May 8, 2020

Amelia Shelly
Fort Vancouver Regional Libraries
1007 E Mill Plain Boulevard
Vancouver, Washington 98663

Via email: ashelley@fvrl.org

Regarding: Phase II Environmental Site Assessment
Lots 3 through 6, West Side of Block 8,
North of Main Street, and East of Durgan Street
Washougal, Washington
PBS Project 24061.001

Dear Ms. Shelly:

PBS Engineering and Environmental Inc. (PBS) has completed a Phase II Environmental Site Assessment (ESA) at the property located at Lots 3 through 6, west side of Block 8, north of Main Street, and east of Durgan Street in Washougal, Washington (Site; Figure 1). This report summarizes the project background, field sampling activities, and test results.

PROJECT BACKGROUND AND PURPOSE

PBS previously conducted a Phase I ESA in December 2019. The Site was found to have been used as an auto wash business and a battery charging business in the late 1920s and early 1930s. It is unknown if auto repair activities also occurred on the property. Auto repair involves storage and transfer of potentially hazardous chemical compounds. This investigation was conducted to address the concern that these operations could pose a risk for current and potential future residential usage.

FIELD ACTIVITIES

Prior to beginning the subsurface field investigation, PBS filed a public utility notification request and procured drilling, private locating, and laboratory services. A site-specific health and safety plan (HASP) was prepared and reviewed with field personnel and subcontractors before beginning work.

February 11, 2020 – Geophysical Survey

A geophysical survey was completed on March 25, 2020, by Pacific Geophysics of Portland, Oregon, to locate possible underground storage tanks (USTs) located where former commercial operations were located. This survey found no surface or subsurface evidence of USTs in the survey area. A copy of the geophysical survey report is provided in Appendix A.

March 16, 2020 – Utility Locate

PBS supervised Pacific Northwest LLC of Happy Valley, Oregon, while they conducted borehole clearance for subsurface obstructions and utilities.

March 19, 2020 – Site Assessment
On March 19, 2020, PBS was on site to conduct the soil and soil gas investigation with Cascade Drilling of Clackamas, Oregon, providing drilling and soil gas extraction services. A direct-push drill rig was used to advance the borings.

Six borings were advanced up to 10 feet below ground surface (bgs; see Figure 2). PBS collected a total of six soil samples and three soil gas samples in the existing parking lot of the subject property: two on the western side, two on the eastern side, and one at each entrance from the north and south from C Street and Main Street respectively. Photo documentation of field activities is provided in Appendix B.

Soil was logged continuously, noting grain size, color, odor, and moisture. Soil samples were collected in accordance with PBS' Standard Operating Procedure (SOP) Drilling and Soil Sampling Procedures (see Appendix C). Soil was field screened for the presence of petroleum and volatile organic compounds (VOCs) by visual/olfactory observation and by handheld photoionization detector (PID).

Soil was observed to consist of aggregate fill to depths of approximately 0.25-foot bgs, underlain by a poorly graded gray gravel with silt to depths of approximately 3 to 5 feet bgs. Moist, brown silt was observed to depths of approximately 5 to 7.5 feet bgs, and gray gravel and gray sandy gravel was observed to total depths explored of 10 feet bgs. PBS did not identify evidence of contamination such as petroleum odor, sheen, or soil staining. In the absence of field indications of contamination, one soil sample was collected from depths ranging from 1 to 4 feet bgs, depending on the gravel content, which influences the quality of the sample. PID measurements, sheen testing, and soil descriptions are provided in the boring logs (see Appendix D).

PBS collected three soil gas samples in the northern section of the Site due to proximity of the historical gas station located to the north. Soil gas samples were collected in accordance with PBS' SOP Sub-Slab Vapor and Soil gas Sampling. Soil gas sample logs with helium testing results are provided in Appendix E.

Soil and soil gas sampling locations are shown on Figure 2. Groundwater was not encountered during this sampling event.

Samples were collected in laboratory-supplied containers, placed on ice in a cooler, and transported to Pace Analytical of Mount Juliet, Tennessee, with chain-of-custody documentation. Analysis was conducted on a standard turnaround time.

Sampling equipment and drill rods were decontaminated between borings using a detergent wash and tap water rinse. PBS personnel wore new disposable nitrile gloves when collecting samples. Upon completion of sampling, the temporary boreholes were backfilled and sealed with bentonite, and the surface restored to match the surrounding asphalt.

ANALYTICAL PROGRAM, RESULTS, AND RISK SCREENING

The following section presents the sample analysis, results, and findings. Soil and soil gas results are shown in Tables 1 and 2, respectively. Laboratory reports are provided in Appendix F.

Analytical Program

The following analysis were completed on six soil samples:

- Total petroleum hydrocarbons (TPH) as gasoline by Northwest Method TPH-Gx;
- TPH as diesel and oil by Northwest Method TPH-Dx;

- VOCs by Environmental Protection Agency (EPA) Method 8260B; and
- Metals by Method 8260D.

The following analysis were completed on three soil gas samples:

- VOCs by EPA Method TO-15.

Results
The following section presents the analytical results.

- **Soil**. No soil concentrations exceeded the laboratory method reporting limit (MRL) for TPH as gasoline. Two samples, SB-1 and SB-6, contained concentrations of 59.9 and 6.88 milligrams per kilogram (mg/kg) of TPH as diesel. Two samples, SB-1 and SB-6, have detections of 299 and 39.6 mg/kg of TPH as residual range organics, respectively.

  Soil samples SB-1, SB-3, and SB-5 had detections above MRLs. Each sample contained lead above the laboratory detection limit.

- **Soil gas**. Soil gas samples contained concentrations above the MRL for 28 VOCs. Samples SG-1, SG-2, and SG-3 contained concentrations of 16.1, 65.5 and 40.2 micrograms per cubic meter (µg/m^3) of benzene, and 14.2, 97.4 and 87.2 µg/m3 of 1,3-butadiene, respectively. Sample SG-1 contained 22.2 µg/m^3 of chloroform.

Risk Screening
The following section presents the results of risk screening.

- **Soil**. Soil results were compared to (1) Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A cleanup levels, and (2) the Ecology natural background soil metals concentrations. No soil concentrations exceeded Ecology MTCA cleanup levels.

  Several soil samples exceed the screening levels set by Ecology for natural background soil metals concentrations. Samples SB-1 and SB-5 had detections of 0.079 and 0.102 mg/kg of mercury that are above the natural background soil metals concentrations. Soil samples SB-1, SB-3, and SB-5 have values above the natural background soil metals concentrations, none of which exceed the MTCA cleanup levels.

- **Soil gas**. Soil gas results were compared to Ecology's Method B screening levels as defined in the Cleanup Levels and Risk Calculation (CLARC) table. Seven concentrations exceeded respective screening levels. These included 22.2 µg/m^3 of chloroform in SG-1; 16.1 µg/m^3, 65.5 µg/m^3, and 40.2 µg/m^3 of benzene in SG-1, SG-2, and SG-3; and 14.2 µg/m^3, 97.4 µg/m^3, and 87.2 µg/m^3 of 1,3-butadiene in SG-1, SG-2, and SG-3, respectively.

CONCLUSIONS AND RECOMMENDATIONS

None of the detected soil concentrations exceed the Ecology MTCA Method A cleanup levels.

One or more compounds from all three of the soil gas samples exceeded Ecology's MTCA Method B cleanup levels.

The volatilization to outdoor air and vapor intrusion into building pathways is potentially complete for future residential and occupational receptors. All three soil gas samples had detections that are above the screening levels set for benzene and 1,3-butadiene. Soil gas sample SG-1 exceeded the screening level set for chloroform. Chloroform is a common laboratory contaminant, however elevated benzene concentrations in soil gas may

suggest petroleum contamination at depth or in groundwater. Therefore, PBS recommends that if future site development is planned, vapor mitigation measures should be considered and a contaminated media management plan should be in place before commencing any construction activities.

LIMITATIONS

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This study was limited to the tests, locations, and depths as indicated to determine the absence or presence of certain contaminants. The site as a whole may have other contamination that was not characterized by this study. The findings and conclusions of this report are not scientific certainties, but probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. PBS is not able to represent that the site or adjoining land contain no hazardous waste, oil, or other latent conditions beyond that detected or observed by PBS.

Please feel free to contact me at 503.417.7613 or shad.brooks@pbsusa.com with any questions or comments.

Sincerely,

Digitally signed by Shad L Brooks
Date: 2020.05.08 15:44:30 -07'00'

Shad Brooks
Staff Geologist

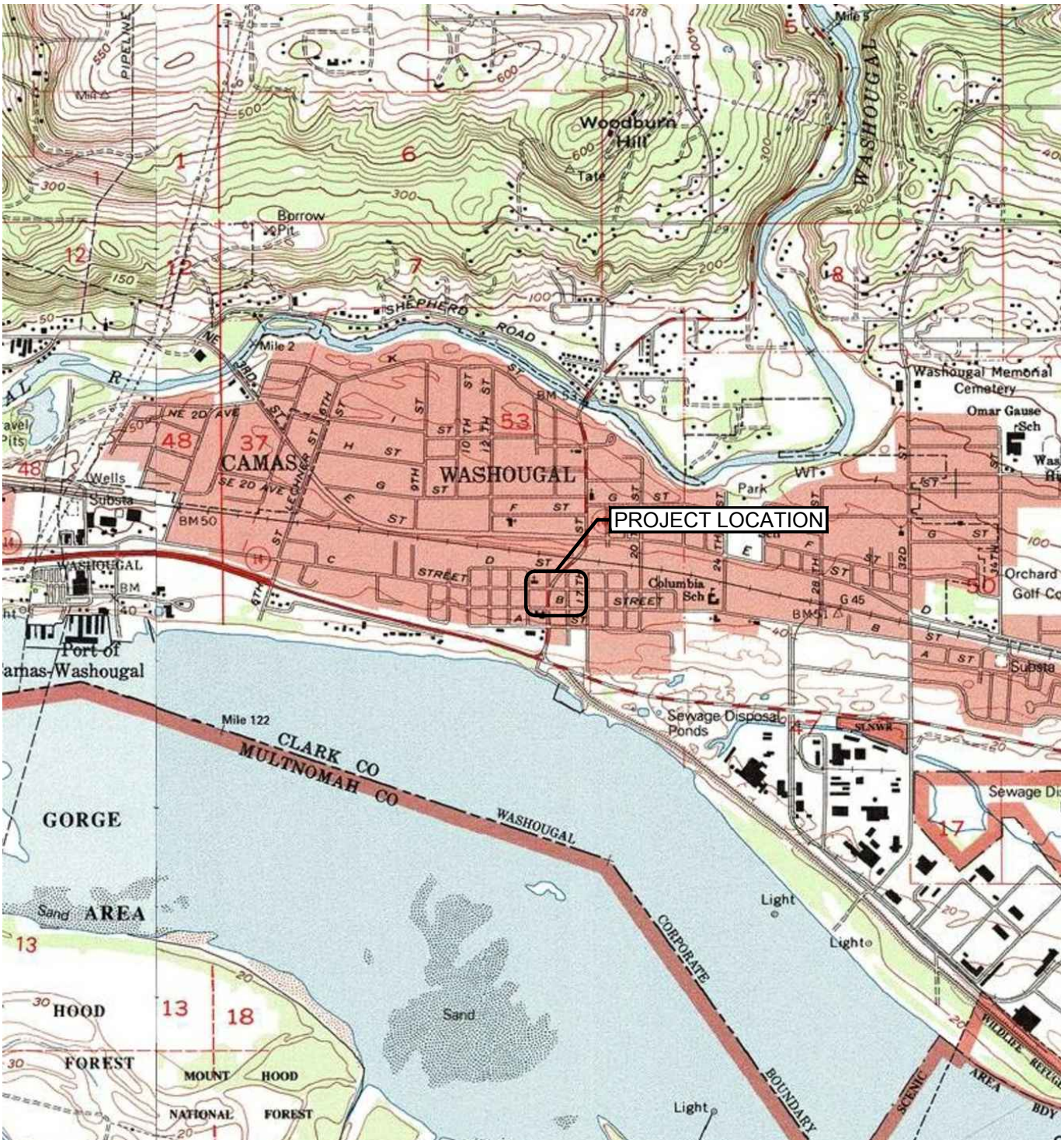
Digitally signed by Christopher Sheridan
Date: 2020.05.08 15:41:03 -07'00'

Chris Sheridan, RG
Senior Project Manager

Attachments: Figures
Tables
Appendix A. Geophysical Survey
Appendix B. Photo Documentation
Appendix C. Standard Operating Procedures
Appendix D. Boring Logs
Appendix E: Soil gas Logs
Appendix F: Laboratory Reports

SB:CS:mo

Figures



SOURCE: USGS WASHOUGAL, WA OR QUADRANGLE 1994.

WASHINGTON

Scale 1" = 2000'

0' 1000' 2000' 4000'

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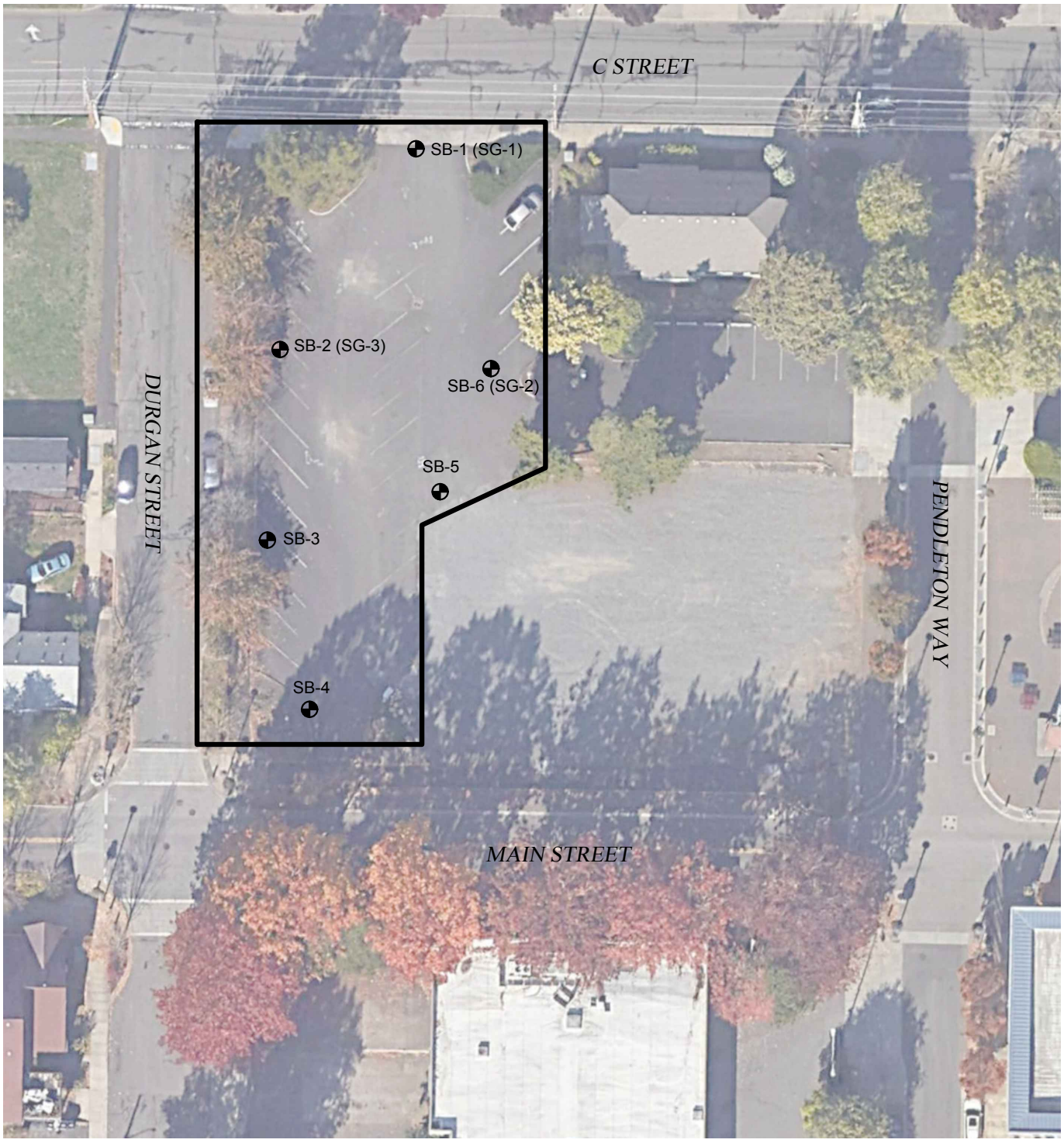
PBS

VICINITY MAP

MAIN STREET AND DURGAN STREET
WASHOUGAL, WASHINGTON

MAY 2020
24061.001

FIGURE
1



SOURCE: © 2019 GOOGLE EARTH PRO

LEGEND

SB-1 BORING NUMBER AND LOCATION

Scale 1" = 50'

0' 25' 50' 100'

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SITE PLAN

MAIN STREET AND DURGAN STREET
WASHOUGAL, WASHINGTON

MAY 2020
24061.001

FIGURE
2

Tables

Table 1. Summary of Detected Soil Sample Analytical Results

Main Street and Durgan Street
Washougal, Washington

Sample ID	Sample Date	Depth Collected (feet bgs)	TPH			Detected Metals					
			Gasoline	Diesel	Heavy Oil	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury
			mg/kg								
SB-1	3/19/2020	1.5-3.5	<2.90	59.9	299	5.25	195	0.627	22.5	**171**	**0.0794**
SB-2	3/19/2020	1-4	<3.14	<5.02	<12.5	5.44	118	<0.627	19.9	12.6	<0.0376
SB-3	3/19/2020	1.5-3	<3.21	<5.14	13.5	4.94	180	<0.642	19.6	**29.8**	0.0392
SB-4	3/19/2020	1.5-3.5	<2.86	<4.58	<11.4	3.25	203	<0.572	11.3	15.8	<0.0343
SB-5	3/19/2020	1-2.5	<3.03	<4.85	<12.1	4.22	245	<0.606	16.4	**171**	**0.102**
SB-6	3/19/2020	1.5-3.5	<3.04	6.88	39.6	4.50	202	<0.608	15.8	9.24	<0.0365
MTCA Method A Soil Cleanup Level[1]			30	2,000	2,000	20	NS	2	2,000	250	2
Clark County Regional Metals Background[2]			NA	NA	NA	6	NS	1	27	**17**	**0.04**

Notes:

See laboratory report for full list of analytes and method reporting limits.

Bold: Indicates an exeedance of the regional background concentrations and/or Method A Soil Cleanup Levels for Unrestricted Land Use.

<: Not detected above the laboratory reporting limit

bgs: below ground surface

mg/kg: milligrams per kilogram

MTCA: Model Toxics Control Act

NA: Not applicable

NS: No set value

RBCs: risk-based concentration

TPH: total petroleum hydrocarbons

[1]Washington State Department of Ecology *Model Toxics Control Act Regulation and Statute, Table 740-1. Method A Soil Celanup Levels for Unrestricted Land Uses.* Revised 2013.

[2]Washington State Department of Ecology *Natural Background Soil Metals Concentrations in Washington State.* October 1994.

Table 2. Summary of Detected Soil-Gas Sample Analytical Results

Main Street and Durgan Street
Washougal Washington

Volatile Organic Compounds (Detection Only)		Sample ID			CLARC Vapor Intrusion Method B[1]
		SG-1	SG-2	SG-3	
Boring Sample Location		SB-1	SB-6	SB-3	
Sample Date		3/19/2020	3/19/2020	3/19/2020	
Acetone	µg/m^3	30.2	68	33.7	14000.00
Benzene		**16.1**	**65.5**	**40.2**	**11.00**
1,3-Butadiene		**14.2**	**97.4**	**87.2**	**2.80**
Carbon disulfide		2.06	16.1	3.92	400.00
Chloroform		**22.2**	< 0.973	< 0.973	**3.60**
Chloromethane		1.32	3.51	1.15	1400.00
Cyclohexane		< 0.689	8.09	3.58	NS
1,1-Dichloroethene		< 0.793	< 0.793	1.05	3000.00
Ethanol		15.9	21.5	34.7	NS
Ethylbenzene		2.72	7.33	5.68	15000.00
4-Ethyltoluene		1.65	3.52	2.46	NS
Trichlorofluoromethane		2.57	1.56	2.71	11000.00
Dichlorodifluoromethane		2.41	4.25	2.51	1500.00
Heptane		1.78	15.3	14.7	180.00
n-Hexane		4.3	617	39.5	11000.00
Isopropylbenzene		< 0.983	1.04	< 0.983	6100.00
2-Butanone (MEK)		7.49	17.2	9.08	NS
2-Propanol		< 3.07	4.77	3.64	NS
Propene		76.8	482	372	NS
Styrene		2.07	7.49	2.47	15000.00
Tetrachloroethene		< 1.36	< 1.36	1.74	610.00
Toluene		17.4	55	36.5	76000.00
1,2,4-Trimethylbenzene		1.42	2.98	1.77	910.00
2,2,4-Trimethylpentane		< 0.934	4.28	< 0.934	NS
Vinyl chloride		< 0.511	1.15	< 0.511	1500.00
m&p-Xylene		5.42	14.4	8.84	1500.00
o-Xylene		2.69	6.72	3.88	1500.00
TPH (gc/ms) low fraction		< 826	3000	1300	4700.00

Notes:

See laboratory report for full list of analytes and method reporting limits.

NS: Analyte not set

Bold: Indicates an exeedance of the Cleanup Levels and Risk Calculation (CLARC) Air Table (Method B)

µg/m^3: micrograms per cubic meter

[1] Washington State Department of Ecology. Cleanup Levels and Risk Calculation (CLARC) Vapor Intrusion Table (Method B). January 2020.

