	36.5	43.8	1	10.0-132			18.1	31
Fluoranthene	0.0889	ND	0.0498	0.0523	49.4	52.3	1	10.0-153			5.01	33
Fluorene	0.0889	0.0179	0.0588	0.0590	46.0	46.3	1	11.0-130			0.377	29
Indeno(1,2,3-cd)pyrene	0.0889	ND	0.0338	0.0406	38.0	45.6	1	10.0-137			18.2	32
Naphthalene	0.0889	ND	0.0497	0.0498	46.2	46.3	1	10.0-135			0.223	27
Phenanthrene	0.0889	0.0258	0.0622	0.0638	41.0	42.7	1	10.0-144			2.47	31
Pyrene	0.0889	0.0122	0.0528	0.0546	45.6	47.6	1	10.0-148			3.31	35
1-Methylnaphthalene	0.0889	0.0900	0.107	0.104	19.1	16.0	1	10.0-142			2.63	28
2-Methylnaphthalene	0.0889	0.0978	0.117	0.111	21.2	15.0	1	10.0-137			4.88	28
2-Chloronaphthalene	0.0889	ND	0.0435	0.0429	48.9	48.3	1	29.0-120			1.29	24
(S) Nitrobenzene-d5					59.0	64.4		14.0-149				
(S) 2-Fluorobiphenyl					56.1	54.3		34.0-125				
(S) p-Terphenyl-d14					52.4	53.4		23.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

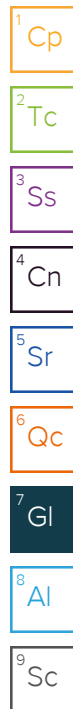
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
C4	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result.
C5	The reported concentration is an estimate. The continuing calibration standard associated with this data responded high. Data is likely to show a high bias concerning the result.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.



GLOSSARY OF TERMS

Qualifier	Description	
J3	The associated batch QC was outside the established quality control range for precision.	¹ Cp
J4	The associated batch QC was outside the established quality control range for accuracy.	
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.	² Tc
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.	
V	The sample concentration is too high to evaluate accurate spike recoveries.	³ Ss
		⁴ Cn
		⁵ Sr
		⁶ Qc
		⁷ Gl
		⁸ Al
		⁹ Sc

ACCREDITATIONS & LOCATIONS

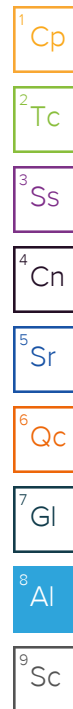
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.



Company Name/Address: Hahn & Associates, Inc. 434 NW 6th Avenue Ste. 203 Portland, OR 97209				Billing Information: Valerie Allen 434 NW 6th Ave., Ste. 203 Portland, OR 97209 Email To: robe@hahnen.com				Pres Chk		Analysis / Container / Preservative										Chain of Custody Page 1 of 2																					
																				MT JULIET, TN 12065 Lebanon Rd Mount Juliet, TN 37122 Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubs/pas-standard-terms.pdf SDG # L1525184 F244																					
Report to: Rob Ede				Project Description: Larsen Property				City/State Collected: Grand Ronde, OR		Please Circle: PT MT CT ET		<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><td colspan="2">soil DX no silica 8ozClr-NoPres</td></tr> <tr><td colspan="2">soil GX 40mlAmb/MeOH10ml/Syr</td></tr> <tr><td colspan="2">soil PAHs 8270ESIM 8ozClr-NoPres</td></tr> <tr><td colspan="2">soil RCRA8 Metals 8ozClr-NoPres</td></tr> <tr><td colspan="2">soil VOCs 8260D 40mlAmb/MeOH10ml/Syr</td></tr> <tr><td colspan="2">water DX no silica 100ml Amb-HCl</td></tr> <tr><td colspan="2">water FF RCRA8 Metal 250mlHDPE HNO3</td></tr> <tr><td colspan="2">water GX 40mlAmb HCl</td></tr> <tr><td colspan="2">water PAHs 8270ESIM 40mlAmb-NoPres-WT</td></tr> <tr><td colspan="2">water VOCs 8260D 40mlAmb-HCl</td></tr> </table>										soil DX no silica 8ozClr-NoPres		soil GX 40mlAmb/MeOH10ml/Syr		soil PAHs 8270ESIM 8ozClr-NoPres		soil RCRA8 Metals 8ozClr-NoPres		soil VOCs 8260D 40mlAmb/MeOH10ml/Syr		water DX no silica 100ml Amb-HCl		water FF RCRA8 Metal 250mlHDPE HNO3		water GX 40mlAmb HCl		water PAHs 8270ESIM 40mlAmb-NoPres-WT		water VOCs 8260D 40mlAmb-HCl	
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water VOCs 8260D 40mlAmb-HCl																																									
Phone: 503-796-0717		Client Project # 9862		Lab Project # HAHNPOR-9862																																					
Collected by (print): Rob Ede		Site/Facility ID # 24716 SW GRAND RONDE RD		P.O. # 9862																																					
Collected by (signature): 		Rush? (Lab MUST Be Notified) Same Day ☒ Five Day ☐ Next Day ☐ 5 Day (Rad Only) ☐ Two Day ☐ 10 Day (Rad Only) ☐ Three Day ☐		Quote #		Date Results Needed																																			
Immediately Packed on Ice N ☐ Y ☒				5 DAY Dx, 6x in Soil (Vocs if)		No. of Cntrs																																			
Sample ID		Comp/Grab	Matrix *	Depth	Date	Time																																			
9862-220811-100		GRAB	GW	10-20	8/11/22	1350	11																																		
9862-220811-101		GRAB	GW	9-19	8/11/22	1530	10																																		
			GW																																						
9862-220811-01		GRAB	SS	9-9.5	8/11/22	844	2	X	X																																
9862-220811-02			SS	12-12.5		848	2																																		
9862-220811-03			SS	14.5-15		9:00	2																																		
9862-220811-04			SS	17.5-18		9:23	2																																		
9862-220811-05			SS	19.5-20		9:30	2																																		
9862-220811-06			SS	8.5-9		1015	2	X	X	X																															
9862-220811-07			SS	11.0-11.5		121	2	X	X																																
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater DW - Drinking Water OT - Other		Remarks:		Samples returned via: UPS ☐ FedEx ☐ Courier ☐		per request of Rob Ede: • 9862-220811-06: Add PAHs • 9862-220811-12: Add PAHs • 9862-220811-14: Add TPH-Dx and PAHs • 9862-220811-16: Add PAHs and VOCs -bjf 08/19/22		pH _____ Temp _____ low _____ Other _____		Sample Receipt Checklist COC Seal Present/Intact: ☒ NP ☐ COC Signed/Accurate: ☒ N ☐ Bottles arrive intact: ☒ N ☐ Correct bottles used: ☒ N ☐ Sufficient volume sent: ☒ N ☐ If Applicable VOA Zero Headspace: ☒ N ☐ Preservation Correct/Checked: ☒ N ☐ RAD Screen <0.5 mR/hr: ☒ N ☐																															
Relinquished by: (Signature) 		Date: 8/12/22		Time: 12:30				Blank Received: Yes/No 2 8		Bottles Received: 61																															
Relinquished by: (Signature)		Date:		Time:				°C		If preservation required by Login: Date/Time																															
Relinquished by: (Signature)		Date:		Time:		Received for lab by: (Signature) 		Date: 8/13/22		Time: 9:00		Hold:		Condition: NCF / OK																											