Table 3. Helium Leak Detection Results

Main Street and Durgan Street

Washougal Washington

Sample ID	Sample Date	[1]Helium Concentration (shroud)	Helium Concentration (sample)	Percentage of Helium in Sample	Leak Test Results
		ppmv	ppmv	%	pass/not pass
SG-1	3/19/2020	540,000	279,000	0.52	pass
SG-2		526,667	597,000	1.13	pass
SG-3		553,333	100,000	0.00	pass

Notes:

[1]Readings taken using a Dielectric MGD-20002 Helium Meter (average of pre-sample and post-sample readings).

ppmv: parts per million volume

pass: percent of helium in sample is less than 5%

Appendix A

Geophysical Survey

Pacific Geophysics – March 25, 2020

LETTER REPORT

PROJECT #: 200125
SURVEY DATE: 2/11/2020

Chris Sheridan
PBS Environmental

Vacant Lot
Main Street and Durgan Street
Washougal, Washington

A geophysical survey was conducted across the L-shaped lot located to the northeast of the intersection of Main Street and Durgan Street in Washougal, for PBS Environmental. The survey area is shown in Figure 1. The scope of the survey was to locate possible underground storage tanks (USTs). A bank building was formerly located at the southeastern quadrant of the block that is now gravel-covered. No surface evidence of USTs, like fill ports and vent pipes, was seen in the survey area.

The survey covered the asphalt-covered west half, the sidewalks and the gravel area, as shown in Figure 1. A Geometrics G858 cesium-vapor magnetometer was used to collect magnetic data across the survey area. A grid was established across the site with a measuring wheel and tapes. Traverses were made along survey lines spaced every 5 feet. Figure 2 shows the resulting magnetic map. Data were contoured using a contour interval of 250 nT (nanoTesla). In the figure, magnetic anomalies higher in amplitude than the normal local magnetic background are shown in red and are usually found over areas where ferrous objects are located below the sensor, carried at a height of about 3 feet. USTs usually produce red-colored anomalies. Magnetic anomalies at or below the amplitude of the local magnetic field are shown in blue and are generally caused by ferrous objects located above the sensor. Buildings, fences, metal posts, and cars, usually produce magnetic lows. Depending on their size and orientation, large buried objects may produce both positive (red) and negative (blue) anomalies.

Surface metallic features included sign posts, street lights, numerous vaults, yard lights, street lights, a parked car, and three metal tree-root grates. These features created magnetic interference. Buried metallic objects of interest located near or under these objects may have been missed because of the magnetic noise produced by the surface objects.

A Schonstedt magnetic gradiometer and an Aqua-Tronics Tracer metal detector were used to pinpoint and characterize the anomalies found with this survey. The Tracer is excellent at determining if a buried object is linear (a possible pipe) or 3D (a possible UST).

Several anomalies were investigated with hand-held metal detectors and are described below:

No three-dimensional object was detected with the Tracer at the location of magnetic anomaly A.

Magnetic anomalies B and C are caused by surface metal.

No 3D object was detected at the location of anomaly D.

Anomalies E are caused by 3D objects of irregular sizes, as indicated by the Tracer. A GSSI SIR-2000 ground-penetrating radar (GPR) system with a 400-MHz antenna was used across these objects. No suspicious reflections were seen in the profiles. The objects causing the anomalies appear to be metallic debris. According to the property owner who visited the site during the survey, a tunnel between the bank and a remote teller machine was filled in with concrete debris in this area. The anomalies may be caused by this debris.

No USTs were detected with this survey.

Nikos Tzetos of Pacific Geophysics conducted the survey for Mr. Chris Sheridan of PBS Environmental on February 11, 2020. This letter report was written by Nikos Tzetos and emailed to Mr. Sheridan on February 17, 2020.

Limitations

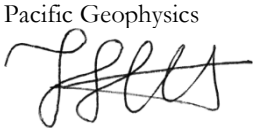
The conclusions presented in this report were based upon widely accepted geophysical principles, methods and equipment. This survey was conducted with limited knowledge of the site, the site history and the subsurface conditions.
The goal of near-surface geophysics is to provide a rapid means of characterizing the subsurface using non-intrusive methods. Conclusions based upon these methods are generally reliable; however, due to the inherent ambiguity of the methods, no single interpretation of the data can be made. As an example, rocks and roots produce radar reflections that may appear the same as pipes and tanks.

Under reasonable conditions, geophysical surveys are good at detecting changes in the subsurface caused by man-made objects or changes in subsurface conditions, but they are poor at actually identifying those objects or subsurface conditions.

Objects of interest are not always detectable due to surface and subsurface conditions. The deeper an object is buried, the more difficult it is to detect, and the less accurately it can be located.

The only way to see an object is to physically expose it.

Nikos Tzetos
Pacific Geophysics



February 17, 2020

Appendix A. Geophysical Survey Methods

Magnetometer Surveys

Small disturbances in the Earth's local magnetic field are called "magnetic anomalies". These may be caused by naturally occurring features such as metallic mineral ore bodies, or from manmade features such as metal buildings, vehicles, fences, and underground storage tanks. The magnetometer only detects changes produced by ***ferrous*** objects. Aluminum and brass are non-ferrous metals and cannot be detected using a magnetometer.

A magnetometer is an electronic instrument designed to detect small changes in the Earth's local magnetic field. Over the years different technologies have been used in magnetometers. The Geometrics G-858 Portable Cesium Magnetometer used to collect magnetic data for Pacific Geophysics uses one of the most recent methods to detect magnetic anomalies. A detailed discussion describing the method this unit uses is available at Geometrics.com.

This magnetometer enables the operator to collect data rapidly and continuously rather than the older instruments that collected data at discreet points only. The G-858 is carried by hand across the site. The sensor is carried at waist level. Typically individual data points collected at normal walking speed are about 6" apart along survey lines usually 5 feet apart, depending on the dimensions of the target objects.

It is critical to know the exact location of each data point so that if an anomaly is detected it can be accurately plotted on a magnetic contour map. At most small sites, data are collected along straight, parallel survey lines set up on the site before the data collection stage begins. For very large, complex sites, the G-858 can be connected to a Global Positioning System (GPS) antenna which allows the operator to collect accurately-located data without establishing a survey grid. With GPS, data are collected and positioned wherever the operator walks. A limitation using GPS is that the GPS antenna must have line of sight with the GPS satellites. Data can be mislocated if the GPS antenna is under trees or near tall buildings.

Data are stored in the unit's memory for later downloading and processing. A magnetic contour map of the data is plotted in the field. Geographical features are plotted on the map. Magnetic anomalies appearing to be caused by objects of interest are then investigated on the site using several small hand-held metal detectors. If an object appears to be a possible object of interest, it may be investigated with GPR.

Magnetic contour maps may be printed in color in order to highlight anomalies caused by ferrous objects located under the magnetic sensor. Usually, ferrous objects situated below the sensor produce magnetic "highs" and anomalies located above the sensor produce magnetic "lows". Magnetic highs are of interest to the operator since most objects of interest are located underground.

Depending on the orientation, shape and mass of a metallic object, a high/low pair of magnetic anomalies may be present. In the northern hemisphere the magnetic low is located north of the object and the magnetic high toward the south. The object producing the anomaly is located part way between the high and the low anomalies.

Magnetometer surveys have limitations. Magnetometers only detect objects made of ferrous (iron-containing) metal. Large ferrous objects (buildings, cars, fences, etc.) within several feet of the magnetometer create interference that may hide the anomaly produced by a nearby object of interest.

Ground Penetrating Radar

A Geophysical Survey Systems, Inc. (GSSI) SIR-2000 GPR system coupled to GSSI antennas of various central frequencies is used to obtain the radar data for our surveys.

GPR antennas both transmit and receive electromagnetic energy. EM energy is transmitted into the material the antenna passes over. A portion of that energy is reflected back to the antenna and amplified. Reflections are displayed in real-time in a continuous cross section. Reflections are produced where there is a sufficient electrical contrast between two materials. Changes in the electrical properties (namely the dielectric constant) that produce radar reflections are caused by changes in the moisture content, porosity, mineralogy, and texture of the material. Metallic objects of interest exhibit a strong electrical contrast with the surrounding material and thus produce relatively strong reflections. Non-metallic objects of interest (septic tanks, cesspools, dry wells, and PVC and clay tile pipes) are not always good reflectors.

Radar data are ambiguous. It can be difficult to distinguish the reflection produced by an object of interest from the reflection caused by some natural feature. Rocks or tree roots have reflections that appear similar to reflections from pipes. In concrete investigations reflections produced by metal rebar look exactly like those from electrical conduit or post-tension cables. Objects with too small an electrical contrast may produce no reflections at all and may be missed. Target objects buried below objects with contrasting properties that also produce reflections may be missed (e.g. USTs below roots, concrete pieces, pipes or rocks). If an object of interest like a UST is buried below the depth of penetration of the radar signal, it will be missed.

In addition to interpreting ambiguous data, radar has several limitations that cannot be controlled by the operator. The radar signal is severely attenuated by electrically conductive material, including wet, clay-rich soil and reinforced concrete. The quality of the data is affected by the surface conditions over which the antenna is pulled. Ideally the antenna should rest firmly on a smooth surface. Rough terrain and tall grass reduce the quality of radar data.

It is the job of an experienced interpreter to examine the GPR profiles and deduce if reflections are from objects of interest. A GPR interpreter cannot see underground, but can only interpret reflections based on experience.

The only way to truly identify an object is to excavate.

Hand-held Metal detectors

Two small, non-recording metal detectors are used to locate suspect magnetic anomalies detected using the G-858 Magnetometer in order to determine the likely cause of the anomaly. First, the magnetic contour map and a Schonstedt Magnetic Gradiometer are used to locate the center of the magnetic anomalies.

Once the anomaly is located an Aqua-Tronics Tracer is used to determine if the object producing the anomaly is a possible object of interest. Most anomalies are at least in part produced by features observed on the ground surface.

Schonstedt Magnetic Gradiometer: This magnetometer has two magnetic sensors separated vertically by 10". The magnetic field surrounding a ferrous object is strongest near the object and decreases rapidly as the distance increases. If the magnitude measured by the sensor located in the tip of the Schonstedt is very high, and the magnetic field measured by the sensor located farther up the shaft of the Schonstedt is low, there is a large vertical magnetic gradient and the instrument responds with a loud whistle indicating the object is near the surface. If there is a small difference in the magnitudes measured by the two sensors, the object is deeper. The instrument responds with a softer tone. A discussion of this instrument is available at Schonstedt.com.

Aqua-Tronics A-6 Tracer: The Aqua-Tronics A-6 Tracer uses a different method of detecting metallic objects. This instrument measures the electrical conductivity of a metal object. It is capable of detecting any electrically conductive metal, including non-ferrous aluminum and brass. The Tracer is capable of detecting three-dimensional objects as well as pipes.

The Tracer consists of a transmitter coil and a receiver coil. In the absence of any electrically conductive material in the vicinity of the Tracer, the electromagnetic field around each coil is balanced.

Basically the electromagnetic field produced by the transmitter induces an electric current into the area surrounding the instrument. Nearby conductive objects distort the EM field. The balance between the two coils is disturbed and the instrument produces an audible tone and meter indication.

Radio Detection RD8000 PDL pipe and cable detector: This instrument may be used to detect buried, conductive pipes and utilities. It consists of a transmitter and a receiver and can be used in two configurations.

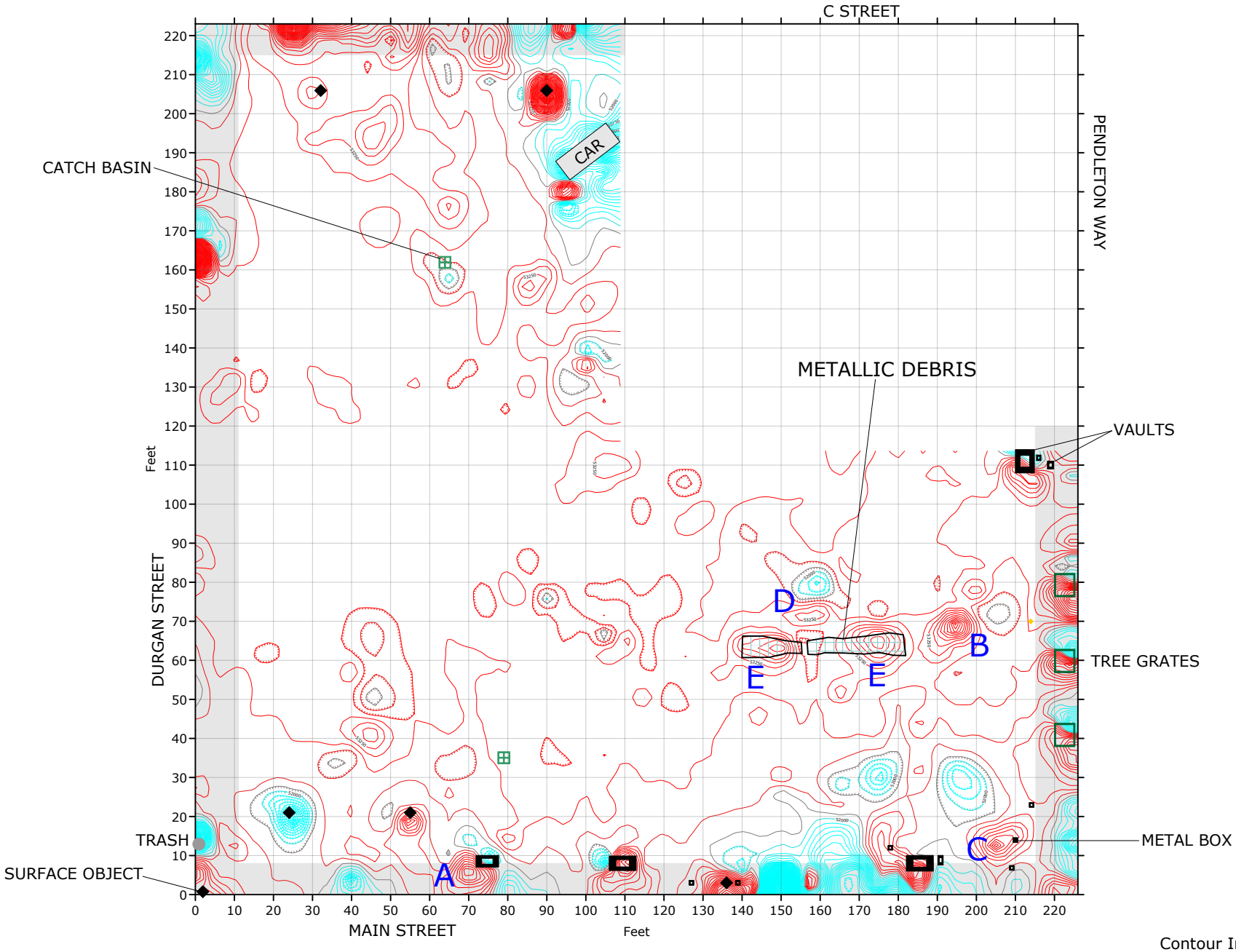
The transmitter may be used to directly apply a small electrical current to exposed, electrically conductive pipes and utilities. The RD receiver is then able to "trace" the underground portion of the pipe or utility, under some conditions for several hundred feet. The transmitter can also induce an electrical current into buried pipes and utilities where direct contact is not available.

The receiver can also be used alone. It has the capability to locate pipes and utilities by detecting the very small electrical currents induced into the features by nearby AM/FM radio stations.

The receiver also has an AC power function that may be used to detect underground power lines.

PACIFIC GEOPHYSICS

FIGURE 1	Site Location Drone Photo	
	Project: 200125	Vacant Lot Main Street and Durgan Street Washougal, Washington
	Drawn by : NT	Prepared for: PBS Environmental
		Survey Date: 2/11/2020



Contour Interval: 250 nT

PACIFIC GEOPHYSICS

FIGURE	Magnetic Contour Map	
2	Project: 200125	Vacant Lot Main Street and Durgan Street Washougal, Washington
	Drawn by : NT	Prepared for: PBS Environmental
		Survey Date: 2/11/2020

Appendix B
Photo Documentation

Photo 1. Boring SB-2 – collecting the soil-gas sample. Photo taken facing west.

Photo 2. Boring SB-2 – picture of the shroud setup for collecting the soil-gas sample. Photo taken facing west.

Appendix C

Standard Operating Procedures

Drilling and Soil Sampling
Sampling Groundwater Monitoring Wells

STANDARD OPERATING PROCEDURE
Drilling and Soil Sampling Procedures

1 PURPOSE

This Standard Operating Procedure (SOP) provides an overview of mobile drilling methods typically used during environmental investigations along with associated health and safety issues. This document outlines procedures to be followed by PBS personnel during drilling and soil sampling activities. Groundwater and soil gas sample collection through the use of drill rigs are covered under separate SOPs.

2 TYPES OF DRILL RIGS

There are three types of drilling methods that are typically used for environmental investigations: direct push, auger, and sonic. Each type of drilling method is described below. A fourth option, discussed in Section 2.4, is a hand auger tool.

2.1 Direct-Push Drilling

Direct-push drilling methods are a common drilling technology used in environmental investigations due to the small diameter borehole (two and one-quarter inch (2.25")) that generates significantly less investigation-derived waste (IDW). The rigs are hydraulically powered, and use static and percussion force to advance the drill rods. Limited access rigs are available for interior locations while track-mounted rigs allow for sampling in locations with unimproved roads.

The rods are equipped with disposable plastic liners that contain the soil retrieved for observation and sampling. The entire column of rods is removed from the ground each time to retrieve soil for sampling. The rod lengths can be 3, 4, or 5 feet. Because of this, if caving or excessive slough is a concern, the borehole may be temporarily cased to keep it clear and open during soil sample retrieval.

2.2 Hollow Stem Auger Drilling (HSA)

Hollow stem auger drilling methods use hollow corkscrew drilling flights to advance into the subsurface. The borehole is typically 11 inches in diameter, with the flights having a 6-inch inner diameter space in which to retrieve samples or construct wells. The hollow stem auger drill rigs have better capability to penetrate higher density deposits that the direct push probe method. Some direct-push rigs have the capacity to drill with hollow stem auger flights, but these rigs typically do not have the mechanical power to drill through challenging soil. The use of auger drill rigs for environmental investigations is typically for the installation and decommissioning of monitoring wells.

Soil sampling with an auger drill rig is conducted through the use of split spoon samplers or Shelby tubes deployed through the inner hollow space. Split spoon samplers are typically 2.5 feet in length and advanced by hammer weight blow into the undisturbed soil. Shelby tubes are typically used in soft deposits such as clays. Soil brought to the surface on the exterior of drilling flights is considered drill or soil cuttings. Soil samples should not be collected and analyzed from the cuttings because that soil may have come in contact with other soil or contamination from varying depths.

2.3 Rotosonic Drilling

Rotosonic drilling methods (hereafter referenced as sonic method) advance drill rod flights into the ground through the use of vibration, and full-size sonic rigs can advance rods through very challenging unconsolidated geologic formations including large cobbles. The borehole size varies but typically is 4 to 6 inches in diameter.

Due to the nature of the drilling technology, the soil can be disturbed by the vibrations, so consistency and compaction are unreliable. Soil is vibrated out of the lead flight into plastic bags for observation and sampling. The entire column of rods is removed from the ground each time to retrieve soil for sampling; if caving or excessive slough is a concern, the borehole may be temporarily cased to keep it clear during soil sample retrieval.

2.4 Hand Auger Tool

A fourth drilling option is the use of a hand auger tool, sometimes called a handheld auger. This tool, made of steel, is used to bore a hole in soil or sediments. It is intended for use only by hand and is powered by human force by twisting or screwing the tool into the soil. The soil is retrieved through a short barrel that attaches to the base of the auger rods. This tool is used for sites where the soil is relatively easy to penetrate, and when sampling is limited to the upper 5 to 10 feet of the shallow surface. Different barrels are available for coarse-grained or fine-grained material.

3 HEALTH AND SAFETY PLAN

A Health and Safety Plan (HASP) must be developed prior to fieldwork commencing. Typically, a site-specific HASP is prepared from a PBS template for drilling investigations. In all cases, pertinent safety information must be relayed to field personnel, including subcontractors, to communicate mandatory elements from the federal code for hazardous waste operations and emergency response (29 CFR 1910.120(b)(4)).

4 UTILITY LOCATES

Utility locates will be completed on all drilling projects including hand-augered sampling. The property owner or site manager should be interviewed regarding the potential location of buried utilities or other subsurface obstructions on the property. The call-in numbers are provided below. Alternately, PBS personnel can obtain log-ins to file locate requests on-line (Internet Ticket Processing, http://www.callbeforeyoudig.org/index.asp).

Oregon Utility Notification Center: 1-800-332-2344
Washington Utility Notification Center: 1-800-424-5555

The Utility Notification Center needs to be contacted at least 48 hours (two business days) in advance to locate utility-owned lines up to the meter (e.g., water, gas, electric), and public utilities within the public right-of-way (e.g., sewer). In addition, a private utility locating company is typically contracted to survey for private utilities such as utility lines from meters to buildings, drain lines, buried electric cables, or irrigation and sprinkler lines.

When filing utility notification requests, PBS personnel should be as specific as possible about where to locate. Washington law requires that the proposed excavation/drilling work areas are field-marked with white paint prior to the locating event.

When beginning a project, PBS personnel must carefully think through where boreholes can be safely drilled, considering both subsurface and overhead obstructions. A site walk may be prudent once the utilities have been marked and prior to the drilling fieldwork. If safe drilling conditions cannot be confirmed, the PBS Project Manager should determine if engineering controls should be implemented, such as shielding or shutting down utility and/or power lines.

SAFETY NOTE: Drill rig masts must be a safe distance from overhead power lines to prevent mast lines and power lines being moved together by wind. Occupational Safety and Health Administration (OSHA) rules for drillers require a minimum distance of 10 feet, with additional spacing required depending on the voltage carried by the power line. The drill rig subcontractor is responsible for ensuring sufficient clearance. However, PBS personnel should verify that potentially unsafe conditions do not exist.

5 SAFETY EQUIPMENT REQUIREMENTS

The following safety equipment is required for all drilling investigations:

- Hard hat
- Hearing protection (ear muffs or plugs, must be worn when drill rig is in operation)
- Safety-toe work boots
- Safety vest
- Gloves (typically disposable)
- Safety goggles or glasses
- Life vests (only when working over water)

6 FIELD EQUIPMENT AND SUPPLIES REQUIREMENTS

The following equipment is typically required for drilling projects when soil sampling will occur. Groundwater or soil gas sampling is discussed in separate SOPs. PBS personnel should confirm that the drilling contractor will provide decontamination water, soap, brushes, and buckets.

General field supplies/equipment includes:

- 5-gallon buckets
- Bags (garbage)
- Bags (plastic zipper-type)
- Camera
- Cellular telephone and phone numbers of client, project laboratory, subcontractors, etc.
- Field notebook or daily log
- Measuring tape
- Paper towels
- Pens
- Spray paint (optional)

Soil sampling supplies/equipment includes:

- Project proposal/scope of work
- Alconox/Liquinox or similar decontamination detergent
- Distilled water (for decontamination)
- Environmental borehole log forms
- Hand auger (if required by scope)
- Ice chest with blue ice or party ice
- Nitrile or other chemically compatible gloves
- Photoionization detector (PID)
- Sample chain-of-custody forms
- Sample containers (ask lab about sample volume, preservatives, etc.)
- Sampling spade or spoons (if required by scope)

7 PRE-DRILLING ACTIVITIES

The following tasks must be performed before beginning work:

- Conduct tailgate safety meeting with all field personnel, including visitors such as the client or regulator; review Health and Safety Plan.
- Install traffic cones/barrier tape or other barrier to control pedestrian and vehicle access to work area as necessary.

The drilling subcontractor is responsible to ensure that the area on which the rig is to be positioned is cleared of removable obstacles and the rig should be leveled if parked on a sloped surface. The cleared/leveled area should be large enough to accommodate the rig and supplies. PBS personnel must confirm that the work area is cleared and safe for work prior to initiating drilling activities.

8 SOIL SAMPLING PROCEDURES

8.1 Logging and Field Screening Soil

Upon retrieval of the soil, describe as per the Geo-Environmental Field Classification chart for soil (included as an attachment). Record observations on an environmental borehole log.

If conducting head-space screening with a PID, remove one-quarter to one-half cup of soil and place in a sealable plastic bag. Seal the bag, break up the soil, and let sit for a minimum of five minutes (in colder weather, either wait for 15 to 30 minutes or put into a warm car or room). The purpose of the headspace screening is to measure what is off-gassing from the sample, and sufficient time must be allowed for that to occur. After the appropriate interval, place the end of the PID probe into the bag (through a small opening in the "zipper") and record the peak value.

If performing sheen testing, place a small sample volume (preferably darker or stained material) in a bowl partially filled with water and observe sheen indicative of petroleum contamination.

8.2 Collecting Soil Samples for Laboratory Analysis

Prior to collecting a sample for laboratory analysis, the sampler should don new gloves. If there are multiple samples to be collected from a single borehole, the gloves should be replaced to avoid cross-contamination.

Collect soil samples using a gloved hand or a clean sampling tool and place directly into the sample jar(s). For volatile organic compounds (VOCs), pack the soil to minimize jar headspace, or field preserve for VOCs using EPA Method 5035 (the field kit is obtained from the laboratory). Label samples as described under Section 8.3 Sample Numbering. Place labeled sample container(s) in the cooler with ice.

8.3 Sample Identification

Sample labels will be completed and attached to the jars in the field to prevent misidentification. All sample labels will include the following information:

- Project name or number
- Sample identification
- Sample collection date and time

The sample identification is unique to a particular sample and the format must be consistently used for all samples collected at the site. The sample identification typically includes the sample location and the collection depth. The sample location is the soil boring number or otherwise designated sample location. Standard abbreviations for sample location types are:

- DP = Direct push
- MW = Monitoring well
- SB = Soil boring
- SE = Sediment
- SO = Surface soil
- SS = Soil sample
- TP = Test pit
- WP = Well point

Examples of sample identifications are: DP-5 (4'), SS-22 (1'), and MW-3 (15')

Other naming conventions may be used, as long as the labeling is consistent and each location is clearly identifiable.

9 BOREHOLE ABANDONMENT

The licensed driller is responsible for abandoning boreholes in compliance with state regulations. PBS personnel should ensure that this occurs, and that the sealing material (typically bentonite chips) is sufficiently hydrated for a proper seal. State regulations governing this are:

- Oregon Administration Rule (OAR) 690-240
- Washington Administrative Code (WAC) 173-160

10 DECONTAMINATION PROCEDURES

Minimizing the possibility of cross-contamination between samples is a critical component of a successful soil sampling project. This is achieved by consistent and thorough decontamination of sampling equipment, such as drill rods, sampling devices (split spoons, trowels, etc.), and other tools that may come in contact with soil to be sampled.

For drilling equipment, the drilling contractor is responsible for the decontamination procedures. Typically, a pressure washer with hot water or water with added detergent is used to clean drill rods and other equipment. The use of a steam cleaner is not appropriate because of the risk of burns, and steam cleaners do a poor job of removing soil particles from equipment.

For equipment and supplies used by PBS personnel, water with added detergent is typically used for decontamination. Alternately, disposable supplies, such as gloves and sampling scoops, can be used to avoid having to decontaminate them.

PBS field personnel should work with the PBS Project Manager to confirm the appropriate decontamination procedure for each project. For example, it may be important to know the source of the driller's water used for decontamination, and distilled or deionized water may need to be used to clean hand tools.

All water and sludge generated during decontamination will be captured for later disposal. Release of water directly onto the ground or into drains or catch basins is not allowed.

11 INVESTIGATION-DERIVED WASTE

Investigation-derived waste consists of soil cuttings, decontamination water, purge water (if groundwater is encountered), and personal protective equipment (e.g., nitrile gloves, rags, paper towels, Tyvex suits, disposable bailers, and tubing). All disposable personal protective equipment may be disposed of as general refuse unless otherwise instructed by the PBS Project Manager.

Soil cuttings are typically placed in 5-gallon buckets or other appropriate containers during the execution of the fieldwork, and transferred to 55-gallon drums as the project progresses. If appropriate, the cuttings may remain in buckets as long as tight-fitting lids are placed on each bucket. For some projects, the PBS Project Manager may request that decontamination/purge water be placed into the same drums as the soil, instead of keeping the two media separate. Depending on the type of contamination, this may result in cost savings for the client during disposal. Field personnel should confirm how to contain soil and water prior to each field event.

11.1 Drum Labeling

The storage containers must be labeled as hazardous, non-hazardous, or unknown pending laboratory results. The labels must be completed using an indelible marker and include:

- Date that the contents were generated
- Nature of the contents - for example:
    - Drill cuttings
    - Purged groundwater
    - Decontamination water and/or sludge
- Contact phone number in the event emergency response personnel need to identify the contents of the container.

Drums or other storage containers should be placed in as secure a location as possible, which may be a building if the exterior area is not secure from vandalism.

12 POST-DRILLING ACTIVITIES

Upon return to the office, PBS personnel should:

- Clean and calibrate equipment prior to placing back into storage. If there were any operational issues noted, they should be reported immediately to the equipment manager.
- Submit field borehole logs for electronic formatting for future reports.
- Submit the daily field notes to the PBS Project Manager for placement into the project file. If a field notebook was used, and that notebook is not dedicated to that project, a copy of those notebook pages should be submitted.

STANDARD OPERATING PROCEDURE
Sub-Slab Vapor and Soil Gas Sampling

PURPOSE

Vapor intrusion of volatile organic compounds (VOCs) into occupied structures is considered a critical migration pathway requiring assessment at contaminated sites. Specifically, regulators may require property owners to sample soil gas, sub-slab vapor, or indoor air to assess risk to building occupants.

This standard operating procedure (SOP) is intended to guide soil gas or sub-slab vapor sampling efforts when creating temporary sampling points when Method TO-15 or other analytical methods utilizing a Summa canister as the sampling media are required. The sampling points can be modified to produce a permanent sampling location. The sampling protocols for analysis of soil gas or sub-slab vapor by Method TO-17, which utilizes a sorbent tube as the sampling media (instead of a Summa canister), as well as the sampling of indoor air are presented as separate SOPs.

Soil gas and sub-slab vapor sampling is typically conducted based on prior results from other environmental studies, such as soil or groundwater sampling, or if historical uses indicate a human health risk could be present. A variety of issues can significantly affect the results of soil gas and sub-slab vapor sampling. Adherence to this SOP will help ensure that sampling results are valid and reliable. This SOP assumes that samples will be collected in Summa canisters. If other sampling media is used (such as tedlar bags), some of the steps in this SOP may not apply or may need to be modified.

Use one of the following two methods to conduct the sub-slab vapor or soil gas sampling

METHOD 1 – VAPOR PIN

1 EQUIPMENT LIST

The following table lists standard equipment and tools needed for soil gas and sub-slab vapor sampling. When renting a helium meter, ask the vendor for one that is intended for use in leak detection testing (e.g., MGD-2002 multi-gas leak locator). It should have the ability to purge the line quickly (the equipment company may provide a special filter for this), and preferably, a meter with an active pump (as opposed to passive venting). It does not need to be intrinsically safe UNLESS site conditions require this feature.

Equipment to get from lab	• 1 or 6 liter (L) Summa canister. • One extra Summa canister in the event that a canister fails in the field. • Flow regulator (also known as critical orifice) preset by lab for pre-determined sampling time, not to exceed a flow rate of 200 mL/min. • Vacuum gauge (for verifying vacuum prior to sampling, flow regulator may act in this role). • Tubing (new for each sample location). Must be Teflon, Nylaflow, Peek, or stainless tubing. Do NOT use polyethylene tubing. • Chain of custody and identification tags. • T-fitting (need one for each sampling location, including ferrules and hex nuts for each leg of T).

Other equipment	• Purging syringe (calibrated, typically for 50 to 60 milliliters [mL]). • Granular bentonite. • Disposable or washable containers (~16 ounces) for mixing bentonite and/or cement. • Water for mixing bentonite and cement. • Sand. • Silicone tubing. • Helium gas tank with regulator. • Helium meter (make sure that it measures in ppm by volume). • On-off valve (two per sampling location). • Vapor Pin with a silicon sleeve (or similar equipment). • Vapor Pin tool and hammer for installation and removal (or similar equipment). • Vapor Pin drill guide (for permanent installations). • Field notebook and/or field forms. • Helium shroud. • Weight for shroud, if needed. • Nuts and ferrules (if you did not receive from lab). • Cap for "shroud air tubing." • Water dam (e.g., 1.5-inch PVC coupler).
Tools	• Scissors. • Rotohammer/drill for drilling through concrete. • Drill bits (0.625-inch, 1.5-inch). • Crescent wrench (1/2 and 9/16 inch). • Whisk broom/dust pan. • Wet-dry vacuum. • Extra-thin knife/screwdriver. • Extension cord for rotohammer. • Wrench for helium regulator. • Generator (if power is not available)
Supplemental supplies	• Teflon tape (if seal leaks are sustained). • Purging pump with tubing (if purging syringe not used) and charging cord. • Fast setting concrete to patch floor. • Adhesive to repair carpet or tile.

2 LABORATORY

The lab will supply the Summa canisters, flow regulators, gauges, and tubing, and can also provide the purging syringe, if needed. Have the equipment arrive TWO business days prior to sampling, if possible. This allows the lab time to express-mail any additional, broken, or forgotten equipment.

As soon as the shipment is received, ensure that all equipment was provided and verify the vacuum of all Summa canisters. Order an extra gauge, if needed, to check the canisters for pressure prior to leaving the office. Knowing that the canister has sufficient initial vacuum allows for better trouble shooting in the field.

The following information must be provided to the lab to ensure shipment of the correct equipment:

- Size of canister (400 mL, 1 L, 6 L). A 1 L Summa will require a minimum of two times dilution of reporting limits. If this will cause your sample reporting limits to exceed screening criteria, use a larger Summa canister. You MUST know your reporting limits to determine the canister size.
- Type of canister certification (batch vs. individual). Batch certification is usually sufficient for sub-slab vapor and soil gas sampling projects.
- Method reporting limits.
- Tracer gas to be used (the lab must certify container for this prior to shipping). PBS uses Helium as a tracer gas.
- Sample time/flow rate.

Samples should be collected at a rate between 100 and 175 mL per minute (most guidance documents recommend that samples not be collected faster than 200 mL per minute). A flow rate greater than 200 mL/min runs the risk of introducing ambient air dilution to the sample. The sample time for grab samples is calculated by determining an acceptable sample flow rate (perhaps 150 mL/min) and multiplying that by the sample container size. For a 150 mL/min rate, a 1 L Summa canister would require approximately seven minutes. A 6 L Summa canister would require 40 minutes.

3 SUB-SLAB VAPOR INITIAL PROCEDURES

Order equipment as previously identified, and do the following prior to field activities:

- Determine the proposed locations for each sample.
- Confirm with the property owner/occupant that subsurface utilities will not be impacted when drilling through the slab in these locations.
- Conduct a private utility locates for your locations to check for subslab or subgrade obstructions.
- If possible, determine the slab thickness to confirm that a hand-operated drill can drill through it.
- Determine if carpeting or other flooring will need to be removed prior to drilling, or will require patching.
- Have the helium meter arrive the day before sampling.

Once at the site, sampling should occur as described below.

Drill Hole and Seal Tubing

These instructions assume that all samples will be collected using a Vapor Pin or similar equipment.

- Confirm concrete thickness, if possible, so you'll know when to expect the drill bit to break through bottom of slab.
- If the Vapor Pin will be installed for on-going monitoring (i.e., permanent installation), begin by drilling a hole 2 inches into the concrete using the 1.5-inch drill bit. This larger hole will be used to install a flush-mount cover. Then insert the Vapor Pin drill guide into this hole so that the smaller diameter drill hole will be centered. Continue with the directions below.

- Drill a hole through the slab using the 0.625-inch drill bit. Drill 1 to 3 inches into backfill or native material beneath the concrete slab.
- Use a 0.625-inch tube brush to clean concrete dust from the hole.
- Use the whisk broom or vacuum to remove concrete dust or loose material from around the drill hole.
- Install a Vapor Pin with a silicon sleeve (the silicon sleeve provides the seal) into the 0.625-inch drilled hole utilizing a dead weight hammer and the Vapor Pin installation/extraction tool (or similar equipment).
- If not drilling the 1.5-inch hole, place a small amount of hydrated bentonite on the concrete surface around the Vapor Pin and insert a water dam into the bentonite.
- Place a silicon mat with a circular cut-out for the Vapor Pin on the concrete surface around the sample point and water dam.
- Add a small piece of silicone tubing to the top of the Vapor Pin for attaching tubing later.
- Add a small amount of water to the inside of the water dam to ensure a good seal is in place.
- Place the shroud over the sample point and thread 0.25-inch tubing through a stopper in the shroud.
- Place a weight on the shroud to prevent it from being moved and compromising the seal integrity, if needed.

For temporary holes, allow 20 to 30 minutes for the hole to equilibrate. If collecting sub-slab gas samples at multiple locations, consider performing these initial activities at each location prior to continuing with the sampling.

4 SOIL GAS INITIAL PROCEDURES

Order equipment as previously identified. Prior to field activities, the following should occur:

- Determine the locations and depths for each sample.
- Determine if equipment, vehicles, or other stored items will need to be moved prior to the field event.
- Call in a public utility notification.
- Conduct a private utility locates for your locations to check for subgrade utilities/obstructions.
- Arrange for a driller to deploy a Post Run Tubing (PRT) sample system, or equivalent, or arrange with the driller to install a sample point using a hand auger.

Once at the site, sampling should occur as described below.

Drill Hole and Seal Tubing

- Drill a borehole hole using a PRT system, or equivalent. The bottom of the hole should be at least 5.5 feet below ground surface (bgs), as long as this is above the water table.
- Lift up on the drilling rod approximately 6 inches to create a void in the subsurface.
- Insert the PRT fitting to the 0.25-inch tubing and place down the hole. Once it reaches the bottom, screw the fitting onto the PRT sample point (note: the fitting uses left-hand threads).
- Determine the length of 0.25-inch tubing needed to conduct sampling at this location and cut it to that length. Do not forget that there must be enough tubing to go through the helium shroud, connect to the

purging T-valve and connect to the Summa canister. Be sure to cut the ends straight with no burrs or jagged edges.

- Mix bentonite with water for sealing.
- Place bentonite around the rod protruding from the ground.
- Insert bentonite evenly around tubing exiting the drill rod, making sure it penetrates fully into the rod. Thread the other tubing end through the helium shroud/stopper. Cover the loose tubing end with a plastic bag or cap to ensure it remains clean until it is connected to the Summa canister.
- Place the shroud over the drill rod and place more bentonite around the base to seal the shroud to the ground.

Sample Train Assembly

- Place the shroud over the sample point, and thread tubing through the shroud and shroud stopper.
- Place a weight on the shroud to prevent it from being moved and compromising the seal integrity, if needed.
- Attach an on-off valve to the end of the tubing, then place additional tubing on the other side of the valve. Turn the valve off.
- Install a T-fitting and a second on-off valve in-line with the sample tubing to allow for purging. Add tubing from the third leg of the T-fitting to the Summa canister.
- Connect the gauge and flow regulator to the Summa canister and tubing. Do not over tighten the fittings.
- Record the canister and flow regulator serial numbers on the field form.
- Ensure that all connections are tight and all valves are closed.

For temporary holes, wait 20 to 30 minutes to allow the hole to equilibrate. If a hand auger was used to install the sample point you must wait 48 hours.

5 LEAK DETECTION TESTING

Shut-in test and field/laboratory test for helium are two testing methods performed for leak detection.

Shut-in Test

Evaluate the integrity of the sample train by performing a vacuum shut-in test. Remove a sufficient volume of air from the sample train using the purging syringe to provide a vacuum of at least -15 inches of mercury (Hg). Observe the gauge for at least two minutes to detect any decrease in measured vacuum. The vacuum must be maintained for at least two minutes. If the vacuum is not maintained, check the fittings and retest.

Helium Test

At this point, you should have the shroud in place with the tubing from the Vapor Pin or soil gas sample point extending from the shroud, and the inlet hose from the helium tank extending into the shroud. Perform these actions:

- Fill the shroud with helium for several seconds and turn off the tank.
- Using the helium meter (meter), measure and record the helium concentration in the shroud in percent (%) or parts-per-million-volume (ppmv) (1% is equivalent to 10,000 ppmv). The target helium

concentration is 70 to 90%. Remove the meter from the shroud air tubing and cap the tubing. *Allow meter to clear back to zero*.

Sample Train Purging

- Open the on-off valve to the Vapor Pin or PRT sampling point tubing. The Summa canister remains closed.
- Determine the amount of air that requires purging within the sampling tubing.
    - Determine how much tubing you need to purge (round up to whole feet).
    - Multiply the number of feet by the volume of air within one unit foot of tubing (see multipliers below for various tubing sizes).
    - Determine how much you need to purge from the hole drilled through the concrete slab or PRT sampler (usually 6 inch length).
    - Add the tubing and hole purge volumes together.
    - You want to remove a minimum of two purge volumes, so multiply volume calculated by two.

Size of tubing (inches)	Air volume in mL per one unit foot
1/4	9.7
3/8	21.7
1/2	38.6
5/8	60.3
3/4	86.9
1	154.4

- Connect the purging syringe and turn the on-off valve to ON.
- Purge the calculated volume of air. Draw the air slowly through the syringe, approximating the sample collection flow rate, to minimize the effect of creating a vacuum that could compromise the connections or seals. If your sample collection rate is 150 mL/min, and you need to purge 50 mL, then take approximately 20 seconds to purge the 50 mL or as slowly as possible.
- If you need to purge more than one syringe volume, complete the first purge, turn the valve on the syringe to OFF, depress the syringe to purge the air out of the syringe, turn syringe valve to ON and repeat the purging process.
- When done purging, turn the on-off valve to OFF.
- Connect the meter to the sample point tubing (Vapor Pin or PRT) and allow the meter to run for approximately one minute. Measure the helium concentration.
- If elevated readings on the helium meter (greater than 5,000 ppmv [0.5%]) are detected, make adjustments to seals.
- Once all necessary adjustments have been made, record the helium measurement in the shroud on field sheet following adjustment to seals.

Once the leak detection testing has confirmed the Vapor Pin or PRT seal is sufficient, proceed to sample collection.

6 SAMPLE COLLECTION

- Confirm that all connections remain tight and all valves are closed.
- Close the on-off valve connected to the purging syringe.
- Open the Summa canister by turning its valve approximately one-half turn.
- Immediately record the vacuum on the gauge (it should stabilize very quickly) and the time. The gauge should measure approximately -30 inches Hg (please note that some gauges may read greater than -30 inches Hg). If the vacuum is less than -27 inches Hg, the canister may not have sufficient vacuum for sampling. In this case, select another canister. If another canister is not available, call the project manager and ask how they would like you to proceed.
- Allow the Summa canister to fill, keeping in mind the amount of time determined for sample collection (i.e., what you told the lab to set for a flow regulator time)
- At the mid-point of the sample collection, record the helium concentration in the shroud. Add additional helium if shroud concentration is below 50%, and record the new reading.
- The vacuum gauge should never drop below -5 inches Hg. If the vacuum readings are not matching up with the expected sampling time (the gauge is dropping faster or slower than expected), you will need to use your best judgment as to when to stop the sample collection (or call the lab or project manager to discuss).
- Once the sample has been collected, close the canister valve, be sure it is tightly closed (but do not over tighten), and record the vacuum reading and time.
- Record the helium concentration in the shroud.
- Remove the gauge and flow regulator and replace the canister fitting.
- Fill out the chain of custody and return the containers to the lab with the original chain of custody. Retain a copy of the chain of custody for the project files.