Company Name/Address:
Hahn & Associates, Inc.

434 NW 6th Avenue
Ste. 203
Portland, OR 97209

Billing Information:

Valerie Allen
434 NW 6th Ave., Ste. 203
Portland, OR 97209

Report to:
Rob Ede

Email To: robe@hahnen.com

Project Description:
Larsen Property

City/State
Collected: **Grand Ronde, OR**

Please Circle:
PT MT CT ET **PT**

Phone: **503-796-0717**

Client Project #
9862

Lab Project #
HAHNPOR-9862

Collected by (print):
Rob Ede

Site/Facility ID #
24716 SW GRAND RONDE RD

P.O. #
9862

Collected by (signature):
[Signature]

Rush? (Lab MUST Be Notified)
☒ Same Day ☒ Five Day
☐ Next Day ☐ 5 Day (Rad Only)
☐ Two Day ☐ 10 Day (Rad Only)
☐ Three Day

Quote #

Immediately Packed on Ice N ☒ Y ☒

Date Results Needed
5 DAY Gx/10x VGC (if possible)

No. of Cntrs

Analysis / Container / Preservative

Chain of Custody

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: <https://info.pacelabs.com/hubfs/pas-standard-terms.pdf>

SDG # **L1525184**

Table #

Acctnum: **HAHNPOR**

Template: **T213731**

Prelogin: **P941367**

PM: **110 - Brian Ford**

PB:

Shipped Via:

Remarks

Sample # (lab only)

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	soil DX no silica 8ozClr-NoPres	soil GX 40mlAmb/MeOH10ml/Syr	soil PAHs 8270ESIM 8ozClr-NoPres	soil RCRA8 Metals 8ozClr-NoPres	soil VOCs 8260D 40mlAmb/MeOH10ml/Syr	water DX no silica 100ml Amb-HCl	water FF RCRA8 Metal 250mlHDPE HNO3	water GX 40mlAmb HCl	water PAHs 8270ESIM 40mlAmb-NoPres-WT	water VOCs 8260D 40mlAmb-HCl
9862-220811-08	GRAB	SS	135-14	8-11-22	12:25	2										
9862-220811-09		SS	7-7.5		10:40	2	X	X								
9862-220811-10		SS	95-10		10:45	2	X	X								
9862-220811-11		SS	12-12.5		10:50	2										
9862-220811-12		SS	5-5.5		11:15	2	X	X								
9862-220811-13		SS	8-8.5		11:18	2	X	X								
9862-220811-14		SS	12-12.5		11:28	2										
9862-220811-15		SS	6-6.5		12:15	2	X	X								
9862-220811-16		SS	7-7.5		12:18	2	X	X		X						
9862-220811-17		SS	10.5-11		12:25	2	X	X								

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

Samples returned via:
☐ UPS ☐ FedEx ☐ Courier

Tracking #

Relinquished by: (Signature)
[Signature]

Date:
8/12/22

Time:
1230

Received by: (Signature)
[Signature]

Trip Blank Received: Yes / No
HCL / MeOH
TBR

Temp: °C

Bottles Received:

If preservation required by Login: Date/Time

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)
[Signature]

Date:
8/13/22

Time:
900

Hold:

Condition:
NCF / OK

Sample Receipt Checklist

COC Seal Present/Intact: ☒ NP ☐ N

COC Signed/Accurate: ☒ N ☐ N

Bottles arrive intact: ☒ N ☐ N

Correct bottles used: ☒ N ☐ N

Sufficient volume sent: ☒ N ☐ N

If Applicable

VOA Zero Headspace: ☒ N ☐ N

Preservation Correct/Checked: ☒ N ☐ N

RAD Screen <0.5 mR/hr: ☒ N ☐ N

[illegible]

68152517

<u>Tracking Numbers</u>	<u>Temperature</u>
5829 4698 2810	MMAT 3.3 to = 3.3
5300 4298 7097	MMAT 1.1 to = 1.1