When collecting 6 L Summa canister samples, it is recommended that you monitor the vacuum gauge during the entire sample duration, which can take up to 50 minutes. If the gauge should drop below -5 inches Hg, the sample may be considered void; this can be prevented by watching the gauge. If the gauge drops to 0 inches Hg the sample will need to be re-taken using a new canister.

Drill Hole Abandonment

Once soil gas sampling is completed, the boring will be abandoned by the licensed drilling subcontractor who completed the borehole following applicable state requirements.

Once sub-slab vapor sampling is completed, the following should occur:

- Remove the water from the water dam.
- Clean out the remaining bentonite, cleaning as much as possible from the floor.
- If the sampling location is for one-time use, deploy the Vapor Pin extraction tool to remove the pin.
- Add a small amount of sand to fill the drill hole approximately 1 to 2 inches below the concrete surface (approximately 1 to 2 inches below the bottom of the "seat"). Do NOT overfill with sand as this may compromise your patch.

- Use the whisk broom to remove any loose material at the surface.
- Fill the upper 1 to 2 inches with a quick setting cement grout. Smooth or feather the surface to help create a bond between the slab and the grout.

If the Vapor Pin or similar equipment is for a permanent installation, the following should occur:

- Place a white cap over the tip of the Vapor Pin.
- Install a permanent cover over the capped Vapor Pin (plastic or metal).

7 POST FIELD ACTIVITIES

- Retain all paperwork provided by the lab, including the packing list and certifications. This information must be retained in the permanent project file.
- Decontaminate reusable fittings owned by PBS following the *Standard Operating Procedure for Vapor Pin Decontamination for Vapor Intrusion Assessments*. This includes the Vapor Pin drill guide and any brushes or other tools used for cleaning.
- Return all rental equipment.

Confirming Helium Detections Meet Regulatory Requirements

- Calculate average helium concentration in shroud by taking two or more readings before, during, and after sampling (be sure that meter is reading in ppm by volume).
- When lab results are received, if helium is detected, use this formula to confirm level of leakage:

  Level of leakage = lab-detected concentration / shroud concentration
- Be sure you are using the same units (ppm may not always equal ppmv – check your units).
- Some regulatory guidance documents allow up to 5 to 10% helium within a sample. Be sure to check your state's guidance for allowable levels. Oregon and Washington both allow up to 5% helium for a valid sample.

METHOD 2 – SEALED TUBING

1 EQUIPMENT LIST

The following table lists standard equipment and tools needed for soil or sub-slab gas sampling. When renting a helium meter, ask the vendor for one that is intended for use in leak detection testing. It should have the ability to purge line quickly (the equipment company may provide a special filter for this) and preferably, a meter with an active pump (as opposed to passive venting). It does not need to be intrinsically safe UNLESS site conditions require this feature.

Equipment to get from lab	• 1 or 6 liter (L) Summa canister. • One extra Summa canister in the event that a canister fails in the field. • Flow regulator (also known as critical orifice) preset by lab for pre-determined sampling time. • Vacuum gauge (for verifying vacuum prior to sampling). • Tubing (new for each sample location). Must be Teflon, Nylaflow, Peek, or stainless

	tubing. Do NOT use polyethylene, silicone, or any other type. • Chain of custody and identification tags. • T-valve (need one for each sampling location, including ferrels and hex nuts for each end of T).
Other equipment	• Purging syringe (calibrated, typically for 50 to 60 milliliters [mL]). • Granular bentonite. • Disposable or washable containers (~16 ounces) for mixing bentonite and/or cement. • Water for mixing bentonite and cement. • Sand. • Silicone tubing. • Weight for shroud. • Helium gas with regulator. • Helium meter (make sure that it measures in ppm by volume). • On-off valve (two per sampling location). • Vapor Pin with a silicon sleeve (or similar equipment). • Vapor Pin tool and hammer for installation and removal (or similar equipment). • Field notebook or field forms. • Helium shroud. • Nuts and ferrels (if you did not receive from lab). • Cap for "shroud air tubing." • Water dam (1.5-inch PVC coupler).
Tools	• Scissors. • Rotohammer/drill for drilling through concrete. • Drill bits (0.625-inch, 1.5-inch). • Crescent wrench (9/16 inch). • Whisk broom/dust pan. • Wet-dry vacuum. • Extra-thin knife/screwdriver. • Extension cord for rotohammer. • Plumber's wrench for helium regulator.
Supplemental supplies	• Teflon tape (if seal leaks are sustained). • Purging pump with tubing (if purging syringe not used) and charging cord.

2 LABORATORY

The lab will supply the Summa canisters, flow regulators, gauges, and tubing, and can also provide the purging syringe, if needed. Have the equipment arrive TWO business days prior to sampling, if possible. This allows the lab time to express-ship any additional or forgotten equipment.

As soon as the shipment is received, ensure that all equipment was provided and verify the vacuum of all Summa canisters. Order an extra gauge, if needed, to check the canisters for pressure prior to leaving the office. Knowing that the canister has sufficient initial vacuum allows for better trouble shooting in the field.

The following information must be provided to the lab to ensure shipment of the correct equipment.

- Size of canister (400 mL, 1 L, 6 L). A 1 L Summa will require a minimum of two times dilution of reporting limits. If this will cause your sample reporting limits to exceed screening criteria, use a larger Summa canister. You MUST know your reporting limits to determine the canister size.
- Type of canister certification (batch vs individual). Batch certification is usually sufficient for sub-slab or soil gas sampling projects.
- Method reporting limits.
- Tracer gas to be used (the lab must certify container for this prior to shipping).
- Sample time.

Samples should be collected at a rate between 100 and 175 milliliters (mL) per minute (most guidance documents recommend that samples not be collected faster than 200 mL per minute). A flow rate greater than 200 mL/min runs the risk of introducing ambient air dilution to the sample. The sample time for grab samples is calculated by determining an acceptable sample flow rate (perhaps 150 mL per minute) and multiplying that by the sample container size. For a 150 mL per minute rate, a 1 L Summa canister would require approximately seven minutes. A 6 L Summa canister would require 40 minutes.

3 SUB-SLAB GAS INITIAL PROCEDURES

Order equipment as previously identified, and do the following prior to field activities:

- Determine the proposed locations for each sample.
- Confirm with the property owner/occupant that subsurface utilities will not be impacted when drilling through the slab in these locations.
- Conduct a private utility locates for your locations to check for sub-slab or sub-grade obstructions.
- If possible, determine the slab thickness to confirm that a hand-operated drill can drill through it.
- Determine if carpeting or other flooring will need to be removed prior to drilling, or will require patching.
- Get the lab equipment delivered two days prior to sampling and ensure that all equipment was provided.

Once at the site, sampling should occur as described below.

Drill Hole and Seal Tubing

- Confirm concrete thickness, if possible, so you'll know when to expect the drill bit to break through the bottom of slab.

- Drill a hole using the 0.25-inch or 0.5-inch drill bit. Drill approximately two inches into slab backfill or native material beneath the concrete slab.
- Using a 0.5-inch or 0.75-inch drill bit, overdrill the hole by approximately one inch to create a "seat" for sealing the tubing. The drill bit used for overdrilling should be one size larger than the original hole (0.5-inch for a 0.25-inch initial hole, etc.).
- Use the whisk broom to remove concrete dust or loose material from around the drill hole.
- Test the 0.25-inch tubing to ensure it can be pushed completely down the hole. Once it reaches the bottom, keep track of that tubing length as you pull it back out. Ensure there is no material stuck in the bottom of the tubing (if there is, cut the tubing end off and repeat this step). Re-insert the tubing so that the bottom rests approximately one inch from the drilled bottom, making sure it is below the bottom of the slab. If the tubing rests at the bottom of the hole that is okay.
- Determine the length of 0.25-inch tubing needed to conduct sampling at this location and cut it to that length. Do not forget that there must be enough tubing to go through helium shroud, connect to the purging T-valve and connect to the Summa canister. Be sure to cut the ends straight with no burrs or jagged edges.
- Thread the other tubing end through the helium shroud/stopper, leaving enough tubing within the shroud to allow you to install the sealing material. Cover the loose tubing end with a plastic bag to ensure it remains clean until it is connected to the Summa canister.
- Mix bentonite to an appropriate consistency for sealing.
- Insert bentonite evenly around tubing, making sure it penetrates fully into the larger drill hole. Push down with fingers or appropriate tool to ensure a good seal. Take care not to scrape or puncture the tubing.
- At the surface, mound the bentonite against the tubing and smooth away from it to create a tight seal. It is appropriate to moisten the top of the bentonite mound to aid in creating a good seal.

For temporary holes, allow approximately 20 to 30 minutes for the bentonite to seal and the hole to equilibrate. If collecting sub-slab gas samples at multiple locations, consider performing these initial activities at each location prior to continuing with the sampling.

4 SOIL GAS INITIAL PROCEDURES

Order equipment as previously identified. Prior to field activities, the following should occur:

- Determine the locations and depths for each sample.
- Determine if equipment, vehicles, or other stored items will need to be moved prior to the field event.
- Arrange for a utility locate.
- Arrange for a driller to deploy a Post Run Tubing (PRT) sample system, or equivalent.

Once at the site, sampling should occur as described below.

Drill Hole and Seal Tubing

- Drill a hole using a PRT system, or equivalent. The bottom of the hole should be at least 5.5 feet below ground surface (bgs).
- Lift up on the drilling rod approximately 6 inches to create a void in the subsurface.
- Insert the screw on end to the 0.25-inch tubing and place down the hole. Once it reaches the bottom, screw the fitting onto the PRT sample point (note: the fitting uses left-hand threads).

- Determine the length of 0.25-inch tubing needed to conduct sampling at this location and cut it to that length. Do not forget that there must be enough tubing to go through the helium shroud, connect to the purging T-valve, and connect to the Summa canister. Be sure to cut the ends straight with no burrs or jagged edges.
- Mix bentonite to appropriate thickness for sealing.
- Insert bentonite evenly around tubing exiting the drill rod, making sure it penetrates fully into the rod. Thread the other tubing end through the helium shroud/stopper. Cover the loose tubing end with a plastic bag to ensure it remains clean until it is connected to the Summa canister.
- Place the shroud over the drill rod and place more bentonite around the base to seal the shroud to the ground.

For temporary holes, allow approximately 20 to 30 minutes for the bentonite to seal and the hole to equilibrate.

5 LEAK DETECTION TESTING

In order to perform the leak detection testing, have the shroud in place with the following setup and procedure:

- Tubing from drill hole.
- Tubing for measuring air within shroud (attach tubing onto appropriate fitting if not attached previously).
- Inlet hose from helium tank.
- If needed, place a brick or other weight on the shroud to prevent it from being moved and compromising the seal integrity.
- Fill the shroud with helium for several seconds and turn off the tank.
- Using the helium meter (meter), measure and record the helium concentration through the shroud air tubing in parts-per-million-volume (ppmv) (or know how to readily convert the reading to ppmv). The target helium concentration is 70 to 90 percent. Remove the meter from the shroud air tubing and cap the tubing. Allow meter to clear back to zero.
- Remove the helium tubing from the shroud and put a cap on the brass air fitting immediately.
- Connect the meter to the drill hole tubing and allow the meter to run for approximately a minute. Measure the helium concentration.
- Spray helium around fittings (T, on-off valve and flow regulator connections to Summa canister) and use the helium meter to monitor if any leaks are associated with these fittings.
- If indicated by elevated readings on the helium meter, make adjustments to seals.
- Once all necessary adjustments have been made, record the helium measurement in the shroud on field sheet following adjustment to seals.

Once the leak detection testing has confirmed the drill-hole seal is sufficient, proceed to sample collection.

6 SAMPLE COLLECTION

Sample Train Assembly and Purging

- Install the T-valve and on-off switch in-line with the sample tubing to allow for purging.
- Connect the gauge and flow regulator to the Summa canister and tubing. Do not overtighten the fittings.

- Record the can and flow regulator serial numbers on the field form.
- Ensure that all connections are tight and all valves are closed.
- Determine the amount of air that requires purging within the sampling tubing.
    - Determine how much tubing you need to purge (round up to whole feet).
    - Multiply the number of feet by the volume of air within one unit foot of tubing (see multipliers below for various tubing sizes).
    - You want to remove a minimum of two purge volumes, so multiply volume calculated by two.

Size of tubing (inches)	Air volume in mL per one unit foot
1/4	9.7
3/8	21.7
1/2	38.6
5/8	60.3
3/4	86.9
1	154.4

- Connect the purging syringe and turn the on-off switch to ON.
- Purge the calculated volume of air. Draw the air slowly through the syringe to minimize the effect of creating a vacuum that could compromise the connections or seals. If your sample collection rate is 150 mL per minute, and you need to purge 50 mL, then take approximately 20 seconds to purge the 50 mL or as slowly as possible.
- If you need to purge more than one syringe volume, complete the first purge, turn the switch on the syringe to OFF, depress the syringe to purge the air out of the syringe, turn syringe valve to ON and repeat the purging process.
- When done purging, turn the on-off switch to OFF.

Sample Collection

- Confirm that all connections remain tight and all valves are closed.
- Open the Summa canister by turning its valve approximately one-half turn.
- Immediately record the vacuum on the gauge (it should stabilize very quickly) and the time. The gauge should measure approximately -30 inches mercury (Hg). If the reading is not close to this value, the canister may not have sufficient vacuum for sampling. In this case, call the lab or select another canister.
- Allow the Summa canister to fill, keeping in mind the amount of time determined for sample collection (i.e., what you told the lab to set for a flow regulator time).
- The vacuum gauge should not drop below 3 inches Hg. If the vacuum readings are not keeping pace with the expected sampling time (either the gauge is dropping faster or slower than expected), you will need to use your best judgment as to when to stop the sample collection (or call the lab or project manager to discuss).
- Once the sample has been collected, record the vacuum reading and time.

- Close the canister valve. Be sure it is tightly closed (do not overtighten).
- Remove the gauge and flow regulator and replace the canister fitting.
- Fill out the chain of custody and return the containers to the lab with the original chain of custody. Retain a copy of the chain of custody for the project files.

When collecting 6L Summa canister samples, it is recommended that you watch the vacuum gauge the entire time (which can be up to 50 minutes). If the gauge should drop below 3 inches Hg, the sample may be considered void; this can be prevented by watching the gauge during sampling. If the gauge drops to 0 inches Hg the sample will need to be re-taken using a new canister.

Drill Hole Abandonment

Once sampling is completed at a sub-slab gas location, the following should occur:

- Clean out the remaining bentonite, scraping as much as possible from the drill hole "seat" and sidewalls (do not push down hole but instead place in bag for disposal).
- Add a small amount of sand to fill the drill hole to approximately two inches below the concrete surface (approximately two inches below the bottom of the "seat"). Do NOT overfill with sand as it may compromise your seal.
- Use the whisk broom to remove any loose material at the surface.
- Fill the upper three inches with a quick setting cement grout. Smooth or feather the surface to help create a bond between the slab and the grout.

For soil gas sampling locations, the drill rig operator should abandon the sample point as required by state regulations (Oregon Administrative Rule 690-240 or Washington Administrative Code 173-160).

POST FIELD ACTIVITIES

Retain all paperwork provided by the lab, including the packing list and certifications. This information must be retained in the permanent project file.

Reusable fittings owned by PBS must be decontaminated following PBS' *Standard Operating Procedure for On-Off Valve Decontamination for Vapor Intrusion Assessments*.

ASSESSING LEAK DETECTION RESULTS

Regulatory guidance in Oregon and Washington allow up to 5 percent helium within a sample. To confirm that helium detections meet this regulatory requirement, the following will occur:

- Calculate average helium concentration in shroud ("shroud concentration") by taking two or more readings before and after sampling (the measurements should have been recorded in ppmv).
- When we receive lab results, if helium is detected, use this formula to confirm level of leakage.

  Level of leakage = lab-detected concentration / shroud concentration
- Be sure you are using the same units (ppm may not always equal ppmv: check your units).

Appendix D
Boring Logs

PBS

WASHOUGAL PHASE II ESA
WASHOUGAL, WASHINGTON

PBS PROJECT NUMBER:
24061.001

BORING SB-1

BORING SB-1 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose black, asphalt fill, dry		0.2				No odor or sheen throughout boring
		Loose grey gravel (GM); angular rock fragments, coarse gravel; dry		0.2				
2.0		Soft brown SILT, (ML); low plasticity; moist		0.1	SB-1		75	
4.0				0.1				
		Loose light grey GRAVEL interbedded with brown/orange silt (GM); coarse angular gravel; dry		0.1				
6.0				0.1				
				0.2			75	
8.0				0.1				
				0.2				
10.0								
12.0								
14.0								

BORING METHOD: Direct Push
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: S. Brooks
COMPLETED: 3/19/20

BORING LOG-ENV CORE 24061.001 SB1-4 20200429.GPJ DATATMPL.GDT PRINT DATE: 4/30/20:SB

PBS

WASHOUGAL PHASE II ESA
WASHOUGAL, WASHINGTON

PBS PROJECT NUMBER:
24061.001

BORING SB-2

BORING SB-2 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose black, asphalt fill, dry		0.5				No odor or sheen throughout boring
		Dense grey GRAVEL (GM) with silt; coarse, angular gravel; dry		0.5				
2.0					SB-2		60	
				0.3				
4.0				0.4				
6.0				0.1				
				0.2			70	
8.0				0.2				
				0.3				
10.0								
12.0								
14.0								

BORING METHOD: Direct Push
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: S. Brooks
COMPLETED: 3/19/20

BORING LOG-ENV CORE 24061.001 SB1-4 20200429.GPJ DATATMPL.GDT PRINT DATE: 4/30/20:SB

PBS

WASHOUGAL PHASE II ESA
WASHOUGAL, WASHINGTON

PBS PROJECT NUMBER:
24061.001

BORING SB-3

BORING SB-3 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose, black, asphalt fill, dry		0.5				No odor or sheen throughout boring
2.0		Soft brown SILT (ML) with gravel; medium plasticity; coarse gravel; damp		0.3	SB-3		60	
4.0				0.1				
6.0		Medium stiff grey with orange mottling sandy SILT (ML) with gravel; low plasticity; medium grained sand, sub rounded coarse gravel; damp		0.3				
8.0				0.4			90	
10.0				0.2				
12.0				0.2				
14.0								

BORING METHOD: Direct Push
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: S. Brooks
COMPLETED: 3/19/20

BORING LOG-ENV CORE 24061.001 SB1-4 20200429.GPJ DATATMPL.GDT PRINT DATE: 4/30/20:SB

PBS	WASHOUGAL PHASE II ESA WASHOUGAL, WASHINGTON	**BORING SB-4**
	PBS PROJECT NUMBER: 24061.001	BORING SB-4 LOCATION: (See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose, black, asphalt fill, dry						No odor or sheen throughout boring
		Dense grey GRAVEL (GM) with silt; no plasticity, coarse sub rounded gravel; dry		0.5				
2.0					SB-4		40	
4.0								
		Loose, brown SILT (ML); medium plasticity; moist		0.1				
6.0								
		Dense grey GRAVEL (GM) with silt; no plasticity, coarse sub rounded gravel; moist		0.2			70	
8.0				0.2				
				0.3				
10.0								
12.0								
14.0								

BORING METHOD: Direct Push
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: S. Brooks
COMPLETED: 3/19/20

BORING LOG-ENV CORE 24061.001 SB1-4 20200429.GPJ DATATMPL.GDT PRINT DATE: 4/30/20:SB

PBS

WASHOUGAL PHASE II ESA
WASHOUGAL, WASHINGTON

PBS PROJECT NUMBER:
24061.001

BORING SB-5

BORING SB-5 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose black, asphalt fill, dry						No odor or sheen throughout boring
		Dense grey GRAVEL (GM) with silt; no plasticity, coarse sub rounded gravel; dry		0.5				
				0.2				
2.0		Loose brown SILT (ML); medium plasticity; moist		0.2	SB-5		40	
				0.3				
4.0				0.2				
				0.2				
6.0								
		Loose grey GRAVEL (GP); coarse angular gravel; dry		0.2			70	
8.0				0.2				
		Loose brown GRAVEL (GM) with silt; coarse angular gravel; dry		0.1				
10.0								
12.0								
14.0								

BORING METHOD: Direct Push
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: S. Brooks
COMPLETED: 3/19/20

BORING LOG-ENV CORE 24061.001 SB1-4 20200429.GPJ DATATMPL.GDT PRINT DATE: 4/30/20:SB

PBS

WASHOUGAL PHASE II ESA
WASHOUGAL, WASHINGTON

PBS PROJECT NUMBER:
24061.001

BORING SB-6

BORING SB-6 LOCATION:
(See Site Plan)

DEPTH FEET	MATERIAL DESCRIPTION	PID (PPM)	SAMPLE NUMBER	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0	Loose black, asphalt fill, dry				No odor or sheen throughout boring
	Soft brown SILT (ML); medium plasticity; moist	0.5			
2.0			SB-6	40	
	Dense light grey GRAVEL (GM) with brown silt; no plasticity, coarse angular gravel; dry				
4.0					
	Soft light grey with orange mottling sandy SILT (ML) with gravel low plasticity, fine sand, fine sub rounded gravel; dry				
6.0		0.1			
		0.2		70	
8.0		0.2			
		0.3			
10.0					
12.0					
14.0					

BORING METHOD: Direct Push
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: S. Brooks
COMPLETED: 3/19/20

BORING LOG-ENV CORE 24061.001 SB1-4 20200429.GPJ DATATMPL.GDT PRINT DATE: 4/30/20:SB

Appendix E
Soil Gas Logs

Field Form – Summa Canister Sampling

Sub-Slab or Soil Vapor Sampling

Remember to allow sample point to equilibrate 20-30 minutes before sampling

PBS Project No.: 24061.000

Sample ID: ~~SSV-1~~ MK SG-1 (Goes w/ SP-1)

Site Name: Washougal Phase II

Date: March 19, 2020

Canister ID: 009138

Concrete Slab Thickness (in): _____

Flow Controller ID: 065970

Gauge ID: —

Tracer Gas Used: Helium

Helium Meter Type: MGD-2002

Sample Point Diameter (in): 1/4"

"Seat" Diameter (in): NA

Tubing Length (ft): 13

PRT or Vapor Pin Used (circle if applicable)

Canister Pressure

Initial: -28

Final: -5

mm Hg / (in Hg) — circle one

Sampling Time

Begin: 1447

End: 1451

Purge Volume

260 mL

Shut-in Test Performed ☒ Yes ☐ No

Pressure Held: -17 mm Hg / (in Hg) — circle one

How long (min): 2

Helium Concentration in Shroud

Prior to Sampling (%): 75%

Mid Sample (%): 74.5

After Sampling (%): 12%

Real-Time Leak Test

Helium at Sample Point (ppmv): (before sampling) 500 ppm (after sampling) 825 ppm

PID at Sample Point (ppm) — (optional)

Comments/Observations (if soil gas was sampled indicate depth at which sample was collected here): 5'

PBS

Revised May 2017

Field Form – Summa Canister Sampling

Sub-Slab or Soil Vapor Sampling

Remember to allow sample point to equilibrate 20-30 minutes before sampling

PBS Project No.: 24061.000 Sample ID: SG-2 (Goes w/ SB-6)

Site Name: Washougal Phase II Date: March 19, 2020

Canister ID: 010582 Concrete Slab Thickness (in): _____

Flow Controller ID: 008446 Gauge ID: —

Tracer Gas Used: Helium Helium Meter Type: MGD-2002

Sample Point Diameter (in): 1/4" "Seat" Diameter (in): NA

Tubing Length (ft): 11 ft. PRT or (Vapor Pin) Used (circle if applicable)

Canister Pressure

Initial: -30 mm Hg

Final: -7 (in Hg) *circle one*

Sampling Time

Begin: 1532

End: 1537

Purge Volume

220 mL

Shut-in Test Performed ☒ Yes ☐ No

Pressure Held: -17 mm Hg (in Hg) *circle one*

How long (min): 2

Helium Concentration in Shroud

Prior to Sampling (%): 80%

After Sampling (%): 6%

Mid Sample (%): 70%

Real-Time Leak Test

Helium at Sample Point (ppmv): (before sampling) 325 ppm (after sampling) 575 ppm

PID at Sample Point (ppm) _____ (optional)

Comments/Observations (if soil gas was sampled indicate depth at which sample was collected here): 5'

PBS

Revised May 2017

Field Form – Summa Canister Sampling
Sub-Slab or Soil Vapor Sampling
Remember to allow sample point to equilibrate 20-30 minutes before sampling

PBS Project No.: 24061.000 Sample ID: SG-3 (SB-2)

Site Name: Washougal Phase II Date: March 19, 2020

Canister ID: 008511 Concrete Slab Thickness (in): _____

Flow Controller ID: 0011756 Gauge ID: _____

Tracer Gas Used: Helium Helium Meter Type: MGD-2002

Sample Point Diameter (in): _____ "Seat" Diameter (in): NA

Tubing Length (ft): 14 PRT or Vapor Pin Used (circle if applicable)

Canister Pressure

Initial: -30 mm Hg

Final: -7 in Hg *circle one*

Sampling Time

Begin: 1615

End: 1619

Purge Volume

280 mL

Shut-in Test Performed ☒ Yes ☐ No

Pressure Held: -17.5 mm Hg / in Hg *circle one* How long (min): 2

Helium Concentration in Shroud

Prior to Sampling (%): 75 Mid Sample (%): 70

After Sampling (%): 21

Real-Time Leak Test

Helium at Sample Point (ppmv): (before sampling) 275 ppm (after sampling) 200 ppm

PID at Sample Point (ppm) _____
(optional)

Comments/Observations (if soil gas was sampled indicate depth at which sample was collected here): 5'

PBS

Appendix F
Laboratory Reports

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 25, 2020

PBS Engineering & Env.- POR

Sample Delivery Group:	L1201524
Samples Received:	03/21/2020
Project Number:	24061.000
Description:	Phase II

Report To: Chris Sheridan
4412 SW Corbett Ave
Portland, OR 97239

Entire Report Reviewed By:

Brian Ford
Project Manager

TABLE OF CONTENTS

SG-1 L1201524-01 Air

Collected by: Shad Brooks
Collected date/time: 03/19/20 14:51
Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method ASTM 1946	WG1447630	1	03/24/20 13:01	03/24/20 13:01	JAL	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1448092	1	03/21/20 23:56	03/21/20 23:56	CAW	Mt. Juliet, TN

SG-2 L1201524-02 Air

Collected by: Shad Brooks
Collected date/time: 03/19/20 15:37
Received date/time: 03/21/20 08:45

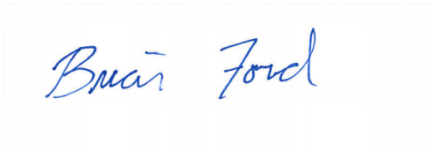
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method ASTM 1946	WG1447630	1	03/24/20 13:04	03/24/20 13:04	JAL	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1448092	1	03/22/20 00:45	03/22/20 00:45	CAW	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1448815	10	03/23/20 21:30	03/23/20 21:30	CAW	Mt. Juliet, TN

SG-3 L1201524-03 Air

Collected by: Shad Brooks
Collected date/time: 03/19/20 16:15
Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method ASTM 1946	WG1447630	1	03/24/20 13:19	03/24/20 13:19	JAL	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1448092	1	03/22/20 01:31	03/22/20 01:31	CAW	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1448815	10	03/23/20 22:05	03/23/20 22:05	CAW	Mt. Juliet, TN

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

Volatile Organic Compounds (GC) by Method ASTM 1946

Analyte	CAS #	Mol. Wt.	RDL %	Result %	Qualifier	Dilution	Batch
Helium	7440-59-7		0.100	0.279		1	WG1447630

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	12.7	30.2		1	WG1448092
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1448092
Benzene	71-43-2	78.10	0.200	0.639	5.03	16.1		1	WG1448092
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1448092
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1448092
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1448092
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1448092
1,3-Butadiene	106-99-0	54.10	2.00	4.43	6.40	14.2		1	WG1448092
Carbon disulfide	75-15-0	76.10	0.200	0.622	0.663	2.06		1	WG1448092
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1448092
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1448092
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1448092
Chloroform	67-66-3	119	0.200	0.973	4.56	22.2		1	WG1448092
Chloromethane	74-87-3	50.50	0.200	0.413	0.637	1.32		1	WG1448092
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1448092
Cyclohexane	110-82-7	84.20	0.200	0.689	ND	ND		1	WG1448092
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1448092
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1448092
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1448092
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1448092
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1448092
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1448092
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1448092
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1448092
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1448092
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1448092
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1448092
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1448092
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1448092
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1448092
Ethanol	64-17-5	46.10	0.630	1.19	8.41	15.9		1	WG1448092
Ethylbenzene	100-41-4	106	0.200	0.867	0.628	2.72		1	WG1448092
4-Ethyltoluene	622-96-8	120	0.200	0.982	0.336	1.65		1	WG1448092
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.457	2.57		1	WG1448092
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.487	2.41		1	WG1448092
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1448092
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1448092
Heptane	142-82-5	100	0.200	0.818	0.434	1.78		1	WG1448092
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1448092
n-Hexane	110-54-3	86.20	0.200	0.705	1.22	4.30		1	WG1448092
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1448092
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1448092
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1448092
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	2.54	7.49		1	WG1448092
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1448092
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1448092
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1448092
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1448092
2-Propanol	67-63-0	60.10	1.25	3.07	ND	ND		1	WG1448092
Propene	115-07-1	42.10	0.400	0.689	44.6	76.8		1	WG1448092

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Styrene	100-42-5	104	0.200	0.851	0.486	2.07		1	WG1448092
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1448092
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND		1	WG1448092
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1448092
Toluene	108-88-3	92.10	0.200	0.753	4.63	17.4		1	WG1448092
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1448092
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1448092
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1448092
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1448092
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.289	1.42		1	WG1448092
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1448092
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1448092
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1448092
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1448092
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1448092
m&p-Xylene	1330-20-7	106	0.400	1.73	1.25	5.42		1	WG1448092
o-Xylene	95-47-6	106	0.200	0.867	0.620	2.69		1	WG1448092
TPH (GC/MS) Low Fraction	8006-61-9	101	200	826	ND	ND		1	WG1448092
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.7*				WG1448092

Volatile Organic Compounds (GC) by Method ASTM 1946

Analyte	CAS #	Mol. Wt.	RDL %	Result %	Qualifier	Dilution	Batch
Helium	7440-59-7		0.100	0.597		1	WG1447630

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	28.6	68.0		1	WG1448092
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1448092
Benzene	71-43-2	78.10	0.200	0.639	20.5	65.5		1	WG1448092
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1448092
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1448092
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1448092
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1448092
1,3-Butadiene	106-99-0	54.10	2.00	4.43	44.0	97.4		1	WG1448092
Carbon disulfide	75-15-0	76.10	0.200	0.622	5.16	16.1		1	WG1448092
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1448092
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1448092
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1448092
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1448092
Chloromethane	74-87-3	50.50	0.200	0.413	1.70	3.51		1	WG1448092
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1448092
Cyclohexane	110-82-7	84.20	0.200	0.689	2.35	8.09		1	WG1448092
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1448092
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1448092
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1448092
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1448092
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1448092
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1448092
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1448092
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1448092
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1448092
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1448092
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1448092
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1448092
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1448092
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1448092
Ethanol	64-17-5	46.10	0.630	1.19	11.4	21.5		1	WG1448092
Ethylbenzene	100-41-4	106	0.200	0.867	1.69	7.33		1	WG1448092
4-Ethyltoluene	622-96-8	120	0.200	0.982	0.718	3.52		1	WG1448092
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.278	1.56		1	WG1448092
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.859	4.25		1	WG1448092
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1448092
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1448092
Heptane	142-82-5	100	0.200	0.818	3.75	15.3		1	WG1448092
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1448092
n-Hexane	110-54-3	86.20	2.00	7.05	175	617		10	WG1448815
Isopropylbenzene	98-82-8	120.20	0.200	0.983	0.211	1.04		1	WG1448092
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1448092
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1448092
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	5.83	17.2		1	WG1448092
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1448092
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1448092
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1448092
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1448092
2-Propanol	67-63-0	60.10	1.25	3.07	1.94	4.77		1	WG1448092
Propene	115-07-1	42.10	4.00	6.89	280	482		10	WG1448815

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Styrene	100-42-5	104	0.200	0.851	1.76	7.49		1	WG1448092
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1448092
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND		1	WG1448092
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1448092
Toluene	108-88-3	92.10	0.200	0.753	14.6	55.0		1	WG1448092
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1448092
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1448092
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1448092
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1448092
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.607	2.98		1	WG1448092
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1448092
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	0.916	4.28		1	WG1448092
Vinyl chloride	75-01-4	62.50	0.200	0.511	0.448	1.15		1	WG1448092
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1448092
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1448092
m&p-Xylene	1330-20-7	106	0.400	1.73	3.33	14.4		1	WG1448092
o-Xylene	95-47-6	106	0.200	0.867	1.55	6.72		1	WG1448092
TPH (GC/MS) Low Fraction	8006-61-9	101	200	826	727	3000		1	WG1448092
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.1*				WG1448092
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*89.1*				WG1448815

Volatile Organic Compounds (GC) by Method ASTM 1946

Analyte	CAS #	Mol. Wt.	RDL %	Result %	Qualifier	Dilution	Batch
Helium	7440-59-7		0.100	ND		1	WG1447630

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	14.2	33.7		1	WG1448092
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1448092
Benzene	71-43-2	78.10	0.200	0.639	12.6	40.2		1	WG1448092
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1448092
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1448092
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1448092
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1448092
1,3-Butadiene	106-99-0	54.10	2.00	4.43	39.4	87.2		1	WG1448092
Carbon disulfide	75-15-0	76.10	0.200	0.622	1.26	3.92		1	WG1448092
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1448092
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1448092
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1448092
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1448092
Chloromethane	74-87-3	50.50	0.200	0.413	0.557	1.15		1	WG1448092
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1448092
Cyclohexane	110-82-7	84.20	0.200	0.689	1.04	3.58		1	WG1448092
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1448092
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1448092
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1448092
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1448092
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1448092
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1448092
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1448092
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	0.265	1.05		1	WG1448092
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1448092
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1448092
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1448092
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1448092
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1448092
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1448092
Ethanol	64-17-5	46.10	0.630	1.19	18.4	34.7		1	WG1448092
Ethylbenzene	100-41-4	106	0.200	0.867	1.31	5.68		1	WG1448092
4-Ethyltoluene	622-96-8	120	0.200	0.982	0.502	2.46		1	WG1448092
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.483	2.71		1	WG1448092
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.507	2.51		1	WG1448092
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1448092
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1448092
Heptane	142-82-5	100	0.200	0.818	3.59	14.7		1	WG1448092
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1448092
n-Hexane	110-54-3	86.20	0.200	0.705	11.2	39.5		1	WG1448092
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1448092
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1448092
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1448092
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	3.08	9.08		1	WG1448092
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1448092
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1448092
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1448092
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1448092
2-Propanol	67-63-0	60.10	1.25	3.07	1.48	3.64		1	WG1448092
Propene	115-07-1	42.10	4.00	6.89	216	372		10	WG1448815

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Styrene	100-42-5	104	0.200	0.851	0.581	2.47		1	WG1448092
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1448092
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.257	1.74		1	WG1448092
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1448092
Toluene	108-88-3	92.10	0.200	0.753	9.70	36.5		1	WG1448092
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1448092
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1448092
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1448092
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1448092
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.361	1.77		1	WG1448092
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1448092
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1448092
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1448092
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1448092
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1448092
m&p-Xylene	1330-20-7	106	0.400	1.73	2.04	8.84		1	WG1448092
o-Xylene	95-47-6	106	0.200	0.867	0.895	3.88		1	WG1448092
TPH (GC/MS) Low Fraction	8006-61-9	101	200	826	315	1300		1	WG1448092
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*98.9*				WG1448092
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*89.8*				WG1448815

Method Blank (MB)

(MB) R3511902-3 03/24/20 12:26

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Helium	U		0.0259	0.100

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

(LCS) R3511902-1 03/24/20 11:04 • (LCSD) R3511902-2 03/24/20 11:07

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	%	%	%	%	%	%			%	%
Helium	2.50	2.24	2.25	89.6	90.0	70.0-130			0.445	25

Method Blank (MB)

(MB) R3511384-3 03/21/20 11:23

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	U		0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3511384-3 03/21/20 11:23

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	U		0.154	0.630
2-Propanol	U		0.0882	1.25
Propene	U		0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	0.158	J	0.0832	0.630
TPH (GC/MS) Low Fraction	22.0	J	6.91	200
(S) 1,4-Bromofluorobenzene	*94.3*			*60.0-140*

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

(LCS) R3511384-1 03/21/20 09:47 • (LCSD) R3511384-2 03/21/20 10:36

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	2.86	2.90	76.3	77.3	55.0-148			1.39	25
Propene	3.75	3.04	3.09	81.1	82.4	64.0-144			1.63	25
Dichlorodifluoromethane	3.75	3.63	3.62	96.8	96.5	64.0-139			0.276	25
1,2-Dichlorotetrafluoroethane	3.75	3.66	3.68	97.6	98.1	70.0-130			0.545	25

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

(LCS) R3511384-1 03/21/20 09:47 • (LCSD) R3511384-2 03/21/20 10:36

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloromethane	3.75	3.33	3.32	88.8	88.5	70.0-130			0.301	25
Vinyl chloride	3.75	3.45	3.44	92.0	91.7	70.0-130			0.290	25
1,3-Butadiene	3.75	3.10	3.15	82.7	84.0	70.0-130			1.60	25
Bromomethane	3.75	3.76	3.67	100	97.9	70.0-130			2.42	25
Chloroethane	3.75	3.46	3.49	92.3	93.1	70.0-130			0.863	25
Trichlorofluoromethane	3.75	3.67	3.70	97.9	98.7	70.0-130			0.814	25
1,1,2-Trichlorotrifluoroethane	3.75	3.80	3.75	101	100	70.0-130			1.32	25
1,1-Dichloroethene	3.75	3.45	3.53	92.0	94.1	70.0-130			2.29	25
1,1-Dichloroethane	3.75	3.54	3.52	94.4	93.9	70.0-130			0.567	25
Acetone	3.75	3.01	3.08	80.3	82.1	70.0-130			2.30	25
2-Propanol	3.75	3.34	3.32	89.1	88.5	70.0-139			0.601	25
Carbon disulfide	3.75	3.62	3.61	96.5	96.3	70.0-130			0.277	25
Methylene Chloride	3.75	3.33	3.37	88.8	89.9	70.0-130			1.19	25
MTBE	3.75	3.56	3.59	94.9	95.7	70.0-130			0.839	25
trans-1,2-Dichloroethene	3.75	3.48	3.57	92.8	95.2	70.0-130			2.55	25
n-Hexane	3.75	3.46	3.45	92.3	92.0	70.0-130			0.289	25
Vinyl acetate	3.75	2.86	2.73	76.3	72.8	70.0-130			4.65	25
Methyl Ethyl Ketone	3.75	3.58	3.51	95.5	93.6	70.0-130			1.97	25
cis-1,2-Dichloroethene	3.75	3.34	3.37	89.1	89.9	70.0-130			0.894	25
Chloroform	3.75	3.66	3.64	97.6	97.1	70.0-130			0.548	25
Cyclohexane	3.75	3.69	3.69	98.4	98.4	70.0-130			0.000	25
1,1,1-Trichloroethane	3.75	3.66	3.66	97.6	97.6	70.0-130			0.000	25
Carbon tetrachloride	3.75	3.75	3.73	100	99.5	70.0-130			0.535	25
Benzene	3.75	3.61	3.61	96.3	96.3	70.0-130			0.000	25
1,2-Dichloroethane	3.75	3.58	3.51	95.5	93.6	70.0-130			1.97	25
Heptane	3.75	3.88	3.85	103	103	70.0-130			0.776	25
Trichloroethylene	3.75	3.85	3.79	103	101	70.0-130			1.57	25
1,2-Dichloropropane	3.75	3.60	3.50	96.0	93.3	70.0-130			2.82	25
1,4-Dioxane	3.75	3.70	3.60	98.7	96.0	70.0-140			2.74	25
Bromodichloromethane	3.75	3.64	3.69	97.1	98.4	70.0-130			1.36	25
cis-1,3-Dichloropropene	3.75	3.74	3.75	99.7	100	70.0-130			0.267	25
4-Methyl-2-pentanone (MIBK)	3.75	3.38	3.38	90.1	90.1	70.0-139			0.000	25
Toluene	3.75	3.76	3.70	100	98.7	70.0-130			1.61	25
trans-1,3-Dichloropropene	3.75	3.79	3.73	101	99.5	70.0-130			1.60	25
1,1,2-Trichloroethane	3.75	3.86	3.89	103	104	70.0-130			0.774	25
Tetrachloroethylene	3.75	4.15	4.07	111	109	70.0-130			1.95	25
Methyl Butyl Ketone	3.75	3.43	3.35	91.5	89.3	70.0-149			2.36	25
Dibromochloromethane	3.75	4.11	4.01	110	107	70.0-130			2.46	25
1,2-Dibromoethane	3.75	4.09	4.04	109	108	70.0-130			1.23	25
Chlorobenzene	3.75	4.06	3.98	108	106	70.0-130			1.99	25

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

(LCS) R3511384-1 03/21/20 09:47 • (LCSD) R3511384-2 03/21/20 10:36

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylbenzene	3.75	3.81	3.76	102	100	70.0-130			1.32	25
m&p-Xylene	7.50	7.72	7.70	103	103	70.0-130			0.259	25
o-Xylene	3.75	3.83	3.86	102	103	70.0-130			0.780	25
Styrene	3.75	4.00	4.01	107	107	70.0-130			0.250	25
Bromoform	3.75	4.16	4.19	111	112	70.0-130			0.719	25
1,1,2,2-Tetrachloroethane	3.75	4.04	3.98	108	106	70.0-130			1.50	25
4-Ethyltoluene	3.75	4.20	4.13	112	110	70.0-130			1.68	25
1,3,5-Trimethylbenzene	3.75	3.96	3.86	106	103	70.0-130			2.56	25
1,2,4-Trimethylbenzene	3.75	4.01	3.99	107	106	70.0-130			0.500	25
1,3-Dichlorobenzene	3.75	4.51	4.45	120	119	70.0-130			1.34	25
1,4-Dichlorobenzene	3.75	4.55	4.45	121	119	70.0-130			2.22	25
Benzyl Chloride	3.75	3.47	3.51	92.5	93.6	70.0-152			1.15	25
1,2-Dichlorobenzene	3.75	4.58	4.49	122	120	70.0-130			1.98	25
1,2,4-Trichlorobenzene	3.75	4.45	4.44	119	118	70.0-160			0.225	25
Hexachloro-1,3-butadiene	3.75	4.16	4.09	111	109	70.0-151			1.70	25
Naphthalene	3.75	4.23	4.20	113	112	70.0-159			0.712	25
TPH (GC/MS) Low Fraction	203	219	218	108	107	70.0-130			0.458	25
Allyl Chloride	3.75	3.62	3.72	96.5	99.2	70.0-130			2.72	25
2-Chlorotoluene	3.75	3.87	3.81	103	102	70.0-130			1.56	25
Methyl Methacrylate	3.75	3.58	3.43	95.5	91.5	70.0-130			4.28	25
Tetrahydrofuran	3.75	3.21	3.24	85.6	86.4	70.0-137			0.930	25
2,2,4-Trimethylpentane	3.75	3.39	3.45	90.4	92.0	70.0-130			1.75	25
Vinyl Bromide	3.75	3.75	3.81	100	102	70.0-130			1.59	25
Isopropylbenzene	3.75	3.91	3.90	104	104	70.0-130			0.256	25
(S) 1,4-Bromofluorobenzene				*100*	*101*	*60.0-140*				

Method Blank (MB)

(MB) R3511745-3 03/23/20 09:48

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
n-Hexane	U		0.0457	0.200
Propene	0.0934	J	0.0932	0.400
(S) 1,4-Bromofluorobenzene	*90.7*			*60.0-140*

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

(LCS) R3511745-1 03/23/20 08:33 • (LCSD) R3511745-2 03/23/20 09:11

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Propene	3.75	3.38	3.36	90.1	89.6	64.0-144			0.593	25
n-Hexane	3.75	3.69	3.67	98.4	97.9	70.0-130			0.543	25
(S) 1,4-Bromofluorobenzene				*92.3*	*92.2*	*60.0-140*				

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

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	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.
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
J	The identification of the analyte is acceptable; the reported value is an estimate.

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* 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 National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
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	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

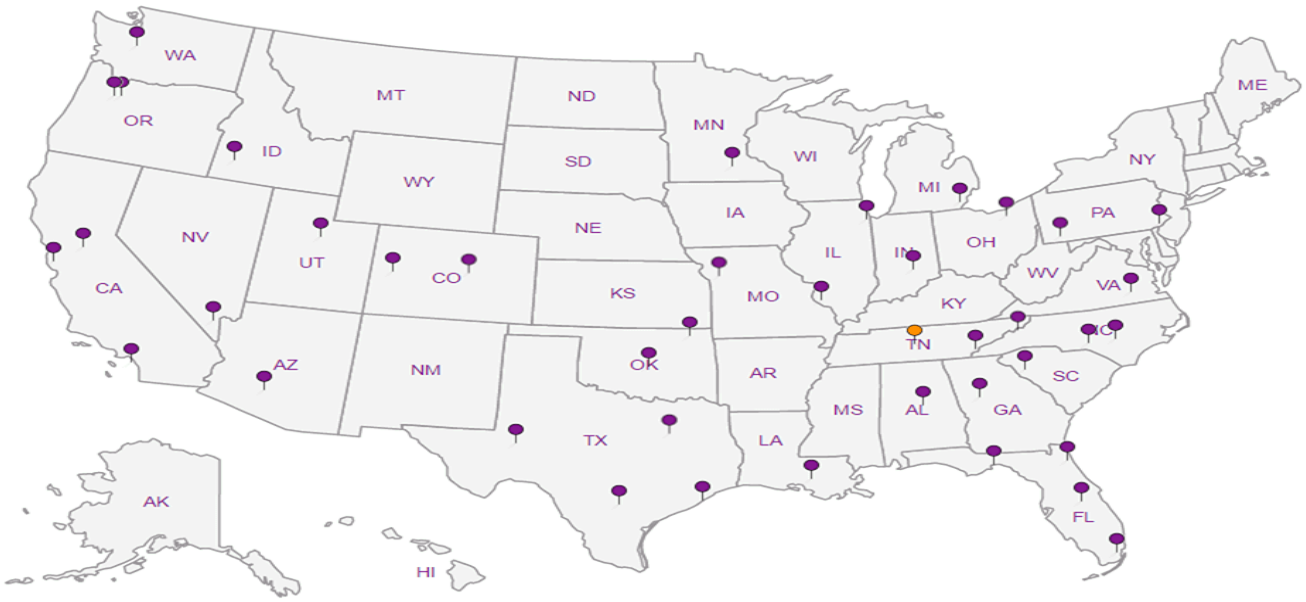
Third Party Federal Accreditations

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



PBS Engineering & Env.- POR

4412 SW Corbett Ave
Portland, OR 97239

Billing Information:
Accounts Payable
4412 SW Corbett Ave
Portland, OR 97239

Report to: Chris Sheridan
Email To: Chris.Sheridan@Pbsusa.com

Project Description: Phase II
City/State Collected: Washougal / Washington

Phone: 503-248-1939
Fax: 503-248-0223

Client Project # 24061.000
Lab Project #

Collected by (print): Shad Brooks
Site/Facility ID #
P.O. #

Collected by (signature):
Immediately Packed on Ice N X Y ___

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

Quote #
Date Results Needed

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical® National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 120524
Table # M101
Acctnum: PBSENGPOR
Template:
Prelogin:
TSR: 110 - Brian Ford
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TPH-Gx	VOCs	Remarks	Sample # (lab only)
SG-1	Grab	Air	5'	3/19	1451	1	X	X		01
SG-2	G	Air	5'	3/19	1537		X	X		02
SG-3	G	Air	5'	3/19	1615		X	X		03
SG-1-1	G	Air	5'	3/19	1615		X	X	Hold	

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

Remarks: Hold SG-1-1

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

pH _____ Temp _____
Flow _____ Other _____

Tracking # 4686 6470 7650, 4794 8832 2636

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Shad Brooks	3/20/20	1000		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: Amb °C Bottles Received: 4
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/21/20 Time: 0845
			Billy Barnes	Hold: Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 27, 2020

PBS Engineering & Env.- POR

Sample Delivery Group:	L1201489
Samples Received:	03/21/2020
Project Number:	24061.000
Description:	Phase II

Report To: Chris Sheridan
4412 SW Corbett Ave
Portland, OR 97239

Entire Report Reviewed By:

Brian Ford
Project Manager

TABLE OF CONTENTS

SB-1 L1201489-01 Solid

Collected by: Shad Brooks | Collected date/time: 03/19/20 15:30 | Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1448582	1	03/24/20 07:35	03/24/20 07:44	KBC	Mt. Juliet, TN
Mercury by Method 7471B	WG1448314	1	03/24/20 09:33	03/24/20 18:32	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448390	5	03/22/20 06:39	03/23/20 14:42	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1448533	25	03/19/20 15:30	03/22/20 21:03	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1448460	1.19	03/19/20 15:30	03/23/20 07:36	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1450328	10	03/26/20 20:40	03/27/20 06:25	JN	Mt. Juliet, TN

SB-2 L1201489-02 Solid

Collected by: Shad Brooks | Collected date/time: 03/19/20 13:15 | Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1448582	1	03/24/20 07:35	03/24/20 07:44	KBC	Mt. Juliet, TN
Mercury by Method 7471B	WG1448314	1	03/24/20 09:33	03/24/20 18:34	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 15:41	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 20:51	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1448533	25	03/19/20 13:15	03/22/20 21:23	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1448460	1	03/19/20 13:15	03/23/20 07:55	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1448874	1	03/24/20 16:32	03/25/20 13:43	FM	Mt. Juliet, TN

SB-3 L1201489-03 Solid

Collected by: Shad Brooks | Collected date/time: 03/19/20 11:20 | Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1448582	1	03/24/20 07:35	03/24/20 07:44	KBC	Mt. Juliet, TN
Mercury by Method 7471B	WG1448314	1	03/24/20 09:33	03/24/20 18:37	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 15:45	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 20:55	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1448533	25	03/19/20 11:20	03/22/20 21:44	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1448460	1	03/19/20 11:20	03/23/20 08:14	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1448874	1	03/24/20 16:32	03/25/20 13:56	FM	Mt. Juliet, TN

SB-4 L1201489-04 Solid

Collected by: Shad Brooks | Collected date/time: 03/19/20 12:45 | Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1448582	1	03/24/20 07:35	03/24/20 07:44	KBC	Mt. Juliet, TN
Mercury by Method 7471B	WG1448314	1	03/24/20 09:33	03/24/20 18:40	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 15:48	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 20:58	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1448533	25	03/19/20 12:45	03/22/20 22:05	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1448460	1	03/19/20 12:45	03/23/20 08:33	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1450328	1	03/26/20 20:40	03/27/20 01:34	JN	Mt. Juliet, TN

SB-5 L1201489-05 Solid

Collected by: Shad Brooks | Collected date/time: 03/19/20 12:30 | Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1448582	1	03/24/20 07:35	03/24/20 07:44	KBC	Mt. Juliet, TN
Mercury by Method 7471B	WG1448314	1	03/24/20 09:33	03/24/20 18:42	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 15:52	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 21:01	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1448533	25	03/19/20 12:30	03/22/20 22:25	ADM	Mt. Juliet, TN

SB-5 L1201489-05 Solid

Collected by: Shad Brooks
Collected date/time: 03/19/20 12:30
Received date/time: 03/21/20 08:45

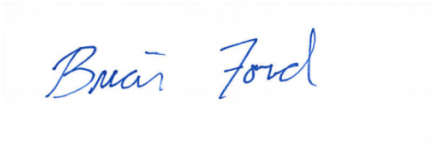
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1448460	1	03/19/20 12:30	03/23/20 08:52	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1450328	1	03/26/20 20:40	03/27/20 06:11	JN	Mt. Juliet, TN

SB-6 L1201489-06 Solid

Collected by: Shad Brooks
Collected date/time: 03/19/20 11:00
Received date/time: 03/21/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1448582	1	03/24/20 07:35	03/24/20 07:44	KBC	Mt. Juliet, TN
Mercury by Method 7471B	WG1448314	1	03/24/20 09:33	03/24/20 18:45	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 16:02	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1448041	5	03/22/20 06:41	03/23/20 21:05	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method NWTPHGX	WG1448533	25	03/19/20 11:00	03/22/20 22:46	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1448460	1	03/19/20 11:00	03/23/20 09:11	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1448874	1	03/24/20 16:32	03/25/20 14:08	FM	Mt. Juliet, TN

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

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	86.2		1	03/24/2020 07:44	WG1448582

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0794		0.0348	1	03/24/2020 18:32	WG1448314

Metals (ICPMS) by Method 6020B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	5.25	J6	0.580	5	03/23/2020 14:42	WG1448390
Barium	195	J5	1.16	5	03/23/2020 14:42	WG1448390
Cadmium	0.627		0.580	5	03/23/2020 14:42	WG1448390
Chromium	22.5	J6	1.16	5	03/23/2020 14:42	WG1448390
Lead	171	J6	0.580	5	03/23/2020 14:42	WG1448390
Selenium	ND		0.580	5	03/23/2020 14:42	WG1448390
Silver	ND		0.580	5	03/23/2020 14:42	WG1448390

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		2.90	25	03/22/2020 21:03	WG1448533
(S) a,a,a-Trifluorotoluene(FID)	*98.6*		*77.0-120*		*03/22/2020 21:03*	WG1448533

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	J0	0.0345	1.19	03/23/2020 07:36	WG1448460
Acrylonitrile	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
Benzene	ND		0.00138	1.19	03/23/2020 07:36	WG1448460
Bromobenzene	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
Bromodichloromethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Bromoform	ND		0.0345	1.19	03/23/2020 07:36	WG1448460
Bromomethane	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
n-Butylbenzene	ND	J0	0.0173	1.19	03/23/2020 07:36	WG1448460
sec-Butylbenzene	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
tert-Butylbenzene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
Carbon tetrachloride	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
Chlorobenzene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Chlorodibromomethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Chloroethane	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
Chloroform	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Chloromethane	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
2-Chlorotoluene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
4-Chlorotoluene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,2-Dibromo-3-Chloropropane	ND		0.0345	1.19	03/23/2020 07:36	WG1448460
1,2-Dibromoethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Dibromomethane	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,2-Dichlorobenzene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,3-Dichlorobenzene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,4-Dichlorobenzene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
Dichlorodifluoromethane	ND	J0	0.00345	1.19	03/23/2020 07:36	WG1448460
1,1-Dichloroethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
1,2-Dichloroethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460

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		0.00345	1.19	03/23/2020 07:36	WG1448460
cis-1,2-Dichloroethene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
trans-1,2-Dichloroethene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,2-Dichloropropane	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,1-Dichloropropene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
1,3-Dichloropropane	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
cis-1,3-Dichloropropene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
trans-1,3-Dichloropropene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
2,2-Dichloropropane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Di-isopropyl ether	ND		0.00138	1.19	03/23/2020 07:36	WG1448460
Ethylbenzene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Hexachloro-1,3-butadiene	ND		0.0345	1.19	03/23/2020 07:36	WG1448460
Isopropylbenzene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
p-Isopropyltoluene	ND	J0	0.00690	1.19	03/23/2020 07:36	WG1448460
2-Butanone (MEK)	0.0536	B	0.0345	1.19	03/23/2020 07:36	WG1448460
Methylene Chloride	ND		0.0345	1.19	03/23/2020 07:36	WG1448460
4-Methyl-2-pentanone (MIBK)	ND		0.0345	1.19	03/23/2020 07:36	WG1448460
Methyl tert-butyl ether	ND		0.00138	1.19	03/23/2020 07:36	WG1448460
Naphthalene	ND	J0	0.0173	1.19	03/23/2020 07:36	WG1448460
n-Propylbenzene	ND	J0	0.00690	1.19	03/23/2020 07:36	WG1448460
Styrene	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
1,1,1,2-Tetrachloroethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
1,1,2,2-Tetrachloroethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
1,1,2-Trichlorotrifluoroethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Tetrachloroethene	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Toluene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,2,3-Trichlorobenzene	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
1,2,4-Trichlorobenzene	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
1,1,1-Trichloroethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
1,1,2-Trichloroethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Trichloroethene	ND		0.00138	1.19	03/23/2020 07:36	WG1448460
Trichlorofluoromethane	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
1,2,3-Trichloropropane	ND		0.0173	1.19	03/23/2020 07:36	WG1448460
1,2,4-Trimethylbenzene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,2,3-Trimethylbenzene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
1,3,5-Trimethylbenzene	ND		0.00690	1.19	03/23/2020 07:36	WG1448460
Vinyl chloride	ND		0.00345	1.19	03/23/2020 07:36	WG1448460
Xylenes, Total	ND		0.00898	1.19	03/23/2020 07:36	WG1448460
(S) Toluene-d8	*101*		*75.0-131*		*03/23/2020 07:36*	WG1448460
(S) 4-Bromofluorobenzene	*79.6*		*67.0-138*		*03/23/2020 07:36*	WG1448460
(S) 1,2-Dichloroethane-d4	*104*		*70.0-130*		*03/23/2020 07:36*	WG1448460

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	59.9		46.4	10	03/27/2020 06:25	WG1450328
Residual Range Organics (RRO)	299		116	10	03/27/2020 06:25	WG1450328
(S) o-Terphenyl	*49.4*		*18.0-148*		*03/27/2020 06:25*	WG1450328

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	79.7		1	03/24/2020 07:44	WG1448582

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0376	1	03/24/2020 18:34	WG1448314

Metals (ICPMS) by Method 6020B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	5.44		0.627	5	03/23/2020 15:41	WG1448041
Barium	118		1.25	5	03/23/2020 15:41	WG1448041
Cadmium	ND		0.627	5	03/23/2020 15:41	WG1448041
Chromium	19.9		1.25	5	03/23/2020 15:41	WG1448041
Lead	12.6		0.627	5	03/23/2020 15:41	WG1448041
Selenium	ND		0.627	5	03/23/2020 20:51	WG1448041
Silver	ND		0.627	5	03/23/2020 15:41	WG1448041

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		3.14	25	03/22/2020 21:23	WG1448533
(S) a,a,a-Trifluorotoluene(FID)	*97.3*		*77.0-120*		*03/22/2020 21:23*	WG1448533

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	J0	0.0314	1	03/23/2020 07:55	WG1448460
Acrylonitrile	ND		0.0157	1	03/23/2020 07:55	WG1448460
Benzene	ND		0.00125	1	03/23/2020 07:55	WG1448460
Bromobenzene	ND		0.0157	1	03/23/2020 07:55	WG1448460
Bromodichloromethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
Bromoform	ND		0.0314	1	03/23/2020 07:55	WG1448460
Bromomethane	ND		0.0157	1	03/23/2020 07:55	WG1448460
n-Butylbenzene	ND	J0	0.0157	1	03/23/2020 07:55	WG1448460
sec-Butylbenzene	ND		0.0157	1	03/23/2020 07:55	WG1448460
tert-Butylbenzene	ND		0.00627	1	03/23/2020 07:55	WG1448460
Carbon tetrachloride	ND		0.00627	1	03/23/2020 07:55	WG1448460
Chlorobenzene	ND		0.00314	1	03/23/2020 07:55	WG1448460
Chlorodibromomethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
Chloroethane	ND		0.00627	1	03/23/2020 07:55	WG1448460
Chloroform	ND		0.00314	1	03/23/2020 07:55	WG1448460
Chloromethane	ND		0.0157	1	03/23/2020 07:55	WG1448460
2-Chlorotoluene	ND		0.00314	1	03/23/2020 07:55	WG1448460
4-Chlorotoluene	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,2-Dibromo-3-Chloropropane	ND		0.0314	1	03/23/2020 07:55	WG1448460
1,2-Dibromoethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
Dibromomethane	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,2-Dichlorobenzene	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,3-Dichlorobenzene	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,4-Dichlorobenzene	ND		0.00627	1	03/23/2020 07:55	WG1448460
Dichlorodifluoromethane	ND	J0	0.00314	1	03/23/2020 07:55	WG1448460
1,1-Dichloroethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
1,2-Dichloroethane	ND		0.00314	1	03/23/2020 07:55	WG1448460

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		0.00314	1	03/23/2020 07:55	WG1448460
cis-1,2-Dichloroethene	ND		0.00314	1	03/23/2020 07:55	WG1448460
trans-1,2-Dichloroethene	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,2-Dichloropropane	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,1-Dichloropropene	ND		0.00314	1	03/23/2020 07:55	WG1448460
1,3-Dichloropropane	ND		0.00627	1	03/23/2020 07:55	WG1448460
cis-1,3-Dichloropropene	ND		0.00314	1	03/23/2020 07:55	WG1448460
trans-1,3-Dichloropropene	ND		0.00627	1	03/23/2020 07:55	WG1448460
2,2-Dichloropropane	ND		0.00314	1	03/23/2020 07:55	WG1448460
Di-isopropyl ether	ND		0.00125	1	03/23/2020 07:55	WG1448460
Ethylbenzene	ND		0.00314	1	03/23/2020 07:55	WG1448460
Hexachloro-1,3-butadiene	ND		0.0314	1	03/23/2020 07:55	WG1448460
Isopropylbenzene	ND		0.00314	1	03/23/2020 07:55	WG1448460
p-Isopropyltoluene	ND	J0	0.00627	1	03/23/2020 07:55	WG1448460
2-Butanone (MEK)	0.0718	B	0.0314	1	03/23/2020 07:55	WG1448460
Methylene Chloride	ND		0.0314	1	03/23/2020 07:55	WG1448460
4-Methyl-2-pentanone (MIBK)	ND		0.0314	1	03/23/2020 07:55	WG1448460
Methyl tert-butyl ether	ND		0.00125	1	03/23/2020 07:55	WG1448460
Naphthalene	ND	J0	0.0157	1	03/23/2020 07:55	WG1448460
n-Propylbenzene	ND	J0	0.00627	1	03/23/2020 07:55	WG1448460
Styrene	ND		0.0157	1	03/23/2020 07:55	WG1448460
1,1,1,2-Tetrachloroethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
1,1,2,2-Tetrachloroethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
1,1,2-Trichlorotrifluoroethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
Tetrachloroethene	ND		0.00314	1	03/23/2020 07:55	WG1448460
Toluene	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,2,3-Trichlorobenzene	ND		0.0157	1	03/23/2020 07:55	WG1448460
1,2,4-Trichlorobenzene	ND		0.0157	1	03/23/2020 07:55	WG1448460
1,1,1-Trichloroethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
1,1,2-Trichloroethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
Trichloroethene	ND		0.00125	1	03/23/2020 07:55	WG1448460
Trichlorofluoromethane	ND		0.00314	1	03/23/2020 07:55	WG1448460
1,2,3-Trichloropropane	ND		0.0157	1	03/23/2020 07:55	WG1448460
1,2,4-Trimethylbenzene	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,2,3-Trimethylbenzene	ND		0.00627	1	03/23/2020 07:55	WG1448460
1,3,5-Trimethylbenzene	ND		0.00627	1	03/23/2020 07:55	WG1448460
Vinyl chloride	ND		0.00314	1	03/23/2020 07:55	WG1448460
Xylenes, Total	ND		0.00815	1	03/23/2020 07:55	WG1448460
(S) Toluene-d8	*101*		*75.0-131*		*03/23/2020 07:55*	WG1448460
(S) 4-Bromofluorobenzene	*99.7*		*67.0-138*		*03/23/2020 07:55*	WG1448460
(S) 1,2-Dichloroethane-d4	*108*		*70.0-130*		*03/23/2020 07:55*	WG1448460

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	ND		5.02	1	03/25/2020 13:43	WG1448874
Residual Range Organics (RRO)	ND		12.5	1	03/25/2020 13:43	WG1448874
(S) o-Terphenyl	*56.8*		*18.0-148*		*03/25/2020 13:43*	WG1448874

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	77.9		1	03/24/2020 07:44	WG1448582

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0392		0.0385	1	03/24/2020 18:37	WG1448314

Metals (ICPMS) by Method 6020B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	4.94		0.642	5	03/23/2020 15:45	WG1448041
Barium	180		1.28	5	03/23/2020 15:45	WG1448041
Cadmium	ND		0.642	5	03/23/2020 15:45	WG1448041
Chromium	19.6		1.28	5	03/23/2020 15:45	WG1448041
Lead	29.8		0.642	5	03/23/2020 15:45	WG1448041
Selenium	ND		0.642	5	03/23/2020 20:55	WG1448041
Silver	ND		0.642	5	03/23/2020 15:45	WG1448041

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		3.21	25	03/22/2020 21:44	WG1448533
(S) a,a,a-Trifluorotoluene(FID)	*97.5*		*77.0-120*		*03/22/2020 21:44*	WG1448533

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	J0	0.0321	1	03/23/2020 08:14	WG1448460
Acrylonitrile	ND		0.0160	1	03/23/2020 08:14	WG1448460
Benzene	ND		0.00128	1	03/23/2020 08:14	WG1448460
Bromobenzene	ND		0.0160	1	03/23/2020 08:14	WG1448460
Bromodichloromethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
Bromoform	ND		0.0321	1	03/23/2020 08:14	WG1448460
Bromomethane	ND		0.0160	1	03/23/2020 08:14	WG1448460
n-Butylbenzene	ND	J0	0.0160	1	03/23/2020 08:14	WG1448460
sec-Butylbenzene	ND		0.0160	1	03/23/2020 08:14	WG1448460
tert-Butylbenzene	ND		0.00642	1	03/23/2020 08:14	WG1448460
Carbon tetrachloride	ND		0.00642	1	03/23/2020 08:14	WG1448460
Chlorobenzene	ND		0.00321	1	03/23/2020 08:14	WG1448460
Chlorodibromomethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
Chloroethane	ND		0.00642	1	03/23/2020 08:14	WG1448460
Chloroform	ND		0.00321	1	03/23/2020 08:14	WG1448460
Chloromethane	ND		0.0160	1	03/23/2020 08:14	WG1448460
2-Chlorotoluene	ND		0.00321	1	03/23/2020 08:14	WG1448460
4-Chlorotoluene	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,2-Dibromo-3-Chloropropane	ND		0.0321	1	03/23/2020 08:14	WG1448460
1,2-Dibromoethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
Dibromomethane	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,2-Dichlorobenzene	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,3-Dichlorobenzene	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,4-Dichlorobenzene	ND		0.00642	1	03/23/2020 08:14	WG1448460
Dichlorodifluoromethane	ND	J0	0.00321	1	03/23/2020 08:14	WG1448460
1,1-Dichloroethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
1,2-Dichloroethane	ND		0.00321	1	03/23/2020 08:14	WG1448460

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		0.00321	1	03/23/2020 08:14	WG1448460
cis-1,2-Dichloroethene	ND		0.00321	1	03/23/2020 08:14	WG1448460
trans-1,2-Dichloroethene	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,2-Dichloropropane	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,1-Dichloropropene	ND		0.00321	1	03/23/2020 08:14	WG1448460
1,3-Dichloropropane	ND		0.00642	1	03/23/2020 08:14	WG1448460
cis-1,3-Dichloropropene	ND		0.00321	1	03/23/2020 08:14	WG1448460
trans-1,3-Dichloropropene	ND		0.00642	1	03/23/2020 08:14	WG1448460
2,2-Dichloropropane	ND		0.00321	1	03/23/2020 08:14	WG1448460
Di-isopropyl ether	ND		0.00128	1	03/23/2020 08:14	WG1448460
Ethylbenzene	ND		0.00321	1	03/23/2020 08:14	WG1448460
Hexachloro-1,3-butadiene	ND		0.0321	1	03/23/2020 08:14	WG1448460
Isopropylbenzene	ND		0.00321	1	03/23/2020 08:14	WG1448460
p-Isopropyltoluene	ND	J0	0.00642	1	03/23/2020 08:14	WG1448460
2-Butanone (MEK)	0.0575	B	0.0321	1	03/23/2020 08:14	WG1448460
Methylene Chloride	ND		0.0321	1	03/23/2020 08:14	WG1448460
4-Methyl-2-pentanone (MIBK)	ND		0.0321	1	03/23/2020 08:14	WG1448460
Methyl tert-butyl ether	ND		0.00128	1	03/23/2020 08:14	WG1448460
Naphthalene	ND	J0	0.0160	1	03/23/2020 08:14	WG1448460
n-Propylbenzene	ND	J0	0.00642	1	03/23/2020 08:14	WG1448460
Styrene	ND		0.0160	1	03/23/2020 08:14	WG1448460
1,1,1,2-Tetrachloroethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
1,1,2,2-Tetrachloroethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
1,1,2-Trichlorotrifluoroethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
Tetrachloroethene	ND		0.00321	1	03/23/2020 08:14	WG1448460
Toluene	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,2,3-Trichlorobenzene	ND		0.0160	1	03/23/2020 08:14	WG1448460
1,2,4-Trichlorobenzene	ND		0.0160	1	03/23/2020 08:14	WG1448460
1,1,1-Trichloroethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
1,1,2-Trichloroethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
Trichloroethene	ND		0.00128	1	03/23/2020 08:14	WG1448460
Trichlorofluoromethane	ND		0.00321	1	03/23/2020 08:14	WG1448460
1,2,3-Trichloropropane	ND		0.0160	1	03/23/2020 08:14	WG1448460
1,2,4-Trimethylbenzene	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,2,3-Trimethylbenzene	ND		0.00642	1	03/23/2020 08:14	WG1448460
1,3,5-Trimethylbenzene	ND		0.00642	1	03/23/2020 08:14	WG1448460
Vinyl chloride	ND		0.00321	1	03/23/2020 08:14	WG1448460
Xylenes, Total	ND		0.00835	1	03/23/2020 08:14	WG1448460
(S) Toluene-d8	*105*		*75.0-131*		*03/23/2020 08:14*	WG1448460
(S) 4-Bromofluorobenzene	*93.5*		*67.0-138*		*03/23/2020 08:14*	WG1448460
(S) 1,2-Dichloroethane-d4	*108*		*70.0-130*		*03/23/2020 08:14*	WG1448460

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	ND		5.14	1	03/25/2020 13:56	WG1448874
Residual Range Organics (RRO)	13.5		12.8	1	03/25/2020 13:56	WG1448874
(S) o-Terphenyl	*52.4*		*18.0-148*		*03/25/2020 13:56*	WG1448874

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	87.4		1	03/24/2020 07:44	WG1448582

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0343	1	03/24/2020 18:40	WG1448314

Metals (ICPMS) by Method 6020B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	3.25		0.572	5	03/23/2020 15:48	WG1448041
Barium	203		1.14	5	03/23/2020 15:48	WG1448041
Cadmium	ND		0.572	5	03/23/2020 15:48	WG1448041
Chromium	11.3		1.14	5	03/23/2020 15:48	WG1448041
Lead	15.8		0.572	5	03/23/2020 15:48	WG1448041
Selenium	ND		0.572	5	03/23/2020 20:58	WG1448041
Silver	ND		0.572	5	03/23/2020 15:48	WG1448041

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		2.86	25	03/22/2020 22:05	WG1448533
(S) a,a,a-Trifluorotoluene(FID)	*98.3*		*77.0-120*		*03/22/2020 22:05*	WG1448533

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	J0	0.0286	1	03/23/2020 08:33	WG1448460
Acrylonitrile	ND		0.0143	1	03/23/2020 08:33	WG1448460
Benzene	ND		0.00114	1	03/23/2020 08:33	WG1448460
Bromobenzene	ND		0.0143	1	03/23/2020 08:33	WG1448460
Bromodichloromethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
Bromoform	ND		0.0286	1	03/23/2020 08:33	WG1448460
Bromomethane	ND		0.0143	1	03/23/2020 08:33	WG1448460
n-Butylbenzene	ND	J0	0.0143	1	03/23/2020 08:33	WG1448460
sec-Butylbenzene	ND		0.0143	1	03/23/2020 08:33	WG1448460
tert-Butylbenzene	ND		0.00572	1	03/23/2020 08:33	WG1448460
Carbon tetrachloride	ND		0.00572	1	03/23/2020 08:33	WG1448460
Chlorobenzene	ND		0.00286	1	03/23/2020 08:33	WG1448460
Chlorodibromomethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
Chloroethane	ND		0.00572	1	03/23/2020 08:33	WG1448460
Chloroform	ND		0.00286	1	03/23/2020 08:33	WG1448460
Chloromethane	ND		0.0143	1	03/23/2020 08:33	WG1448460
2-Chlorotoluene	ND		0.00286	1	03/23/2020 08:33	WG1448460
4-Chlorotoluene	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,2-Dibromo-3-Chloropropane	ND		0.0286	1	03/23/2020 08:33	WG1448460
1,2-Dibromoethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
Dibromomethane	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,2-Dichlorobenzene	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,3-Dichlorobenzene	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,4-Dichlorobenzene	ND		0.00572	1	03/23/2020 08:33	WG1448460
Dichlorodifluoromethane	ND	J0	0.00286	1	03/23/2020 08:33	WG1448460
1,1-Dichloroethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
1,2-Dichloroethane	ND		0.00286	1	03/23/2020 08:33	WG1448460

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		0.00286	1	03/23/2020 08:33	WG1448460
cis-1,2-Dichloroethene	ND		0.00286	1	03/23/2020 08:33	WG1448460
trans-1,2-Dichloroethene	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,2-Dichloropropane	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,1-Dichloropropene	ND		0.00286	1	03/23/2020 08:33	WG1448460
1,3-Dichloropropane	ND		0.00572	1	03/23/2020 08:33	WG1448460
cis-1,3-Dichloropropene	ND		0.00286	1	03/23/2020 08:33	WG1448460
trans-1,3-Dichloropropene	ND		0.00572	1	03/23/2020 08:33	WG1448460
2,2-Dichloropropane	ND		0.00286	1	03/23/2020 08:33	WG1448460
Di-isopropyl ether	ND		0.00114	1	03/23/2020 08:33	WG1448460
Ethylbenzene	ND		0.00286	1	03/23/2020 08:33	WG1448460
Hexachloro-1,3-butadiene	ND		0.0286	1	03/23/2020 08:33	WG1448460
Isopropylbenzene	ND		0.00286	1	03/23/2020 08:33	WG1448460
p-Isopropyltoluene	ND	J0	0.00572	1	03/23/2020 08:33	WG1448460
2-Butanone (MEK)	0.0551	B	0.0286	1	03/23/2020 08:33	WG1448460
Methylene Chloride	ND		0.0286	1	03/23/2020 08:33	WG1448460
4-Methyl-2-pentanone (MIBK)	ND		0.0286	1	03/23/2020 08:33	WG1448460
Methyl tert-butyl ether	ND		0.00114	1	03/23/2020 08:33	WG1448460
Naphthalene	ND	J0	0.0143	1	03/23/2020 08:33	WG1448460
n-Propylbenzene	ND	J0	0.00572	1	03/23/2020 08:33	WG1448460
Styrene	ND		0.0143	1	03/23/2020 08:33	WG1448460
1,1,1,2-Tetrachloroethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
1,1,2,2-Tetrachloroethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
1,1,2-Trichlorotrifluoroethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
Tetrachloroethene	ND		0.00286	1	03/23/2020 08:33	WG1448460
Toluene	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,2,3-Trichlorobenzene	ND		0.0143	1	03/23/2020 08:33	WG1448460
1,2,4-Trichlorobenzene	ND		0.0143	1	03/23/2020 08:33	WG1448460
1,1,1-Trichloroethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
1,1,2-Trichloroethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
Trichloroethene	ND		0.00114	1	03/23/2020 08:33	WG1448460
Trichlorofluoromethane	ND		0.00286	1	03/23/2020 08:33	WG1448460
1,2,3-Trichloropropane	ND		0.0143	1	03/23/2020 08:33	WG1448460
1,2,4-Trimethylbenzene	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,2,3-Trimethylbenzene	ND		0.00572	1	03/23/2020 08:33	WG1448460
1,3,5-Trimethylbenzene	ND		0.00572	1	03/23/2020 08:33	WG1448460
Vinyl chloride	ND		0.00286	1	03/23/2020 08:33	WG1448460
Xylenes, Total	ND		0.00743	1	03/23/2020 08:33	WG1448460
(S) Toluene-d8	*113*		*75.0-131*		*03/23/2020 08:33*	WG1448460
(S) 4-Bromofluorobenzene	*92.2*		*67.0-138*		*03/23/2020 08:33*	WG1448460
(S) 1,2-Dichloroethane-d4	*102*		*70.0-130*		*03/23/2020 08:33*	WG1448460

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	ND		4.58	1	03/27/2020 01:34	WG1450328
Residual Range Organics (RRO)	ND		11.4	1	03/27/2020 01:34	WG1450328
(S) o-Terphenyl	*55.3*		*18.0-148*		*03/27/2020 01:34*	WG1450328

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	82.5		1	03/24/2020 07:44	WG1448582

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.102		0.0364	1	03/24/2020 18:42	WG1448314

Metals (ICPMS) by Method 6020B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	4.22		0.606	5	03/23/2020 15:52	WG1448041
Barium	245		1.21	5	03/23/2020 15:52	WG1448041
Cadmium	ND		0.606	5	03/23/2020 15:52	WG1448041
Chromium	16.4		1.21	5	03/23/2020 15:52	WG1448041
Lead	171		0.606	5	03/23/2020 15:52	WG1448041
Selenium	ND		0.606	5	03/23/2020 21:01	WG1448041
Silver	ND		0.606	5	03/23/2020 15:52	WG1448041

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		3.03	25	03/22/2020 22:25	WG1448533
(S) a,a,a-Trifluorotoluene(FID)	*97.4*		*77.0-120*		*03/22/2020 22:25*	WG1448533

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	J0	0.0303	1	03/23/2020 08:52	WG1448460
Acrylonitrile	ND		0.0151	1	03/23/2020 08:52	WG1448460
Benzene	ND		0.00121	1	03/23/2020 08:52	WG1448460
Bromobenzene	ND		0.0151	1	03/23/2020 08:52	WG1448460
Bromodichloromethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
Bromoform	ND		0.0303	1	03/23/2020 08:52	WG1448460
Bromomethane	ND		0.0151	1	03/23/2020 08:52	WG1448460
n-Butylbenzene	ND	J0	0.0151	1	03/23/2020 08:52	WG1448460
sec-Butylbenzene	ND		0.0151	1	03/23/2020 08:52	WG1448460
tert-Butylbenzene	ND		0.00606	1	03/23/2020 08:52	WG1448460
Carbon tetrachloride	ND		0.00606	1	03/23/2020 08:52	WG1448460
Chlorobenzene	ND		0.00303	1	03/23/2020 08:52	WG1448460
Chlorodibromomethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
Chloroethane	ND		0.00606	1	03/23/2020 08:52	WG1448460
Chloroform	ND		0.00303	1	03/23/2020 08:52	WG1448460
Chloromethane	ND		0.0151	1	03/23/2020 08:52	WG1448460
2-Chlorotoluene	ND		0.00303	1	03/23/2020 08:52	WG1448460
4-Chlorotoluene	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,2-Dibromo-3-Chloropropane	ND		0.0303	1	03/23/2020 08:52	WG1448460
1,2-Dibromoethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
Dibromomethane	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,2-Dichlorobenzene	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,3-Dichlorobenzene	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,4-Dichlorobenzene	ND		0.00606	1	03/23/2020 08:52	WG1448460
Dichlorodifluoromethane	ND	J0	0.00303	1	03/23/2020 08:52	WG1448460
1,1-Dichloroethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
1,2-Dichloroethane	ND		0.00303	1	03/23/2020 08:52	WG1448460

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		0.00303	1	03/23/2020 08:52	WG1448460
cis-1,2-Dichloroethene	ND		0.00303	1	03/23/2020 08:52	WG1448460
trans-1,2-Dichloroethene	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,2-Dichloropropane	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,1-Dichloropropene	ND		0.00303	1	03/23/2020 08:52	WG1448460
1,3-Dichloropropane	ND		0.00606	1	03/23/2020 08:52	WG1448460
cis-1,3-Dichloropropene	ND		0.00303	1	03/23/2020 08:52	WG1448460
trans-1,3-Dichloropropene	ND		0.00606	1	03/23/2020 08:52	WG1448460
2,2-Dichloropropane	ND		0.00303	1	03/23/2020 08:52	WG1448460
Di-isopropyl ether	ND		0.00121	1	03/23/2020 08:52	WG1448460
Ethylbenzene	ND		0.00303	1	03/23/2020 08:52	WG1448460
Hexachloro-1,3-butadiene	ND		0.0303	1	03/23/2020 08:52	WG1448460
Isopropylbenzene	ND		0.00303	1	03/23/2020 08:52	WG1448460
p-Isopropyltoluene	ND	J0	0.00606	1	03/23/2020 08:52	WG1448460
2-Butanone (MEK)	0.0595	B	0.0303	1	03/23/2020 08:52	WG1448460
Methylene Chloride	ND		0.0303	1	03/23/2020 08:52	WG1448460
4-Methyl-2-pentanone (MIBK)	ND		0.0303	1	03/23/2020 08:52	WG1448460
Methyl tert-butyl ether	ND		0.00121	1	03/23/2020 08:52	WG1448460
Naphthalene	ND	J0	0.0151	1	03/23/2020 08:52	WG1448460
n-Propylbenzene	ND	J0	0.00606	1	03/23/2020 08:52	WG1448460
Styrene	ND		0.0151	1	03/23/2020 08:52	WG1448460
1,1,1,2-Tetrachloroethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
1,1,2,2-Tetrachloroethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
1,1,2-Trichlorotrifluoroethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
Tetrachloroethene	ND		0.00303	1	03/23/2020 08:52	WG1448460
Toluene	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,2,3-Trichlorobenzene	ND		0.0151	1	03/23/2020 08:52	WG1448460
1,2,4-Trichlorobenzene	ND		0.0151	1	03/23/2020 08:52	WG1448460
1,1,1-Trichloroethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
1,1,2-Trichloroethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
Trichloroethene	ND		0.00121	1	03/23/2020 08:52	WG1448460
Trichlorofluoromethane	ND		0.00303	1	03/23/2020 08:52	WG1448460
1,2,3-Trichloropropane	ND		0.0151	1	03/23/2020 08:52	WG1448460
1,2,4-Trimethylbenzene	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,2,3-Trimethylbenzene	ND		0.00606	1	03/23/2020 08:52	WG1448460
1,3,5-Trimethylbenzene	ND		0.00606	1	03/23/2020 08:52	WG1448460
Vinyl chloride	ND		0.00303	1	03/23/2020 08:52	WG1448460
Xylenes, Total	ND		0.00788	1	03/23/2020 08:52	WG1448460
(S) Toluene-d8	*122*		*75.0-131*		*03/23/2020 08:52*	WG1448460
(S) 4-Bromofluorobenzene	*94.4*		*67.0-138*		*03/23/2020 08:52*	WG1448460
(S) 1,2-Dichloroethane-d4	*103*		*70.0-130*		*03/23/2020 08:52*	WG1448460

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	ND		4.85	1	03/27/2020 06:11	WG1450328
Residual Range Organics (RRO)	ND		12.1	1	03/27/2020 06:11	WG1450328
(S) o-Terphenyl	*45.0*		*18.0-148*		*03/27/2020 06:11*	WG1450328

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	82.3		1	03/24/2020 07:44	WG1448582

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0365	1	03/24/2020 18:45	WG1448314

Metals (ICPMS) by Method 6020B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	4.50		0.608	5	03/23/2020 16:02	WG1448041
Barium	202		1.22	5	03/23/2020 16:02	WG1448041
Cadmium	ND		0.608	5	03/23/2020 16:02	WG1448041
Chromium	15.8		1.22	5	03/23/2020 16:02	WG1448041
Lead	9.24		0.608	5	03/23/2020 16:02	WG1448041
Selenium	ND		0.608	5	03/23/2020 21:05	WG1448041
Silver	ND		0.608	5	03/23/2020 16:02	WG1448041

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		3.04	25	03/22/2020 22:46	WG1448533
(S) a,a,a-Trifluorotoluene(FID)	*98.4*		*77.0-120*		*03/22/2020 22:46*	WG1448533

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	J0	0.0304	1	03/23/2020 09:11	WG1448460
Acrylonitrile	ND		0.0152	1	03/23/2020 09:11	WG1448460
Benzene	ND		0.00122	1	03/23/2020 09:11	WG1448460
Bromobenzene	ND		0.0152	1	03/23/2020 09:11	WG1448460
Bromodichloromethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
Bromoform	ND		0.0304	1	03/23/2020 09:11	WG1448460
Bromomethane	ND		0.0152	1	03/23/2020 09:11	WG1448460
n-Butylbenzene	ND	J0	0.0152	1	03/23/2020 09:11	WG1448460
sec-Butylbenzene	ND		0.0152	1	03/23/2020 09:11	WG1448460
tert-Butylbenzene	ND		0.00608	1	03/23/2020 09:11	WG1448460
Carbon tetrachloride	ND		0.00608	1	03/23/2020 09:11	WG1448460
Chlorobenzene	ND		0.00304	1	03/23/2020 09:11	WG1448460
Chlorodibromomethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
Chloroethane	ND		0.00608	1	03/23/2020 09:11	WG1448460
Chloroform	ND		0.00304	1	03/23/2020 09:11	WG1448460
Chloromethane	ND		0.0152	1	03/23/2020 09:11	WG1448460
2-Chlorotoluene	ND		0.00304	1	03/23/2020 09:11	WG1448460
4-Chlorotoluene	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,2-Dibromo-3-Chloropropane	ND		0.0304	1	03/23/2020 09:11	WG1448460
1,2-Dibromoethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
Dibromomethane	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,2-Dichlorobenzene	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,3-Dichlorobenzene	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,4-Dichlorobenzene	ND		0.00608	1	03/23/2020 09:11	WG1448460
Dichlorodifluoromethane	ND	J0	0.00304	1	03/23/2020 09:11	WG1448460
1,1-Dichloroethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
1,2-Dichloroethane	ND		0.00304	1	03/23/2020 09:11	WG1448460

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		0.00304	1	03/23/2020 09:11	WG1448460
cis-1,2-Dichloroethene	ND		0.00304	1	03/23/2020 09:11	WG1448460
trans-1,2-Dichloroethene	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,2-Dichloropropane	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,1-Dichloropropene	ND		0.00304	1	03/23/2020 09:11	WG1448460
1,3-Dichloropropane	ND		0.00608	1	03/23/2020 09:11	WG1448460
cis-1,3-Dichloropropene	ND		0.00304	1	03/23/2020 09:11	WG1448460
trans-1,3-Dichloropropene	ND		0.00608	1	03/23/2020 09:11	WG1448460
2,2-Dichloropropane	ND		0.00304	1	03/23/2020 09:11	WG1448460
Di-isopropyl ether	ND		0.00122	1	03/23/2020 09:11	WG1448460
Ethylbenzene	ND		0.00304	1	03/23/2020 09:11	WG1448460
Hexachloro-1,3-butadiene	ND		0.0304	1	03/23/2020 09:11	WG1448460
Isopropylbenzene	ND		0.00304	1	03/23/2020 09:11	WG1448460
p-Isopropyltoluene	ND	J0	0.00608	1	03/23/2020 09:11	WG1448460
2-Butanone (MEK)	0.0638	B	0.0304	1	03/23/2020 09:11	WG1448460
Methylene Chloride	ND		0.0304	1	03/23/2020 09:11	WG1448460
4-Methyl-2-pentanone (MIBK)	ND		0.0304	1	03/23/2020 09:11	WG1448460
Methyl tert-butyl ether	ND		0.00122	1	03/23/2020 09:11	WG1448460
Naphthalene	ND	J0	0.0152	1	03/23/2020 09:11	WG1448460
n-Propylbenzene	ND	J0	0.00608	1	03/23/2020 09:11	WG1448460
Styrene	ND		0.0152	1	03/23/2020 09:11	WG1448460
1,1,1,2-Tetrachloroethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
1,1,2,2-Tetrachloroethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
1,1,2-Trichlorotrifluoroethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
Tetrachloroethene	ND		0.00304	1	03/23/2020 09:11	WG1448460
Toluene	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,2,3-Trichlorobenzene	ND		0.0152	1	03/23/2020 09:11	WG1448460
1,2,4-Trichlorobenzene	ND		0.0152	1	03/23/2020 09:11	WG1448460
1,1,1-Trichloroethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
1,1,2-Trichloroethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
Trichloroethene	ND		0.00122	1	03/23/2020 09:11	WG1448460
Trichlorofluoromethane	ND		0.00304	1	03/23/2020 09:11	WG1448460
1,2,3-Trichloropropane	ND		0.0152	1	03/23/2020 09:11	WG1448460
1,2,4-Trimethylbenzene	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,2,3-Trimethylbenzene	ND		0.00608	1	03/23/2020 09:11	WG1448460
1,3,5-Trimethylbenzene	ND		0.00608	1	03/23/2020 09:11	WG1448460
Vinyl chloride	ND		0.00304	1	03/23/2020 09:11	WG1448460
Xylenes, Total	ND		0.00790	1	03/23/2020 09:11	WG1448460
(S) Toluene-d8	*101*		*75.0-131*		*03/23/2020 09:11*	WG1448460
(S) 4-Bromofluorobenzene	*78.9*		*67.0-138*		*03/23/2020 09:11*	WG1448460
(S) 1,2-Dichloroethane-d4	*107*		*70.0-130*		*03/23/2020 09:11*	WG1448460

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	6.88		4.86	1	03/25/2020 14:08	WG1448874
Residual Range Organics (RRO)	39.6		12.2	1	03/25/2020 14:08	WG1448874
(S) o-Terphenyl	*45.7*		*18.0-148*		*03/25/2020 14:08*	WG1448874

Method Blank (MB)

(MB) R3512262-1 03/24/20 07:44

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000			

L1201489-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1201489-01 03/24/20 07:44 • (DUP) R3512262-3 03/24/20 07:44

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	86.2	85.9	1	0.290		10

Laboratory Control Sample (LCS)

(LCS) R3512262-2 03/24/20 07:44

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

Method Blank (MB)

(MB) R3512096-1 03/24/20 17:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	0.00281	J	0.00280	0.0300

Laboratory Control Sample (LCS)

(LCS) R3512096-2 03/24/20 17:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.537	107	80.0-120	

L1201390-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1201390-06 03/24/20 17:41 • (MS) R3512096-3 03/24/20 17:44 • (MSD) R3512096-4 03/24/20 17:46

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 %
Mercury	0.500	0.0100	0.470	0.498	91.9	97.5	1	75.0-125			5.79	20

Method Blank (MB)

(MB) R3511632-1 03/23/20 14:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.125	0.500
Barium	U		0.160	1.00
Cadmium	U		0.0800	0.500
Chromium	U		0.270	1.00
Lead	U		0.120	0.500
Silver	U		0.155	0.500

Method Blank (MB)

(MB) R3511681-1 03/23/20 20:02

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Selenium	U		0.190	0.500

Laboratory Control Sample (LCS)

(LCS) R3511632-2 03/23/20 14:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	88.5	88.5	80.0-120	
Barium	100	93.1	93.1	80.0-120	
Cadmium	100	93.6	93.6	80.0-120	
Chromium	100	89.8	89.8	80.0-120	
Lead	100	92.4	92.4	80.0-120	
Silver	20.0	19.5	97.4	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3511681-2 03/23/20 20:06

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Selenium	100	85.1	85.1	80.0-120	

L1201289-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1201289-03 03/23/20 14:46 • (MS) R3511632-5 03/23/20 14:57 • (MSD) R3511632-6 03/23/20 15:00

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 %
Arsenic	20.0	0.761	90.0	87.4	89.3	86.7	5	75.0-125			2.93	20
Barium	20.0	21.8	120	115	98.2	92.8	5	75.0-125			4.64	20
Cadmium	20.0	U	96.6	96.2	96.6	96.2	5	75.0-125			0.394	20
Chromium	20.0	6.16	98.9	96.7	92.7	90.5	5	75.0-125			2.23	20
Lead	20.0	7.85	102	103	94.6	95.6	5	75.0-125			1.01	20
Silver	4.00	U	20.4	20.1	102	101	5	75.0-125			1.14	20

L1201289-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1201289-03 03/23/20 21:22 • (MS) R3511681-6 03/23/20 21:36 • (MSD) R3511681-4 03/23/20 20:23

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 %
Selenium	20.0	0.209	89.3	88.2	89.1	88.0	5	75.0-125			1.27	20

Method Blank (MB)

(MB) R3511647-1 03/23/20 14:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.125	0.500
Barium	U		0.160	1.00
Cadmium	U		0.0800	0.500
Chromium	U		0.270	1.00
Lead	U		0.120	0.500
Selenium	U		0.190	0.500
Silver	U		0.155	0.500

Laboratory Control Sample (LCS)

(LCS) R3511647-2 03/23/20 14:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	87.0	87.0	80.0-120	
Barium	100	87.7	87.7	80.0-120	
Cadmium	100	96.0	96.0	80.0-120	
Chromium	100	93.0	93.0	80.0-120	
Lead	100	91.8	91.8	80.0-120	
Selenium	100	94.4	94.4	80.0-120	
Silver	20.0	19.6	98.1	80.0-120	

L1201489-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1201489-01 03/23/20 14:42 • (MS) R3511647-5 03/23/20 14:52 • (MSD) R3511647-6 03/23/20 14:55

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	23.2	5.25	98.8	87.7	80.6	71.1	5	75.0-125		J6	11.9	20
Barium	23.2	195	305	348	94.7	132	5	75.0-125		J5	13.1	20
Cadmium	23.2	0.627	107	97.8	91.8	83.7	5	75.0-125			9.10	20
Chromium	23.2	22.5	116	106	80.3	72.0	5	75.0-125		J6	8.64	20
Lead	23.2	171	231	262	52.1	78.3	5	75.0-125	J6		12.3	20
Selenium	23.2	ND	104	92.9	89.4	79.6	5	75.0-125			11.5	20
Silver	4.64	ND	21.8	20.0	94.0	86.3	5	75.0-125			8.47	20

Method Blank (MB)

(MB) R3512725-2 03/22/20 19:51

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Gasoline Range Organics-NWTPH	U		0.0339	0.100
(S) a,a,a-Trifluorotoluene(FID)	*98.4*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R3512725-1 03/22/20 19:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Gasoline Range Organics-NWTPH	5.50	5.02	91.3	71.0-124	
(S) a,a,a-Trifluorotoluene(FID)			*109*	*77.0-120*	

Method Blank (MB)

(MB) R3512652-2 03/23/20 05:02

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0137	0.0250
Acrylonitrile	U		0.00190	0.0125
Benzene	U		0.000400	0.00100
Bromobenzene	U		0.00105	0.0125
Bromodichloromethane	U		0.000788	0.00250
Bromoform	U		0.00598	0.0250
Bromomethane	U		0.00370	0.0125
n-Butylbenzene	U		0.00384	0.0125
sec-Butylbenzene	U		0.00253	0.0125
tert-Butylbenzene	U		0.00155	0.00500
Carbon tetrachloride	U		0.00108	0.00500
Chlorobenzene	U		0.000573	0.00250
Chlorodibromomethane	U		0.000450	0.00250
Chloroethane	U		0.00108	0.00500
Chloroform	U		0.000415	0.00250
Chloromethane	U		0.00139	0.0125
2-Chlorotoluene	U		0.000920	0.00250
4-Chlorotoluene	U		0.00113	0.00500
1,2-Dibromo-3-Chloropropane	U		0.00510	0.0250
1,2-Dibromoethane	U		0.000525	0.00250
Dibromomethane	U		0.00100	0.00500
1,2-Dichlorobenzene	U		0.00145	0.00500
1,3-Dichlorobenzene	U		0.00170	0.00500
1,4-Dichlorobenzene	U		0.00197	0.00500
Dichlorodifluoromethane	U		0.000818	0.00250
1,1-Dichloroethane	U		0.000575	0.00250
1,2-Dichloroethane	U		0.000475	0.00250
1,1-Dichloroethene	U		0.000500	0.00250
cis-1,2-Dichloroethene	U		0.000690	0.00250
trans-1,2-Dichloroethene	U		0.00143	0.00500
1,2-Dichloropropane	U		0.00127	0.00500
1,1-Dichloropropene	U		0.000700	0.00250
1,3-Dichloropropane	U		0.00175	0.00500
cis-1,3-Dichloropropene	U		0.000678	0.00250
trans-1,3-Dichloropropene	U		0.00153	0.00500
2,2-Dichloropropane	U		0.000793	0.00250
Di-isopropyl ether	U		0.000350	0.00100
Ethylbenzene	U		0.000530	0.00250
Hexachloro-1,3-butadiene	U		0.0127	0.0250
Isopropylbenzene	U		0.000863	0.00250

Method Blank (MB)

(MB) R3512652-2 03/23/20 05:02

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.00233	0.00500
2-Butanone (MEK)	0.0317		0.0125	0.0250
Methylene Chloride	U		0.00664	0.0250
4-Methyl-2-pentanone (MIBK)	U		0.0100	0.0250
Methyl tert-butyl ether	U		0.000295	0.00100
Naphthalene	U		0.00312	0.0125
n-Propylbenzene	U		0.00118	0.00500
Styrene	U		0.00273	0.0125
1,1,1,2-Tetrachloroethane	U		0.000500	0.00250
1,1,2,2-Tetrachloroethane	U		0.000390	0.00250
Tetrachloroethene	U		0.000700	0.00250
Toluene	U		0.00125	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000675	0.00250
1,2,3-Trichlorobenzene	U		0.000625	0.0125
1,2,4-Trichlorobenzene	U		0.00482	0.0125
1,1,1-Trichloroethane	U		0.000275	0.00250
1,1,2-Trichloroethane	U		0.000883	0.00250
Trichloroethene	U		0.000400	0.00100
Trichlorofluoromethane	U		0.000500	0.00250
1,2,3-Trichloropropane	U		0.00510	0.0125
1,2,3-Trimethylbenzene	U		0.00115	0.00500
1,2,4-Trimethylbenzene	U		0.00116	0.00500
1,3,5-Trimethylbenzene	U		0.00108	0.00500
Vinyl chloride	U		0.000683	0.00250
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	*104*			*75.0-131*
(S) 4-Bromofluorobenzene	*95.9*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3512652-1 03/23/20 03:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetone	0.625	0.676	108	10.0-160	
Acrylonitrile	0.625	0.794	127	45.0-153	
Benzene	0.125	0.112	89.6	70.0-123	
Bromobenzene	0.125	0.144	115	73.0-121	
Bromodichloromethane	0.125	0.116	92.8	73.0-121	

Laboratory Control Sample (LCS)

(LCS) R3512652-1 03/23/20 03:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromoform	0.125	0.129	103	64.0-132	
Bromomethane	0.125	0.146	117	56.0-147	
n-Butylbenzene	0.125	0.100	80.0	68.0-135	
sec-Butylbenzene	0.125	0.117	93.6	74.0-130	
tert-Butylbenzene	0.125	0.125	100	75.0-127	
Carbon tetrachloride	0.125	0.146	117	66.0-128	
Chlorobenzene	0.125	0.122	97.6	76.0-128	
Chlorodibromomethane	0.125	0.120	96.0	74.0-127	
Chloroethane	0.125	0.152	122	61.0-134	
Chloroform	0.125	0.134	107	72.0-123	
Chloromethane	0.125	0.123	98.4	51.0-138	
2-Chlorotoluene	0.125	0.100	80.0	75.0-124	
4-Chlorotoluene	0.125	0.115	92.0	75.0-124	
1,2-Dibromo-3-Chloropropane	0.125	0.105	84.0	59.0-130	
1,2-Dibromoethane	0.125	0.115	92.0	74.0-128	
Dibromomethane	0.125	0.125	100	75.0-122	
1,2-Dichlorobenzene	0.125	0.132	106	76.0-124	
1,3-Dichlorobenzene	0.125	0.119	95.2	76.0-125	
1,4-Dichlorobenzene	0.125	0.123	98.4	77.0-121	
Dichlorodifluoromethane	0.125	0.0797	63.8	43.0-156	
1,1-Dichloroethane	0.125	0.120	96.0	70.0-127	
1,2-Dichloroethane	0.125	0.129	103	65.0-131	
1,1-Dichloroethene	0.125	0.116	92.8	65.0-131	
cis-1,2-Dichloroethene	0.125	0.140	112	73.0-125	
trans-1,2-Dichloroethene	0.125	0.111	88.8	71.0-125	
1,2-Dichloropropane	0.125	0.0932	74.6	74.0-125	
1,1-Dichloropropene	0.125	0.0949	75.9	73.0-125	
1,3-Dichloropropane	0.125	0.119	95.2	80.0-125	
cis-1,3-Dichloropropene	0.125	0.109	87.2	76.0-127	
trans-1,3-Dichloropropene	0.125	0.120	96.0	73.0-127	
2,2-Dichloropropane	0.125	0.128	102	59.0-135	
Di-isopropyl ether	0.125	0.130	104	60.0-136	
Ethylbenzene	0.125	0.105	84.0	74.0-126	
Hexachloro-1,3-butadiene	0.125	0.137	110	57.0-150	
Isopropylbenzene	0.125	0.105	84.0	72.0-127	
p-Isopropyltoluene	0.125	0.104	83.2	72.0-133	
2-Butanone (MEK)	0.625	0.804	129	30.0-160	
Methylene Chloride	0.125	0.123	98.4	68.0-123	
4-Methyl-2-pentanone (MIBK)	0.625	0.749	120	56.0-143	
Methyl tert-butyl ether	0.125	0.135	108	66.0-132	

Laboratory Control Sample (LCS)

(LCS) R3512652-1 03/23/20 03:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Naphthalene	0.125	0.129	103	59.0-130	
n-Propylbenzene	0.125	0.122	97.6	74.0-126	
Styrene	0.125	0.107	85.6	72.0-127	
1,1,1,2-Tetrachloroethane	0.125	0.138	110	74.0-129	
1,1,2,2-Tetrachloroethane	0.125	0.119	95.2	68.0-128	
Tetrachloroethene	0.125	0.148	118	70.0-136	
Toluene	0.125	0.105	84.0	75.0-121	
1,1,2-Trichlorotrifluoroethane	0.125	0.124	99.2	61.0-139	
1,2,3-Trichlorobenzene	0.125	0.154	123	59.0-139	
1,2,4-Trichlorobenzene	0.125	0.127	102	62.0-137	
1,1,1-Trichloroethane	0.125	0.154	123	69.0-126	
1,1,2-Trichloroethane	0.125	0.140	112	78.0-123	
Trichloroethene	0.125	0.126	101	76.0-126	
Trichlorofluoromethane	0.125	0.119	95.2	61.0-142	
1,2,3-Trichloropropane	0.125	0.147	118	67.0-129	
1,2,3-Trimethylbenzene	0.125	0.102	81.6	74.0-124	
1,2,4-Trimethylbenzene	0.125	0.110	88.0	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.125	100	73.0-127	
Vinyl chloride	0.125	0.137	110	63.0-134	
Xylenes, Total	0.375	0.323	86.1	72.0-127	
(S) Toluene-d8			*96.7*	*75.0-131*	
(S) 4-Bromofluorobenzene			*94.4*	*67.0-138*	
(S) 1,2-Dichloroethane-d4			*114*	*70.0-130*	

Method Blank (MB)

(MB) R3512249-1 03/25/20 09:42

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	*62.8*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3512249-2 03/25/20 09:55

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Diesel Range Organics (DRO)	50.0	33.8	67.6	50.0-150	
(S) o-Terphenyl			*55.7*	*18.0-148*	

Method Blank (MB)

(MB) R3513086-1 03/27/20 01:00

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	*51.1*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3513086-2 03/27/20 01:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Diesel Range Organics (DRO)	50.0	41.1	82.2	50.0-150	
(S) o-Terphenyl			*89.5*	*18.0-148*	

L1202427-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202427-01 03/27/20 01:48 • (MS) R3513086-3 03/27/20 02:03 • (MSD) R3513086-4 03/27/20 02:18

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)	66.8	ND	52.8	41.3	78.9	63.2	1	50.0-150		J3	24.4	20
(S) o-Terphenyl					*83.4*	*69.0*		*18.0-148*				

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.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J0	J0: The identification of the analyte is acceptable, but the reported concentration is an estimate. The calibration met method criteria.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
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	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

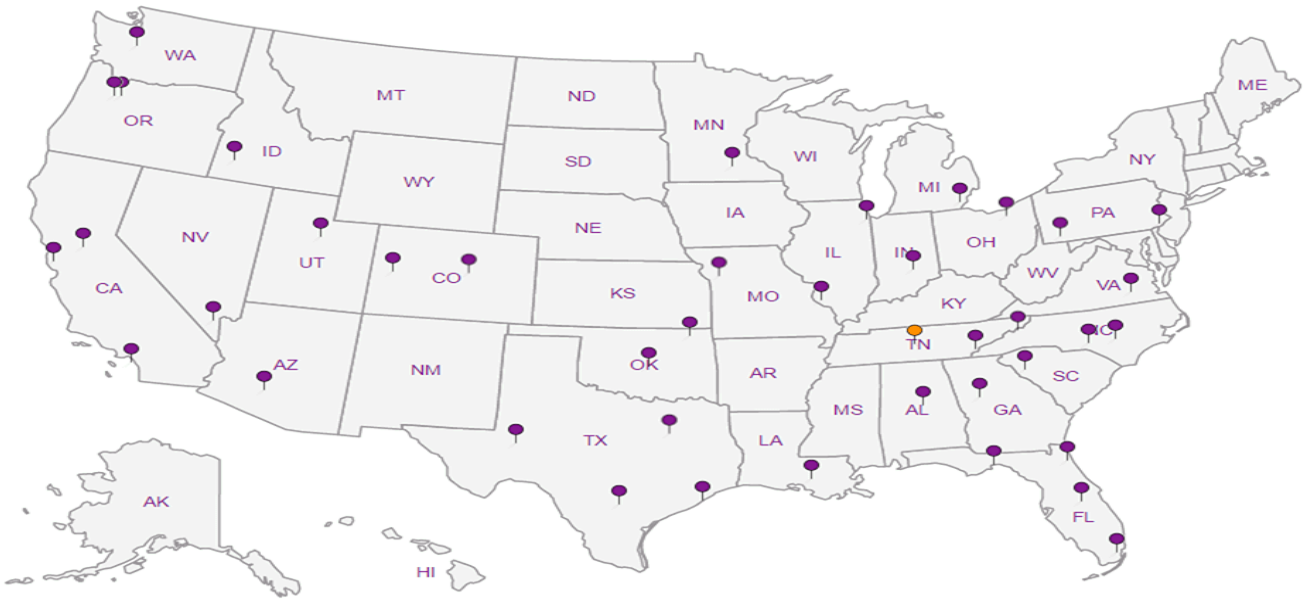
Third Party Federal Accreditations

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



PBS Engineering & Env.- POR

4412 SW Corbett Ave
Portland, OR 97239

Billing Information:
Accounts Payable
4412 SW Corbett Ave
Portland, OR 97239

Report to: Chris Sheridan
Email To: Chris.Sheridan@pbsusa.com

Project Description: Phase II
City/State Collected: Washougal / Washington

Phone: 503-248-1939
Fax: 503-248-0223

Client Project # 24061.000
Lab Project #

Collected by (print): Shad Brooks
Site/Facility ID #
P.O. #

Collected by (signature):
Immediately Packed on Ice N ___ Y X

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

Quote #
Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TPH-Gx	TPH-dlo	VOCs	RCRA 8 Metals	Remarks	Sample # (lab only)
SB-1	G	SS		3/19	1530	3	X	X	X	X		-01
SB-2	G	SS		3/19	1315	3	X	X	X	X		02
SB-3	G	SS		3/19	1120	3	X	X	X	X		03
SB-4	G	SS		3/19	1245	3	X	X	X	X		04
SB-5	G	SS		3/19	1230	3	X	X	X	X		05
SB-6	G	SS		3/19	1100	3	X	X	X	X		06
~~SB-7~~	~~G~~	~~SS~~										
~~Trip Blank~~												

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1261489

E073

Template:
Prelogin:
TSR: 110 - Brian Ford
PB:
Shipped Via:

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 4686 4470 7649

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

RAD SCREEN: <0.5 mR/hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Shad Brooks	3/20/20	1000	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: wet A3 °C
1.1+.1=1.2
Bottles Received: 18

Date: 21MAR
Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK