Risk-Based Assessment Report

801 SW Harvey Milk Street
Portland, Oregon 97205
DEQ LUST File No. 26-22-0048
UST Facility ID 9365

Prepared for:
Multnomah County
401 N Dixon Street
Portland, Oregon 97227

September 2023
PBS Project 15194.889

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1 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) completed a risk-based assessment at 801 SW Harvey Milk Street (Site) in Portland, Oregon. This report summarizes previous work performed at the Site and presents PBS' investigation results and conclusions.

2 ENVIRONMENTAL SETTING

2.1 Topography

The Site is located in a relatively flat area approximately 0.50 mile west of the Willamette River. Its elevation is approximately 50 feet above mean sea level. Topography in the Site vicinity slopes very gently to the east.

2.2 Regional Geology and Hydrogeology

This area is in the central part of Multnomah County in the city of Portland on the first terraces above the flood plains. Surface soil is underlain by alternating sands, clays, and gravels deposited during Pleistocene catastrophic flood events, with sand and gravel of the Troutdale Formation underlying the flood deposits. Columbia River Basalts are present at depth.[1] Based on nearby well and monitoring well logs (or previous on-site investigations), the shallowest occurrence of groundwater is expected to be between 15 and 20 feet below ground surface (bgs), with productive aquifers at greater depths.[2] Based on topography, the direction of shallow, unconfined groundwater flow is expected to be toward the east-northeast.

2.3 Site Ownership and History

The Site was purchased by Multnomah County in July 2022 to provide parking for the adjacent Behavioral Health Resource Center (333 SW Park Avenue), which was purchased and renovated by Multnomah County in 2019. The Site has been in use as a parking lot since 1990. Historical uses of the Site include "pigeon-hole" parking, a hat cleaning business, a gas and oil station, and a restaurant.

3 PREVIOUS ENVIRONMENTAL ASSESSMENTS

3.1 Limited Phase II Environmental Site Assessment (ESA); GeoDesign, 2017

Sub-slab vapor sampling was completed in the north-adjacent 333 SW Park Avenue property by GeoDesign in 2017 during a Phase II Environmental Site Assessment (ESA). GeoDesign drilled three 0.25-inch-diameter holes through the concrete slab of the building. Teflon tubing was inserted into the holes with hydrated bentonite used as a sealant. Two to three volumes of air were purged prior to collecting the sub-slab samples in 1-liter Summa canisters with flow controllers set to less than 200 milliliters per minute. The samples were analyzed for gasoline-range hydrocarbons and volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method TO-15. Samples were collected from the following locations:

- SSV-1 was collected near the western end of the building through the slab of the first floor.
- SSV-2 was collected near the northeast corner of the building through the slab of the basement.
- SSV-3 was collected near the southeast corner of the building through the slab of the basement.

Gasoline-range organics and several VOCs including benzene, chloroform, ethylbenzene, tetrachloroethene (PCE), and trichloroethene (TCE) were detected in the samples. A copy of GeoDesign's Limited Phase II ESA Memorandum, including figures and analytical tables, is included in Appendix A.

[1] DOGAMI (Oregon Department of Geology and Mineral Industries). (1963). *Geologic Map of Oregon*, https://gis.dogami.oregon.gov/maps/geologicmap/.
[2] USGS (United States Geological Survey). (1996). *Description of the Ground-Water Flow System in the Portland Basin, Oregon and Washington.* United States Geological Survey Water-Supply Paper 2470-A.

3.2 Phase I ESA; PBS, 2022

In January 2022, PBS completed a Phase I ESA of the property for the County. The 2022 Phase I ESA identified environmental findings at the Site along with recommended further assessment for the following:

1. The subject property was occupied by a Texaco gas station and a "pigeon-hole" parking garage from at least 1952 through the early 1970s. Two 3,500-gallon gasoline tanks were installed for the gas station in April 1952. The parking garage utilized two tanks containing oil: 90-gallon and 55-gallon oil tanks. No information was found through the State of Oregon Department of Environmental Quality (DEQ) regarding the decommissioning of the tanks. Fire marshal records indicated the size and that three tanks were removed.
2. A hat cleaning business occupied the former commercial building in the 1930s and 1940s. Because dry cleaners historically used chlorinated solvents such as tetrachloroethylene (PCE), this was determined to be a high environmental concern.

3.3 Phase II ESA; PBS, 2022

PBS completed a site assessment of the property to address concerns identified in the Phase I ESA. The site assessment identified the following:

- A geophysical survey detected a large, disturbed soil zone that was likely created from the removal of the former tanks. The disturbance was detected at the southwest corner of the Site and extended beneath the sidewalk of SW 9th Avenue. A copy of the report is provided in Appendix B.
- A smaller subtle soil disturbance containing piping was noted adjacent to a construction trailer, approximately 11 feet north of the SW Harvey Milk Street sidewalk. Access to this area at the time of the investigation was poor and obstructed by the construction trailer and a storage cabinet related to ongoing construction at the 333 SW Park Avenue building. This disturbance was noted to be consistent with the location of the former fuel dispensers as indicated by a historic photograph of the Site from 1955 (Appendix C).
- Six direct-push borings were completed at the Site to evaluate the subsurface for contamination. Petroleum-contaminated soil (PCS) was identified at depth (12 feet bgs) in a boring completed within the former tank pit. As well, distinctly separate heavy oil petroleum contamination was identified in a boring completed in the area of the former fueling station structure and pump islands. PBS also identified diesel- and heavy oil-range soil contamination in shallow soil (1 to 2 feet bgs).
- Although petroleum contamination was identified in soil at several locations across the site, the concentrations did not appear to pose a risk to current or future receptors with the exception of several polycyclic aromatic hydrocarbon (PAH) compounds that were detected in a soil sample collected from boring B-4 at a depth of 8 feet bgs, which exceed DEQ risk-based criteria protective of construction and excavation workers. As petroleum contamination was encountered below a former tank excavation, a release was reported to DEQ in accordance with Oregon Administration Rule (OAR) 340-122-0220. Leaking underground storage tank (LUST) file 26-22-0048 was subsequently opened for the property. Groundwater was not encountered during the investigation.
- As part of the assessment, PBS additionally completed soil gas sampling utilizing downhole sampling equipment provided by the drilling subcontractor. The collected sample was analyzed for gasoline-range petroleum hydrocarbons and VOCs. Gasoline and several gasoline-related individual constituents were detected in this sample. Trichloroethene (TCE), a chemical commonly associated with dry cleaning, was also detected. The detections were found to be well below applicable risk-based concentrations (RBCs) protective of human health, and therefore, an unacceptable vapor intrusion risk was not identified.

Unacceptable risk was not identified during the assessment; however, further lateral delineation of PCS was determined to be necessary for site closure. The drilling investigation is described in additional detail in Section 4.1.

4 FIELD ACTIVITIES

Prior to beginning fieldwork, PBS filed a public utility notification request. A site-specific health and safety plan (HASP) was prepared and reviewed with field personnel and subcontractors before beginning work. A private utility locate and boring clearance was performed Pacific Geophysics of Portland, Oregon, prior to the Phase II investigation, while Alpha Locates of Gaston, Oregon, completed boring clearance prior to the additional assessment work.

4.1 Phase II Environmental Site Assessment (January 2022)

PBS was on site on January 20, 2022, to conduct the drilling investigation, with Cascade Drilling (Cascade) of Clackamas, Oregon, providing drilling services. A direct-push drill rig was used to advance all borings. Photo documentation of field activities is provided in Appendix C.

A total of six borings were advanced during the drilling investigation, each to a total depth of 15 feet bgs. Figure 2 shows the location of the temporary boreholes advanced at the Site. Borings were advanced at the following locations:

- B-1 through B-3 were located within the footprint of the large disturbance detected at the southwest corner of the Site during the geophysical survey.
- Boring B-4 was advanced to the east of the large disturbance and approximately 11 feet north of the SW Harvey Milk Street sidewalk and adjacent to the subtle disturbance containing piping that was detected during the geophysical survey. The location of boring B-4 also appeared to be in the vicinity of the former fuel dispensers, as indicated by a historic photo of the Site from 1955.
- Boring B-5 was located approximately 15 feet northeast of the large disturbance and also in the vicinity of former underground storage tanks (USTs) based on historic site plans for the "pigeon-parking" and fuel station that were provided to PBS by the City of Portland (Appendix D).
- Boring B-6 was advanced in the footprint of the former hat cleaning business as indicated by a historical Sanborn map. The boring was located on the eastern portion of the Site, approximately 40 feet from SW Park Avenue. A copy of the map is included in Appendix D.

A soil gas sample was additionally collected from boring B-6. PBS collected the soil gas sample from boring B-6 using a post-run tubing (PRT) sampling system provided and operated by Cascade. The sample was collected from a depth of 5 feet bgs.

4.2 Additional Assessment (March 2023)

PBS remobilized to the Site on March 2, 2023, to collect additional lateral delineation soil samples. The work was completed with Western States Soil Conservation, Inc. (Western States) of Hubbard, Oregon, providing drilling services. The sampling was completed concurrently with geotechnical infiltration test borings and PBS utilized the on-site hollow-stem auger rig to complete the additional delineation borings as a cost-saving measure for the County.

A total of three borings (B-7, B-8, and B-9) were advanced during the additional assessment, to depths ranging from 10 to 15 feet bgs. Figure 2 shows the location of the temporary boreholes advanced at the site.

Soil samples were collected from each boring using a split-spoon sampler. Photo documentation of field activities is provided in Appendix C.

Sampling and drilling equipment were decontaminated between borings using a detergent wash and tap water rinse. Upon completion of sampling, temporary boreholes were backfilled and sealed with bentonite to 6 inches below grade, and the surface restored to match the surrounding area.

4.3 Sampling Procedures

Soil samples were collected in accordance with PBS' Standard Operating Procedure (SOP) Drilling and Soil Sampling Procedure. The soil gas sample was collected in accordance with PBS' SOP for Sub-Slab and Soil Gas Sampling. Copies of the SOPs are provided in Appendix E. PBS personnel wore new disposable nitrile gloves when collecting samples. Soil samples were collected in laboratory-supplied containers, placed on ice in a cooler, and transported to either Friedman and Bruya in Seattle, Washington, or Apex Laboratories in Tigard, Oregon, with chain-of-custody documentation.

The soil gas sample was collected into a Summa canister obtained from Friedman and Bruya with a flow regulator set to a rate of no more than 200 milliliters per minute. The sample was collected in accordance with Sections 3.2.1 and 3.2.2 of the DEQ vapor intrusion guidance document (VI Guidance) that establishes protocols for collecting sub-slab vapor and soil gas samples.[3] PBS performed leak detection monitoring during sampling using helium as a tracer gas. The sub-slab vapor sample was analyzed for gasoline-range hydrocarbons and VOCs by EPA Method TO-15 and for helium by ASTM D-1946.

Photoionization detector (PID) measurements were taken from soil headspace to assess the presence of volatile contaminants. For the PID screening, soil was collected at approximately 5-foot intervals and placed into disposable zipper-type plastic bags that were sealed, gently shaken, and allowed to reset for 5 to 15 minutes. The PID tip was then inserted into the bag to measure total volatile compounds. Soil samples requiring VOC analysis were field preserved using EPA Method 5035.

Discrete soil samples were collected from each borehole at depths ranging from 2 to 15 feet bgs. Sample depths were determined by several factors including:

- The depth of observed field evidence of contamination.
- The observed transition from suspected fill to native soil (indicating the likely tank bottom depth).
- In the absence of those observations, a shallow sample and a deep sample were collected from each boring.
- For boring B-6, located in the vicinity of the former hat cleaning business, one soil sample was collected at a depth of 2 feet bgs as field evidence (odor, PID detection) indicated potential petroleum contamination in a narrow vertical interval (1 to 2 feet bgs). A deeper sample was collected at a depth of 10 feet bgs to evaluate native soils beneath the vertical extent of observed fill material (7.5 feet bgs).
- Lateral delineation samples were collected from borings B-7 and B-8 at depths of 12.5 feet bgs each, to delineate PCS encountered in B-1. A lateral delineation sample was also collected in B-9 at a depth of 8 feet bgs to delineate petroleum contamination encountered in B-4.

[3] DEQ (State of Oregon Department of Environmental Quality). (2010, March). *Guidance for Assessing and Remediating Vapor Intrusion in Buildings*.

Selected soil samples were analyzed for one or more of the following:

- Gasoline-range hydrocarbons by Northwest Method Total Petroleum Hydrocarbons, gasoline extended (NWTPH-Gx)
- Diesel-range hydrocarbons by Northwest Method Total Petroleum Hydrocarbons, diesel extended (NWTPH-Dx)
- VOCs by EPA Method 8260
- PAHs by EPA Method 8270
- Total Lead by EPA Method 6010
- Polychlorinated biphenyls (PCBs) by EPA Method 8082
- Resource Conservation Recovery Act (RCRA) 8 Metals

5 INVESTIGATION-DERIVED WASTES

Gloves, tubing, and other disposable field supplies were disposed of as solid waste. Soil cuttings, purged groundwater, and decontamination water were placed in a 55-gallon drum that was sealed, labeled, and placed in a secure location on site. The drums were picked up by ACT Enviro of Tacoma, Washington.

6 FINDINGS

6.1 Soil and Groundwater Field Observations

The surface of the Site was covered by an asphalt parking lot. During the Phase II ESA, the Site was being used as an active construction site and construction office trailers spanned nearly all of the southern property boundary. Stockpiled materials, equipment, scaffolding, and storage sheds were staged along most of the northern property boundary. The property had returned to its regular parking lot use during the additional assessment work.

The subsurface in the borings explored consisted of varying types of fill material extending to depths ranging from 7.5 to 11.5 feet bgs before transitioning to native soil that generally consisted of brown silt with clay and sand. Groundwater was not encountered in any of the boreholes. Boring logs are provided as Appendix F. Observable staining and petroleum odor were noted in soils from borings B-1, B-4, and B-6. PID readings were mostly nominal, with the exception of boring B-1 where headspace readings of soil cuttings from the 12-foot interval indicated a detection of 95 parts per million (ppm).

6.2 Soil Analytical Results

Soil sample analytical results are summarized in Tables 1 through 3. The following is a summary of the results:

- Diesel-range hydrocarbons were detected in borings B-1, B-4, and B-6 at concentrations ranging from 820 milligrams per kilogram (mg/kg) to 8,900 mg/kg.
- Heavy oil-range hydrocarbons were detected in borings B-4 and B-6 at concentrations of 28,000 mg/kg and 2,400 mg/kg, respectively.
- Gasoline-range hydrocarbons were detected in borings B-1 and B-4 at concentrations of 1,800 mg/kg and 55 mg/kg, respectively.
- Several petroleum-related VOCs were detected in boring B-1. Naphthalene was detected in borings B-1 and B-4 at concentrations of 0.34 mg/kg and 0.53 mg/kg, respectively.
- PAHs were detected in borings B-1 and B-4 at varying concentrations.

- Soil samples from borings B-4 and B-6 were selected for analysis for PCBs due to their respective heavy oil detections. PCBs were not detected above applicable reporting limits in either of the samples.
- Soil sample B4-8 indicated a total lead concentration of 220 mg/kg. The remaining soil samples collected during the investigation indicated detections of lead ranging from 3.65 mg/kg to 12.3 mg/kg. Soil samples collected from borings B-4 and B-6 were additionally subject to analysis for RCRA 8 metals due to their respective heavy oil detections. In addition to lead, the metals arsenic, barium, and chromium were detected in each sample at varying levels.

6.3 Soil Gas Analytical Results

Analytical results from the January 2022 Phase II ESA soil gas testing are provided in Table 4. Gasoline-range hydrocarbons and several VOCs, including 1,3-butadiene, acrolein, carbon disulfide, benzene, ethylbenzene, total xylenes, acetone, MEK, ethanol, hexachlorobutadiene, and TCE were detected in the sample.

Helium was used for leak detection. The VI Guidance allows up to 5% helium to be present in the sample, which is deemed to represent an insignificant contribution from ambient air. Helium was calculated at 3.85% in the sample as shown in Table 5, which indicates the contribution from ambient air is negligible and the results are within acceptable limits.

7 RISK-BASED EVALUATION

A conceptual site model (CSM) describes the known or suspected source of contamination, considers how the contaminants are likely to migrate (pathways), and identifies who is likely to be affected by the contaminants (receptors). For risk to be present, a source must be present, pathways must be complete, and receptors must be present. Analytical results were screened against DEQ's RBCs[4] to evaluate potential risk. The following sections describe the potentially complete exposure pathways and risk screening.

7.1 Source of Release

The source of the release is the historically removed USTs and fuel station components related to the former gas station.

7.2 Contaminants of Concern

Contaminants of concern for soil and groundwater include the following:

- Soil:
    - Gasoline-range hydrocarbons
    - Diesel- and heavy oil-range hydrocarbons
    - VOCs
    - PAHs
    - Metals including lead and arsenic
- Soil Gas:
    - Gasoline-range hydrocarbons
    - VOCs

[4] DEQ. (2003, September 22. Updated May 2018). *Risk-Based Decision Making for the Remediation of Contaminated Sites*.

7.3 Facility and Locality of the Facility

The facility is defined by the DEQ as an area in which hazardous substances or materials may have been deposited, stored, placed, or otherwise have come to be located, and a release has occurred or there is threat of a release. For the site, the facility is the historical location of the removed USTs, as well as the associated former pump island and product supply lines.

The locality of the facility (LOF) is defined by DEQ as the area where human or ecological receptors are reasonably likely to encounter facility-related hazardous substances. The area is determined by considering factors such as the physical and chemical characteristics of the contaminants, the physical characteristics that govern the migration of contaminants (i.e., soil characteristics and groundwater gradient), and human activities in the vicinity. The LOF typically defines the maximum migration extent for each medium, considering all these factors. The LOF for this property is bounded to the north by B-7, to the northeast by B-3, to the east by B-9, and to the south by B-2. The adjacent public right-of-way (ROW) and presence of underground utilities restricted drilling to the west of boring B-1. PBS noted that petroleum contamination was limited to the extent of the former USTs where fill gravel was present and is unlikely to have extended laterally into the adjacent fine-grained native silt. PBS utilized the eastern extent of PCS, measured to approximately 10 feet (distance between B-1 and B-8), to extrapolate the western lateral extent.

Because petroleum contamination was additionally encountered in borings B-4 and B-6, further to the east, the LOF is considered to be the site boundary and approximately 10 feet west of boring B-1.

7.4 Current and Likely Future Uses of Land and Groundwater

The site is currently operated as a parking lot for the adjacent Behavioral Health Resource Center. Future use of the site is not expected to change.

The Oregon Water Resources Department well query online database provides logs for water wells.[5] This database was reviewed by PBS on August 21, 2023, for water well logs located within 0.25 mile for Township 12S, Range 5W, Section 3. Geotechnical boreholes and abandoned wells were not considered beneficial uses for this review.

PBS identified 13 wells located within a 0.25-mile radius of the Site. A printout of water wells identified in Township 1N, Range 1E, Section 34 is included in Appendix G. None of the wells identified appear to be used for consumption and municipal water is known to be utilized throughout downtown Portland.

Groundwater was not encountered on site during either of the drilling investigations. Based on topography, the presumed direction of groundwater is toward the Willamette River, approximately 2,500 feet to the southeast.

7.5 Current and Future Receptors

Current receptors include visitors and staff of the Behavioral Health Resource Center. Future receptors include staff of the facility and facility occupants including future tenants occupying supportive housing, and construction and excavation workers if construction occurs in the LOF.

7.6 Potentially Complete Soil Exposure Pathways

The following soil pathways are potentially complete:

[5] http://apps.wrd.state.or.us/apps/gw/well_log/

- Soil ingestion, dermal contact, and inhalation for urban residential, occupational, and construction and excavation worker receptors
- Volatilization to outdoor air for urban residential and occupational receptors
- Vapor intrusion into buildings for urban residential and occupational receptors

The leaching to groundwater pathway is not complete based on the limited beneficial water use determination above, and because groundwater is not and will not be used at the site.

8 DATA EVALUATION AND EXPOSURE ASSESSMENT

For this site, analytical results were compared to DEQ RBCs for urban residential and occupational receptors, as well as construction and excavation workers for the soil ingestion, direct contact, and inhalation RBC. While PBS is aware that new vapor intrusion guidance is being finalized by DEQ, PBS requests that evaluation of the site be continued under former regulations as the evaluation and design of the assessment was completed under the guidance existing at the time. RBCs for the potentially complete exposure pathways are provided in Tables 1 through 4.

- TPH and PAH concentrations detected in soil samples collected from borings B-1 and B-4 were detected at concentrations exceeding DEQ RBCs for the soil ingestion, dermal contact, and inhalation pathway for urban residential, occupational, construction worker receptors.
- Gasoline-range hydrocarbons, naphthalene, and 1,2,4-trimethylbenzene were detected in soil sample B1-12 at concentrations exceeding vapor intrusion into buildings for urban residential receptors. The detected naphthalene concentration (54 mg/kg) additionally exceeds the volatilization to outdoor air RBC for urban residential receptors.
- Concentrations of VOCs and gasoline-range organics (GRO) in soil gas sample SV-01 were found to be below applicable RBCs for urban residential and occupational receptors. Additionally, concentrations of VOCs and GRO in GeoDesign's previous sub-slab soil gas assessment on the adjoining building did not exceed applicable RBCs.

9 CONCLUSIONS

PBS completed two drilling investigations to assess soil and subsurface vapor for contamination associated with the former gas station and hat cleaning business. Petroleum contamination including gasoline, diesel, and heavy oil-range hydrocarbons were detected in three of the six borings advanced at the Site. Because of the Site's well documented history as a gas station with regulated USTs, a release was subsequently reported to DEQ. Contaminants including TPH, VOCs, PAHs, and lead were detected in soil samples at depths of 8 and 12 feet bgs at levels exceeding DEQ RBCs protective of urban residential, occupational, and construction worker receptors. TPH detected in shallow soil at B-6 slightly exceeded RBCs for direct contact for urban residential receptors.

Despite this, unacceptable risk does not appear to be present at the Site given the current use. As the contamination was detected at depths ranging from 1 to 12 feet bgs and is beneath an asphalt parking lot, the soil ingestion, dermal contact, and inhalation pathway can be ruled out.

Gasoline-range hydrocarbons, naphthalene, and 1,2,4-trimethylbenzene were detected at the Site in exceedance of the vapor intrusion into buildings RBC protective of urban residential receptors. As the Site is currently a parking lot, there is no risk for vapor intrusion. The north-adjoining property at 333 SW Park Avenue was assessed for vapor intrusion in 2017 during a Phase II ESA completed by GeoDesign. Results of

three sub-slab vapor samples collected during the ESA did not indicate unacceptable risk. Copies of the figures and tables from the 2017 GeoDesign Phase II ESA are included in Appendix A.

The leaching to groundwater pathway is not complete based on the limited beneficial water use (public drinking water is utilized) and limited vertical extent of impacted soil.

A soil gas sample (SV-01) collected in the footprint of the former hat cleaning business detected GRO and several VOCs including TCE, a chemical commonly used in dry-cleaning businesses. These detections were found to be below applicable RBCs protective of human health, and therefore, no unacceptable soil gas risk appears to be related to the historical hat cleaning business.

9.1 Recommendations

As described above, unacceptable risk was not identified, and submittal of this report to DEQ and a request for a No Further Action (NFA) determination for LUST file 26-22-0048 is warranted.

10 LIMITATIONS

PBS has prepared this report for use by Multnomah County. This report is for the exclusive use of the client and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced in total or in part without the express written consent of the client and PBS.

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. Groundwater data collected from temporary borings is considered preliminary; detections may need confirmation by installation of permanent wells.

PBS Engineering and Environmental Inc.

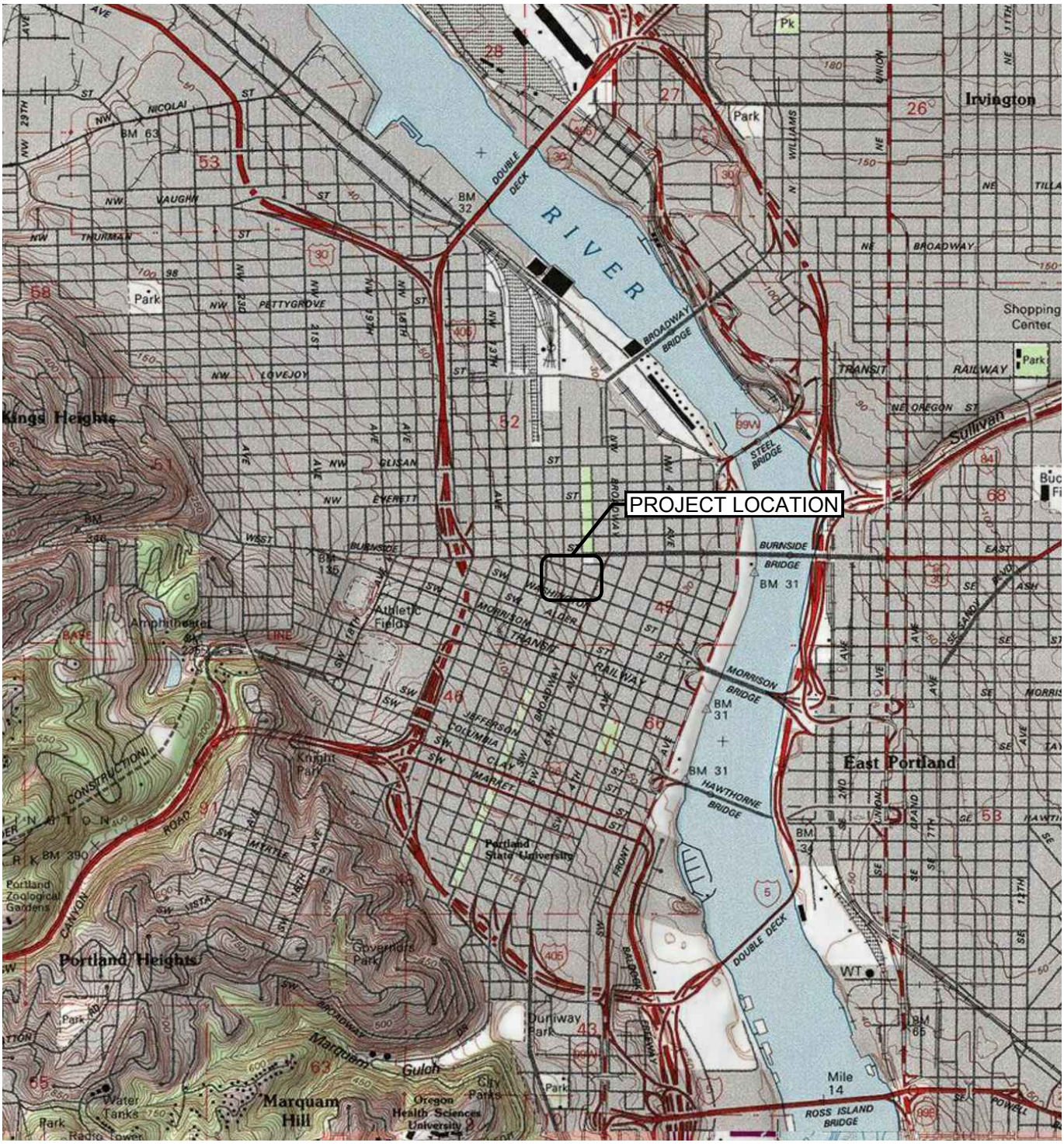
Digitally signed by Nick Thornton
Date: 2023.09.01 13:30:27 -07'00'

Nick Thornton Date
Project Manager

Digitally signed by Dennis Terzian
Date: 2023.09.01 13:34:40 -07'00'

Dennis Terzian, RG Date
Senior Geologist

Figures



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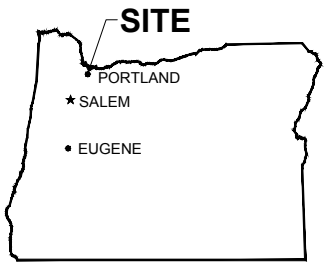


SCALE 1" = 2000'

0' 1,000' 2,000' 4,000'

PREPARED FOR: MULTNOMAH COUNTY

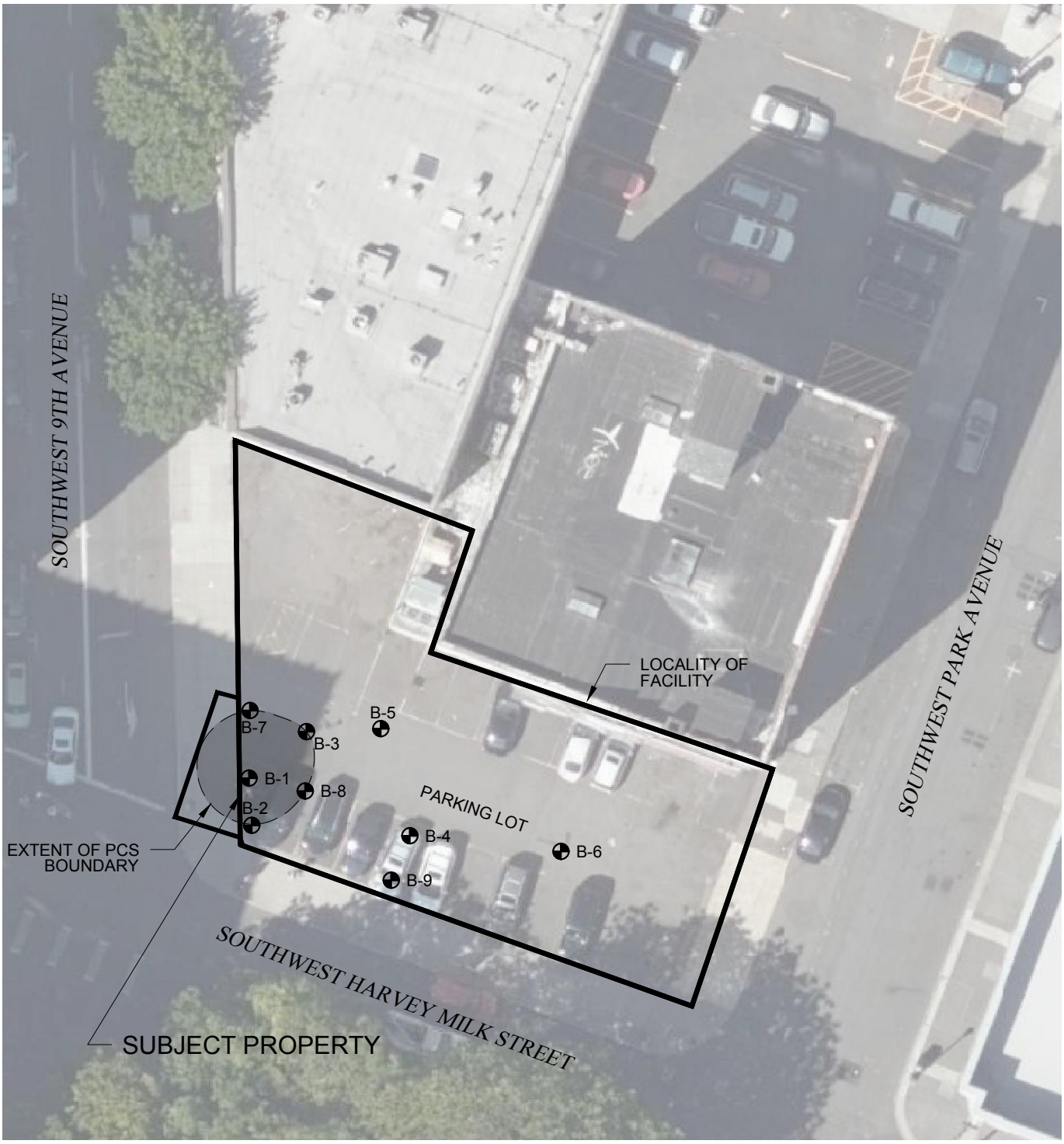
PBS

VICINITY MAP

801 SOUTHWEST HARVEY MILK AVENUE
PORTLAND, OREGON

SEPT 2023
15194.889

FIGURE
1



SOURCE: © 2021 MICROSOFT CORPORATION © 2021 MAXAR © CNES (2021) DISTRIBUTION AIRBUS DS

LEGEND

B-1 BORING NUMBER AND LOCATION

SCALE 1" = 30'

0' 15' 30' 60'

PREPARED FOR: MULTNOMAH COUNTY

PBS

SITE PLAN

801 SOUTHWEST HARVEY MILK AVENUE
PORTLAND, OREGON

SEPT 2023
15194.889

FIGURE
2

Tables

Table 1. Summary of Soil Analytical Results – TPH and VOCs

801 SW Harvey Milk Street

Portland, Oregon

Sample ID	Sampling Date	Depth Collected (feet bgs)	TPH			Volatile Organic Compounds (detections only)									
			Gasoline	Diesel	Heavy Oil	sec-Butylbenzene	tert-Butylbenzene	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	Naphthalene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes, Total
			mg/kg												
Phase II Environmental Site Assessment (January 2022)															
B1-12	1/20/2022	12.0	**1,800**	**2,500**	<250	1.00	0.240	0.880	0.610	0.870	**0.340**	2.60	**17.0**	5.70	3.51
B1-15	1/20/2022	15.0	<5.00	<50.0	<250	--	--	--	--	--	--	--	--	--	--
B2-12	1/20/2022	12.0	<5.00	<50.0	<250	--	--	--	--	--	--	--	--	--	--
B3-12	1/20/2022	12.0	<5.00	<50.0	<250	--	--	--	--	--	--	--	--	--	--
B4-8	1/20/2022	8.0	**55.0**	**8,900**	**28,000**	<0.050	<0.050	<0.050	<0.050	<0.050	**0.530**	<0.050	<0.050	<0.050	<0.150
B4-12	1/20/2022	12.0	<5.00	<50.0	<250	--	--	--	--	--	--	--	--	--	--
B5-2	1/20/2022	2.0	<5.00	<50.0	<250	--	--	--	--	--	--	--	--	--	--
B5-12	1/20/2022	12.0	<5.00	<50.0	<250	--	--	--	--	--	--	--	--	--	--
B6-2	1/20/2022	2.0	<5.00	820	**2,400**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.150
B6-10	1/20/2022	10.0	<5.00	<50.0	<250	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.150
Additional Assessment (March 2023)															
B7-12.5	3/2/2023	12.5	<8.45	<25.2	<50.5	--	--	--	--	--	--	--	--	--	--
B8-12.5	3/2/2023	12.5	<6.88	<23.3	<46.5	--	--	--	--	--	--	--	--	--	--
B9-8.0	3/2/2023	8.0	<8.70	<27.1	<54.3	--	--	--	--	--	--	--	--	--	--
Oregon RBC - Soil Ingestion, Dermal Contact, and Inhalation[1]	Urban Residential		2,500	**2,200**		NS	NS	110	7,000	NS	25	NS	220	1,600	2,900
	Occupational		20,000	**14,000**		NS	NS	150	57,000	NS	23	NS	2,000	12,000	25,000
	Construction Worker		9,700	**4,600**		NS	NS	1,700	27,000	NS	580	NS	2,000	3,500	20,000
	Excavation Worker		>MAX	>MAX		NS	NS	49,000	750,000	NS	16,000	NS	54,000	98,000	560,000
Oregon RBC - Volatilization to Outdoor Air[1]	Urban Residential		5,900	>MAX		NS	NS	85	>Csat	NS	15	NS	230	>Max	>Csat
	Occupational		69,000	>MAX		NS	NS	160	>Csat	NS	83	NS	980	>Max	>Csat
Oregon RBC - Vapor Intrusion into Buildings[1]	Urban Residential		**94**	>MAX		NS	NS	3.0	>Csat	NS	15	NS	**16**	>Max	160
	Occupational		>MAX	>MAX		NS	NS	17	>Csat	NS	83	NS	210	>Max	>Csat

Notes:

See laboratory report for full list of analytes and quality-control data.

Bold text, if present, indicates an exceedance of one or more of the cleanup levels.

[1]Oregon Risk-Based Decision-Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ Sept. 2003, Revised RBCs May 2018.

<: Not detected above the laboratory reporting limit

>Csat: Soil RBC exceeds the limit of three phase equilibrium partitioning.

>MAX: The RBC for this pathway is greater than 1,000,000 mg/kg. This substance is not deemed to pose a risk in this scenario.

--: analyte not tested

bgs: below ground surface

mg/kg: milligrams per kilogram

NA: not applicable

NS: not set for this analyte

TPH: total petroleum hydrocarbons

Table 2. Summary of Soil Analytical Results – PAHs
801 SW Harvey Milk Street
Portland, Oregon

			Polycyclic Aromatic Hydrocarbons (detections only)																	
Sample ID	**Sampling Date**	**Depth Collected (feet bgs)**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benz(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(g,h,i)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenzo(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-cd)pyrene**	**1-Methylnaphthalene**	**2-Methylnaphthalene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
			mg/kg																	
B1-12	1/20/2022	12.0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	79.0	150	**54.0**	0.800	<0.500
B1-15	1/20/2022	15.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B2-12	1/20/2022	12.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B3-12	1/20/2022	12.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4-8	1/20/2022	8.0	35.0	39.0	100	**260**	**250**	**270**	84.0	**98.0**	**280**	**28.0**	460	**51.0**	**110**	15.0	9.40	**14.0**	470	540
B4-12	1/20/2022	12.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B5-2	1/20/2022	2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B5-12	1/20/2022	12.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6-2	1/20/2022	2.0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
B6-10	1/20/2022	10.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oregon RBC - Soil Ingestion, Dermal Contact, and Inhalation[1]	Urban Residential		9,400	NS	47,000	**0.34**	**0.034**	**0.34**	NS	**3.4**	**34**	**0.034**	4,800	6,300	**0.34**	NS	NS	**25**	NS	3,600
	Occupational		70,000	NS	350,000	**2.9**	**0.29**	**2.9**	NS	**29**	290	**0.29**	30,000	47,000	**2.9**	NS	NS	**23**	NS	23,000
	Construction Worker		21,000	NS	110,000	**24**	**2.4**	**24**	NS	240	2,400	**2.4**	10,000	14,000	**24**	NS	NS	580	NS	7,500
	Excavation Worker		590,000	NS	>Max	660	**67**	670	NS	6,700	67,000	67	280,000	390,000	670	NS	NS	16,000	NS	210,000
Oregon RBC - Volatilization to Outdoor Air[1]	Urban Residential		>Max	NS	>Max	>Csat	NV	NV	NS	NV	NV	NV	NV	>Max	NV	NS	NS	**15**	NS	>Csat
	Occupational		>Max	NS	>Max	>Csat	NV	NV	NS	NV	NV	NV	NV	>Max	NV	NS	NS	83	NS	>Csat
Oregon RBC - Vapor Intrusion into Buildings[1]	Urban Residential		>Max	NS	>Max	>Csat	NV	NV	NS	NV	NV	NV	NV	>Max	NV	NS	NS	**15**	NS	>Csat
	Occupational		>Max	NS	>Max	>Csat	NV	NV	NS	NV	NV	NV	NV	>Max	NV	NS	NS	83	NS	>Csat

Notes:
See laboratory report for full list of analytes and quality-control data.
Bold text, if present, indicates an exceedance of one or more of the cleanup levels.
[1]Oregon Risk-Based Decision-Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ Sept. 2003, Revised RBCs May 2018.
<: Not detected above the laboratory reporting limit
>MAX: The RBC for this pathway is greater than 1,000,000 mg/kg. This substance is not deemed to pose a risk in this scenario.
*: Leaching-to-groundwater RBCs are not provided for inorganic chemicals. If this pathway is of concern, then site-specific leaching tests must be performed.
--: analyte not tested
bgs: below ground surface
mg/kg: milligrams per kilogram
NS: Not set for this analyte
NV: Compound not volatile so pathway is not valid
TPH: total petroleum hydrocarbons

Table 3. Summary of Soil Analytical Results – Metals and PCBs

801 SW Harvey Milk Street
Portland, Oregon

Sample ID	Sampling Date	Depth Collected (feet bgs)	Metals (detections only)				Total PCBs
			Arsenic	Barium	Chromium	Lead	
			mg/kg				
B1-12	1/20/2022	12.0	--	--	--	28.1	--
B1-15	1/20/2022	15.0	--	--	--	7.84	--
B2-12	1/20/2022	12.0	--	--	--	8.18	--
B3-12	1/20/2022	12.0	--	--	--	12.3	--
B4-8	1/20/2022	8.0	**2.37**	50.2	32.9	**220**	ND
B4-12	1/20/2022	12.0	--	--	--	6.38	--
B5-2	1/20/2022	2.0	--	--	--	4.64	--
B5-12	1/20/2022	12.0	--	--	--	10.9	--
B6-2	1/20/2022	2.0	**1.29**	80.2	13	3.65	ND
B6-10	1/20/2022	10.0	--	--	--	12	--
Oregon RBC - Soil Ingestion, Dermal Contact, and Inhalation[1]	Urban Residential		**1.0**	31,000	230,000	400	0.33
	Occupational		**1.9**	220,000	>MAX	800	0.59
	Construction Worker		15	69,000	530,000	800	4.9
	Excavation Worker		420	>MAX	>MAX	800	140
Oregon RBC - Volatilization to Outdoor Air[1]	Urban Residential		NV	NV	NV	NV	>Csat
	Occupational		NV	NV	NV	NV	>Csat
Oregon RBC - Vapor Intrusion into Buildings[1]	Urban Residential		NV	NV	NV	NV	>Csat
	Occupational		NV	NV	NV	NV	>Csat

Notes:

See laboratory report for full list of analytes and quality-control data.

Bold text, if present, indicates an exceedance of one or more of the cleanup levels.

<: Not detected above the laboratory reporting limit

>Csat: Soil RBC exceeds the limit of three phase equilibrium partitioning.

>MAX: The RBC for this pathway is greater than 1,000,000 mg/kg. This substance is not deemed to pose a risk in this scenario.

--: analyte not tested

bgs: below ground surface

mg/kg: milligrams per kilogram

Table 4. Soil Gas Analytical Results

801 SW Harvey Milk Street
Portland, Oregon

Sample ID	Sample Date	Sample Depth (feet bgs)	TPH	Volatile Organic Compounds (detections only)										
			Gasoline Range Organics	1,3-Butadiene	Acrolein	Carbon disulfide	Benzene	Ethylbenzene	Total Xylenes[1]	Acetone	2-Butanone (MEK)	Ethanol	Trichloroethene (TCE)	Hexachlorobutadiene
			µg/m^3											
SV-01	1/20/2022	5.0	3,900	0.87	3.9	120	3.0	9.1	42	350	50	190	1.4	1.5
Vapor Intrusion into Buildings[2]	Urban Residential		79,000	NS	NS	NS	170	530	21,000	NS	NS	NS	200	NS
	Occupational		1,700,000	NS	NS	NS	1,600	4,900	440,000	NS	NS	NS	2,900	NS

Notes:

Bold text, if present, indicates an exceedance of one or more of the cleanup levels.

[1]Total xylenes calculated as the sum of m,p-Xylene and o-xylene. If not detected, the sum of the method reporting limits were used.

[2]Oregon Risk-Based Decision-Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ Sept. 2003, Revised RBCs May 2018.

--: analyte not tested

<: analyte not detected above the laboratory reporting limit

bgs: below ground surface

µg/m^3: micrograms per cubic meter

NS: value not set

TPH: total petroleum compounds

Table 5. Summary of Leak Check Analysis

801 SW Harvey Milk Street

Portland, Oregon

Sample Point	Sample Date	[1]Helium Concentration (shroud)	Helium Concentration (sample)	Percentage of Helium in Sample	Leak Test Results
		ppmv	ppmv	%	pass/fail
SV-01	1/20/2022	650,000	<25,0000	3.85	pass

Notes:

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

<: less than the reported detection limit (RDL)

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

ppmv: parts per million volume

Appendix A

GeoDesign Limited Phase II ESA Memorandum

GEODESIGN INC

Memorandum

To:	Jonathan Ledesma	From:	Jeremy Zimber and Lon R. Yandell, R.G.
Company:	project^	Date:	August 23, 2017
Address:	1116 NW 17th Avenue Portland, OR 97209		
cc:	Tom Cody, project^ (via email only)		
GDI Project:	ProjectED-23-03		
RE:	Limited Phase II Environmental Site Assessment 333 SW Park Avenue Site Portland, Oregon		

INTRODUCTION AND BACKGROUND

GeoDesign, Inc. is pleased to present this technical memorandum that summarizes the limited Phase II ESA conducted at the 333 SW Park Avenue site located in Portland, Oregon (project site).

GeoDesign recently completed a Phase I ESA of the project site. The Phase I ESA identified that the project site was occupied by a printing facility from at least 1908 until sometime prior to 1955. In addition, from at least 1930 through approximately the late 1970s properties adjoining the project site were occupied by hat cleaning, printing, and automotive parking and fueling facilities. A limited Phase II ESA was recommended by GeoDesign to evaluate soil and soil vapor conditions at the project site based on the presence of these historical facilities. This memorandum summarizes the results of the subsurface explorations and associated soil and soil gas sampling of the project site.

The project site and vicinity are shown on Figure 1. The exploration and sub-slab soil gas sample locations are shown on Figures 2 and 3. Acronyms and abbreviations used herein are defined at the end of this document.

SCOPE OF SERVICES

Our specific scope of services included the following:

- Coordinated and managed the field investigation.
- Completed three roto-hammer borings through the floor slab of the project site structure.
- Collected sub-slab soil gas samples (SSV-1 through SSV-3) from each of the three roto-hammer borings using Teflon tubing and 1-liter summa sample canisters fitted with in-line filters (0.7 micron) and flow controllers (less than 200 milliliters a minute). A leak check system was utilized consisting of rags impregnated with isopropyl alcohol.

- Collected one soil sample from the upper 18 inches at each boring location using a hand auger following collection of the sub-slab soil gas samples.
- Submitted the sub-slab soil gas samples to ESC Lab Sciences of Mt. Juliet, Tennessee, for analysis of gasoline-range hydrocarbons and VOCs by EPA Method TO-15.
- Submitted one soil sample from each boring to ESC Lab Sciences for hydrocarbon identification screen by Method NWTPH-HCID
- Summarized the results of the limited Phase II ESA in this memorandum.

FIELD ACTIVITIES

On August 11, 2017 GeoDesign collected three sub-slab soil gas samples (SSV-1 through SSV-3) at the project site. GeoDesign then advanced three hand-augered borings (HA-1 through HA-3) in the same locations as the soil gas samples. The hand-augered borings were completed to depths ranging between 2.0 and 2.5 feet BGS. The exploration and sub-slab soil gas sample locations are shown on Figures 2 and 3.

Subsurface soil encountered during our explorations primarily consists of silt and clay with trace sand to the maximum depths explored. Groundwater was not encountered in the borings. Soil samples were collected from the three borings and screened in the field using visual, water sheen screening, and headspace vapor screening using a hand-held PID. Field evidence of petroleum hydrocarbon contamination was not observed in any of the soil samples collected from borings HA-1 through HA-3. The exploration logs are presented in Attachment A.

To obtain sub-slab soil gas samples, a ¼-inch-diameter hole was drilled through the concrete slab at the SSV-1 through SSV-3 sample locations. Teflon tubing was inserted and the hole was sealed with hydrated bentonite. After purging 2 to 3 volumes of air from the sampling train using a PID, the samples were collected in a laboratory-supplied, 1-liter summa canister equipped with in-line filters (0.7 micron) and flow controllers (less than 200 milliliters per minute). The initial and final vacuum pressures of each summa canister were measured and recorded on the laboratory summa canister labels.

CHEMICAL ANALYTICAL PROGRAM

The soil and sub-slab soil gas samples were transported under chain-of-custody procedures to ESC Lab Sciences of Mt. Juliet, Tennessee. Soil samples were submitted for hydrocarbon identification screen by Method NWTPH-HCID. Sub-slab soil gas samples were analyzed for gasoline-range hydrocarbons and VOCs by EPA Method TO-15.

Chemical analytical results are presented in Tables 1 and 2 and are discussed below. The analytical laboratory report and chain-of-custody documentation are presented in Attachment B.

REGULATORY SCREENING LEVELS

The sub-slab soil gas chemical analytical results were compared to applicable 2015 DEQ RBCs for the detected compounds. Comparisons of the chemical analytical results to applicable regulatory screening levels are presented in Table 2 and are discussed in the following sections.

SOIL CHEMICAL ANALYTICAL RESULTS

HYDROCARBON IDENTIFICATION SCREEN

All three soil samples [HA-1(1.0-2.0), HA-2(1.0-2.0), and HA-3(1.0-2.0)] were submitted for hydrocarbon identification screen by Method NWTPH-HCID. Gasoline-, diesel-, and residual-range organics were not qualitatively detected at concentrations greater than the analytical laboratory RDLs in any of the soil samples analyzed.

SUB-SLAB SOIL GAS CHEMICAL ANALYTICAL RESULTS

Sub-slab soil gas samples SSV-1 through SSV-3 were analyzed for gasoline-range hydrocarbons [TPH (GS/MS) Low Fraction] and VOCs by EPA Method TO-15. Gasoline-range hydrocarbons and VOCs were either not detected at concentrations greater than analytical laboratory RDLs or were detected at concentrations less than the applicable DEQ RBCs in the soil gas samples analyzed.

CONCLUSIONS AND RECOMMENDATIONS

GeoDesign performed environmental services in general accordance with the proposal to project^ dated August 10, 2017 for the project site located at 333 SW Park Avenue in Portland, Oregon. The limited Phase II ESA was conducted to evaluate if former printing operations at the project site or historical operations on properties adjoin the project site have impacted subsurface soil and sub-slab soil gas and to evaluate if there is a related vapor intrusion risk. The results of the limited Phase II ESA identified the following:

- Gasoline-, diesel-, and residual-range organics were not qualitatively detected at concentrations greater than the analytical laboratory RDLs in any of the soil samples analyzed.
- VOCs and TPH Low Fraction were detected in the sub-slab soil gas samples collected during this investigation; however, the concentrations detected were less than the DEQ *Vapor Intrusion into Buildings* RBCs for the occupational receptor. It is our professional opinion that sub-slab soil gas concentrations at the project site do not pose an immediate threat to public health, safety, or the environment at this time.

Based on the results of our limited Phase II ESA, the historical operations on and adjoining the project site do not appear to have impacted soil or soil gas at concentrations above DEQ RBCs in the areas investigated. Therefore, further investigation does not appear warranted at this time.

LIMITATIONS

This memorandum has been prepared for use by project^. Our interpretations of subsurface conditions are based on data from select samples collected from limited project site areas. The results of the analyses only indicate the presence or absence of those chemical constituents analyzed in those discrete sample locations. Analytical data from the laboratory samples should only be considered as indicators of project site conditions and not a guarantee of the absence of subsurface impact in areas not sampled.

The conclusions presented in this memorandum are based on our observations made during field investigations and laboratory analytical data. The findings of this assessment should be considered as a professional opinion based on our evaluation of the data collected.

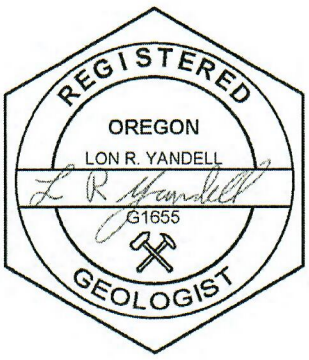
This memorandum is not intended for use by others, and the information contained herein is not applicable to other sites. Reliance on this memorandum by other parties must be approved by GeoDesign, Inc. in accordance with our standard contractual process for third party reliance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted environmental science practices for due diligence environmental services in this area at the time this memorandum was prepared. No warranty or other conditions, express or implied, should be understood.

♦ ♦ ♦

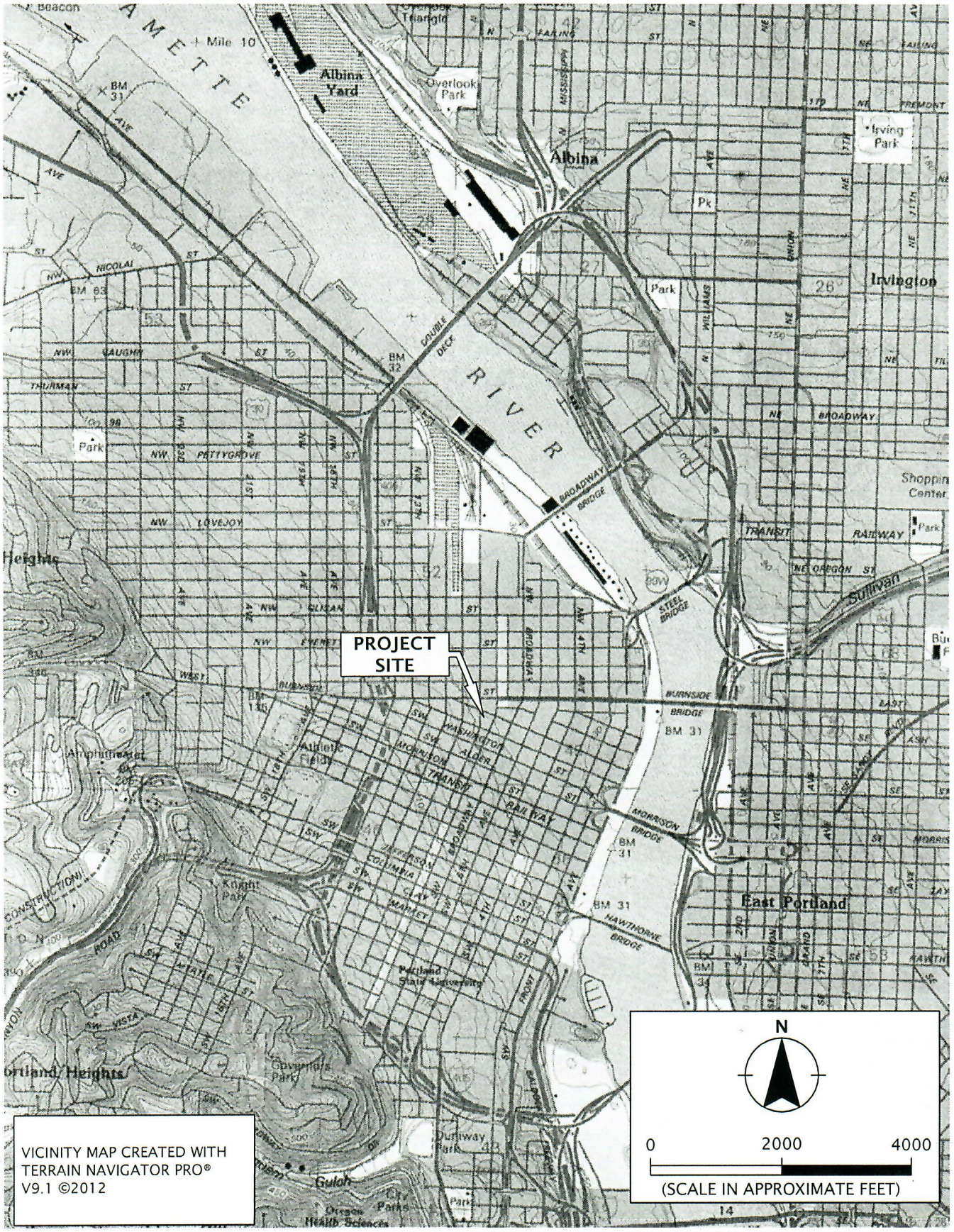
We appreciate the opportunity to be of continued service to you. Please call if you have questions concerning this memorandum.

JMZ:LRY:kt
Attachments
One copy submitted (via email only)
Document ID: ProjectED-23-03-082317-envm.docx



Expires 06/01/2018

FIGURES



VICINITY MAP CREATED WITH TERRAIN NAVIGATOR PRO® V9.1 ©2012

GEODESIGN INC
9450 SW Commerce Circle - Suite 300
Wilsonville OR 97070
503.968.8787 www.geodesigninc.com

PROJECTED-23-03	**VICINITY MAP**	
AUGUST 2017	333 SW PARK AVENUE SITE PORTLAND, OR	**FIGURE 1**

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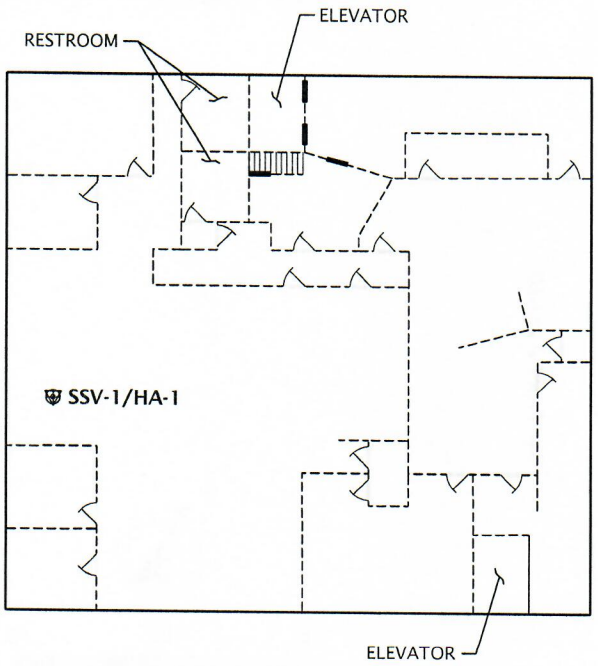
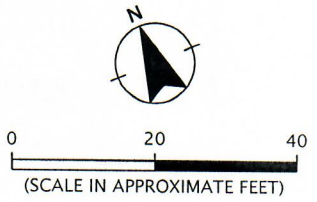


SW PARK AVENUE

LEGEND:

HA-1 ⊕	HAND-AUGERED BORING
SSV-1 ▽	SUB-SLAB SOIL GAS SAMPLE



SITE PLAN BASED ON OBSERVATIONS AND FIELD MEASUREMENTS BY GEODESIGN STAFF

GEODESIGN INC 9450 SW Commerce Circle - Suite 300 Wilsonville OR 97070 503.968.8787 www.geodesigninc.com	PROJECTED-23-03	SITE PLAN - FIRST FLOOR	
	AUGUST 2017	333 SW PARK AVENUE SITE PORTLAND, OR	FIGURE 2

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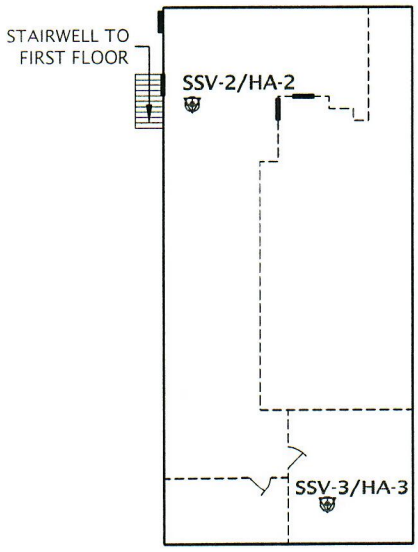
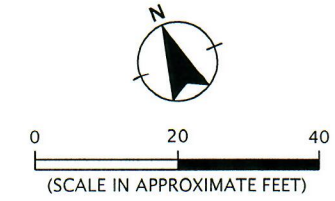


SW PARK AVENUE

LEGEND:

HA-2 ⊕	HAND-AUGERED BORING
SSV-2 ▽	SUB-SLAB SOIL GAS SAMPLE



SITE PLAN BASED ON OBSERVATIONS AND FIELD MEASUREMENTS BY GEODESIGN STAFF

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503.968.8787 www.geodesigninc.com

PROJECTED-23-03	**SITE PLAN - BASEMENT**	
AUGUST 2017	333 SW PARK AVENUE SITE PORTLAND, OR	**FIGURE 3**

TABLES

TABLE 1
Summary of Soil Sample Chemical Analytical Results[1]
Petroleum Hydrocarbons
333 SW Park Avenue Site
Portland, Oregon

Sample I.D. (depth in feet BGS)	Sample Date	Hydrocarbon Identification by Method NWTPH-HCID (mg/kg)					
		Gasoline-Range		Diesel-Range		Residual-Range	
HA-1(1.0-2.0)	08/11/17	5.00	U	5.00	U	12.5	U
HA-2(1.0-2.0)	08/11/17	5.54	U	5.54	U	13.8	U
HA-3(1.0-2.0)	08/11/17	5.65	U	5.65	U	14.1	U

Notes:
1. Chemical analyses performed by ESC Lab Sciences of Mt. Juliet, Tennessee.
U: not detected at concentrations greater than the laboratory RDL (shown)

TABLE 2
Summary of Vapor Sample Chemical Analytical Results[1]
VOCs
333 SW Park Avenue Site
Portland, Oregon

Sample I.D.	Sample Date	Sample Depth (feet BGS)	TPH (GC/MS) Low Fraction	VOCs[2] by EPA Method TO-15 (µg/m³)									
				Acetone	Benzene	2-Butanone (MEK)	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Dichlorodifluoromethane	Ethanol	4-Ethyltoluene	Heptane
SSV-1	08/11/17	0.5	**819**	**58.2**	**3.35**	**21.9**	**2.36**	**4.16**	1.95 U	**2.07**	**40.7**	**2.38**	**5.81**
SSV-2	08/11/17	0.5	413 U	**20.4**	**5.21**	7.37 U	1.24 U	2.52 U	**4.09**	1.98 U	**12.4**	1.96 U	**1.68**
SSV-3	08/11/17	0.5	413 U	**83.1**	1.28 U	**13.0**	**4.68**	2.52 U	**3.46**	1.98 U	**43.9**	1.96 U	1.64 U
DEQ Generic RBCs[3]													
Vapor Intrusion into Buildings													
Occupational			1,700,000	NE	1,600	NE	NE	2,000	530	NE	NE	NE	NE

TABLE 2
Summary of Vapor Sample Chemical Analytical Results[1]
VOCs
333 SW Park Avenue Site
Portland, Oregon

Sample I.D.	Sample Date	Sample Depth (feet BGS)	VOCs[2] by EPA Method TO-15 (µg/m³)									
			n-Hexane	2-Propanol	Propene	Tetrachloroethene (PCE)	Toluene	1,1,1-Trichloroethane	Trichloroethene (TCE)	1,2,4-TMB	m&p-Xylene	o-Xylene
SSV-1	08/11/17	0.5	**9.36**	6.15 U	**16.9**	**17.8**	**4.90**	**16.8**	2.14 U	**5.65**	**3.89**	1.73 U
SSV-2	08/11/17	0.5	**1.50**	6.15 U	**10.3**	2.72 U	**4.77**	2.18 U	2.14 U	1.96 U	3.47 U	1.73 U
SSV-3	08/11/17	0.5	1.41 U	**16.3**	1.38 U	**4.29**	1.51 U	2.18 U	**2.23**	1.96 U	3.47 U	1.73 U
DEQ Generic RBCs[3]												
Vapor Intrusion into Buildings												
Occupational			NE	NE	NE	47,000	21,900,000	21,900,000	2,900	31,000	440,000	

Notes:
1. Chemical analyses performed by ESC Lab Sciences of Mt. Juliet, Tennessee.
2. Only VOCs detected during this investigation are listed. For a complete listing of VOCs, refer to the laboratory report in Attachment B.
3. DEQ Generic RBCs dated November 1, 2015
U: not detected at concentrations greater than the laboratory RDL (shown)
Bolding indicates analyte detection.

Appendix B

Geophysical Survey Report

July 2022 Pacific Geophysics

PACIFIC GEOPHYSICS

LETTER REPORT

PROJECT #: 220105
SURVEY DATE: 1/19/22

Dennis Terzian
PBS Environmental

UST and UST Excavation Survey
801 SW Harvey Milk Street
Portland, Oregon

A geophysical survey was conducted at the location shown above, for PBS Environmental. A gas station has operated at this location in the past. Several underground storage tanks (USTs) have reportedly been removed from the southwest corner of the site. The scope of the survey was to locate the UST excavation, as well as possible unknown tanks or other excavations. An additional scope was to clear several proposed borehole locations of buried obstructions and piping across the survey area. No surface evidence of USTs, like fill ports or vent pipes, was seen at the site. The survey area is shown in Figure 1.

A Geometrics G858 cesium-vapor magnetometer was used to collect magnetic data across the western half of the asphalt property and the concrete sidewalks. A grid was set across the survey area with tapes and a measuring wheel. 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.

The site is an active construction site with equipment, stocked items, temporary fences, and office trailers covering some of the survey area. Several metallic surface features created magnetic interference, including the building, the trailers, buckets with construction material, tool boxes, stored items, signposts, a hydrant, a yard light, a power-supply box, and the chain-link fences. 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.

An Aqua-Tronics EMA6 Tracer and a Schonstedt magnetic gradiometer were used to locate and investigate any anomalies detected by the magnetometer. These instruments can pinpoint the peaks and troughs of the anomalies and, in many cases, determine if an object is linear (pipe or utility) or three-dimensional (UST). The results of the investigation with interpretation of anomalies are described below.

- Magnetic anomaly marked A is caused by the fence and other surface objects, including a metal plate on the ground.
- Anomaly B appears to be caused by a metal box containing construction debris.
- Anomaly marked C is interpreted to be caused by a vault and the steel base of the temporary fence. The function of the vault is unknown, but it contains metal and created significant interference.
- Anomalies D in the sidewalk are caused by the fence, parked cars, and the trailers. A SIR-4000 ground-penetrating radar (GPR) control unit connected to a 400-MHz antenna was used to collect profiles along the sidewalk; no suspicious objects were detected.

GPR was used to collect profiles across the survey area, including the sidewalks, to detect possible disturbed-soil zones created from the removal of the former station's tanks. Such a zone was detected in the southwest corner of the site between the trailers and the west curb. It is shown in Figure 2 and is interpreted to be the former tank nest. A subtle soil disturbance containing piping was detected to the east of this zone in the area just north of the trailer's steps. It is shown in Figure 2. No other such zones were detected.

The Tracer, RD receiver, and GPR were used to clear several proposed borehole locations.

Nikos Tzetos of Pacific Geophysics conducted the survey for Mr. Dennis Terzian of PBS on January 19, 2022. Mr. Nick Thornton of PBS was the PBS field representative. This letter report was written by Nikos Tzetos and emailed to Messrs. Terzian and Thornton on January 31, 2022.

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.

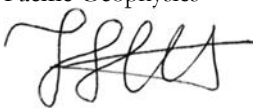
Under reasonable conditions, geophysical surveys are good at detecting changes in the subsurface caused by fabricated objects or changes in subsurface conditions, but they are poor at actually identifying those objects or subsurface conditions.

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

January 31, 2022



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 fabricated 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-4000 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.

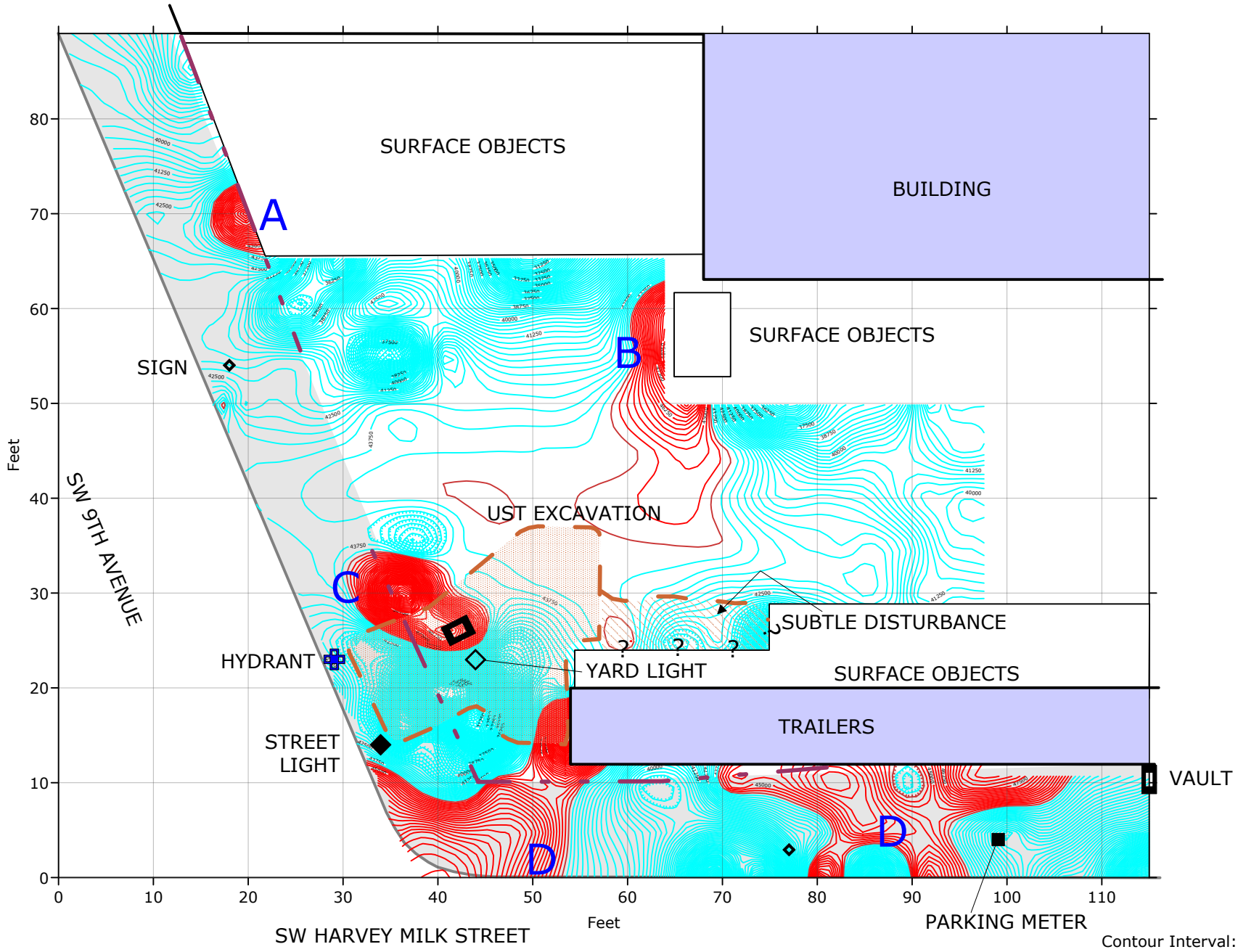
The transmitter may be used to directly apply a small electrical current to exposed, electrically conductive pipes and utilities. The RD receiver is then able to "trace" the underground portion of the pipe or utility, under some conditions for several hundred feet. The transmitter can also induce an 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	Survey Location and Area	
	Project: 220105	UST and UST Excavation Survey 801 SW Harvey Milk Street Portland, Oregon
	Drawn by : NT	Prepared for: PBS Environmental
		Base Photo from Google Earth



Contour Interval: 250 nT

PACIFIC GEOPHYSICS

FIGURE	Magnetic Contour Map	
2	Project: 220105	UST and UST Excavation Survey 801 SW Harvey Milk Street Portland, Oregon
	Drawn by : NT	Prepared for: PBS Environmental
		Survey Dates: January 19, 2022

Appendix C
Photo Documentation

Photo 1. Looking northeast at the Site from the corner of SW Stark (Harvey Milk) Avenue and SW 9th Avenue. The Texaco gas station and "pigeon-hole" parking can be seen in the photo. Photo taken in 1955.

Photo 2. The same view of the Site from January 2022. The Site is being used as a staging area and construction site for a renovation project in the adjacent 333 SW Park Avenue building.

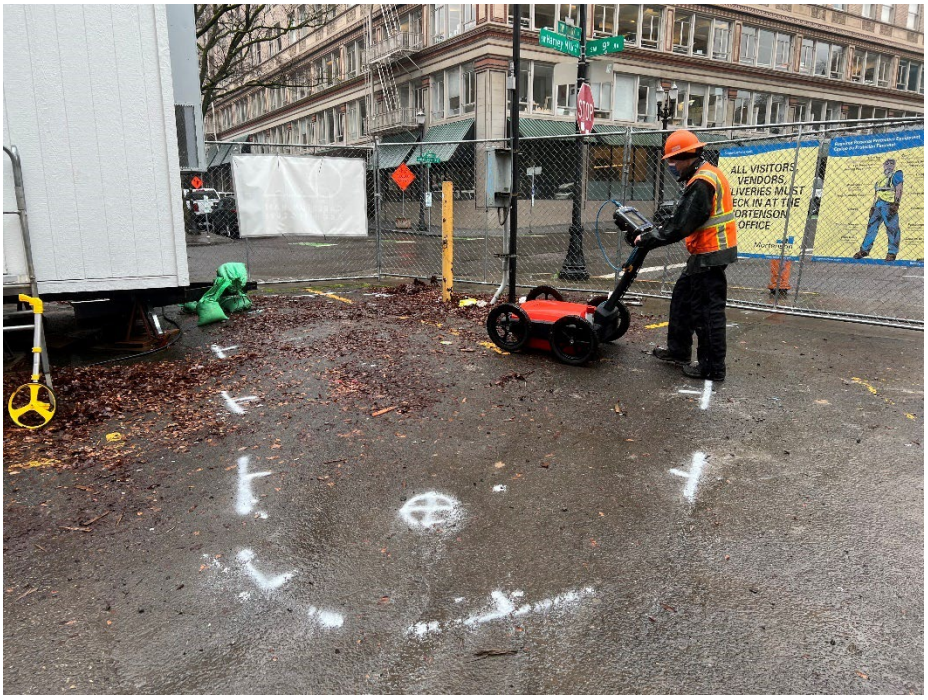


Photo 3. A large excavation consistent with a former tank removal was detected at the southwest corner of the site during the January 2022 Phase II Environmental Site Assessment (ESA).

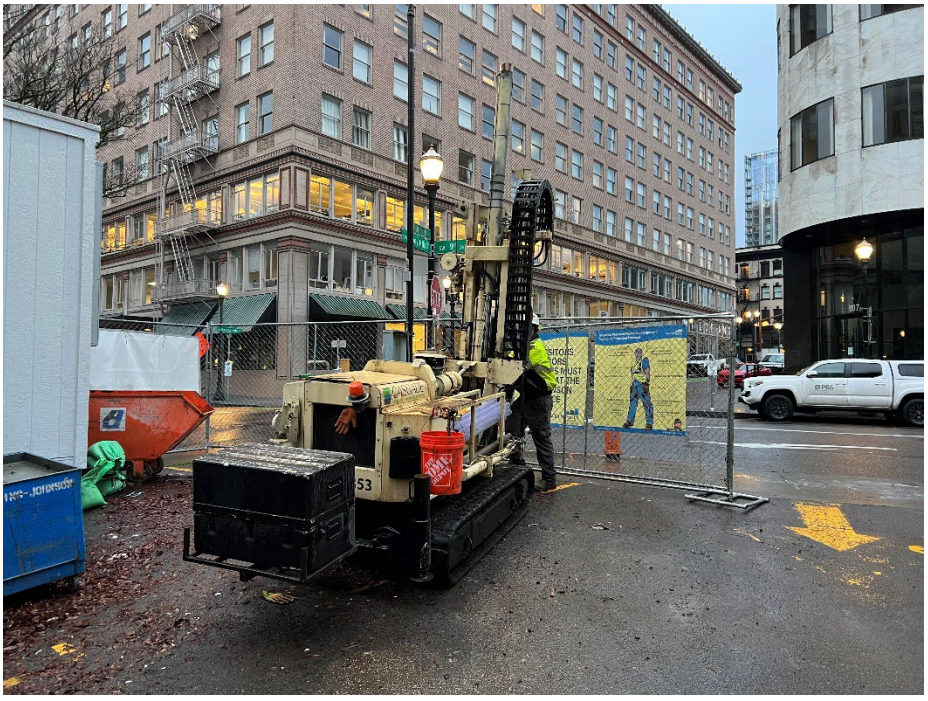


Photo 4. Cascade Drilling completed boring B-1 within the former tank excavation.

Photo 5. Pea gravel backfill material was observed in borings B-1 and B-3, advanced through the large excavation that was detected during the geophysical survey.

Photo 6. A soil gas sample was collected from boring B-6 using a post-run tubing (PRT) sampler. Helium was used as a tracer gas for leak detection.

Photo 7. A truck-mounted hollow stem auger with a split-spoon sampler was used to advance borings B-7 through B-9.

Photo 8. Boring B-8 being completed to the east of B-1.

Appendix D

Relevant Historical Site Documents

City of Portland, Oregon
BUREAU OF FIRE—FIRE PREVENTION DIVISION

GASOLINE AND MOTOR FUEL TANK AND PUMP APPLICATION

Permit No. 4183

Date 4/25/52 19

Fee of $2.50 for each pump and each tank must accompany application. Make check payable to [redacted], City Treasurer.

Address 801 8th SW Stark St

Installed for The Texas Co Occupancy Parklot

Applicant W R Kane Phone Be 0326

TANK

Capacity 3500 Gal.

U. S. Gauge

LOCATION

Street Private Property ✓

New ✓ Replacement

Total No. Tanks on Premises 2

Total Gallons on Premises 7000

PUMP

Type Comp

Model

LOCATION

Make Wayne

In Bldg. Tobkin Or Island ✓

Replacement Addition ✓

Total No. Pumps on Premises 2

TANK-PIPING

B 63929

Inspected by Ref.

Date 6/3/52

FIRE INSPECTOR'S REPORT

PUMP

A 385-705

Inspected by

Date

Installation to be in conformance with Ordinance No. 78461 and under supervision of the Fire Marshal. Note: Before any portion of street is used, owner of the property must apply to the City Engineer for permit to use street. Notify Fire Marshal for inspection before tank or pipes are covered.

2826

Date 4/25/52 19

City of Portland, Oregon
BUREAU OF FIRE—FIRE PREVENTION DIVISION

GASOLINE AND MOTOR FUEL TANK AND PUMP APPLICATION

Permit No. 41184
Fee of $2.50 for each pump and each tank must accompany application. Make check payable to [redacted], City Treasurer.

Address 801 84 NW Stark St
Installed for The Texas Co Occupancy Park lot
Applicant W R Karn Phone Be 0326

TANK

Capacity 3500 Gal.
U. S. Gauge

LOCATION
Street Private Property ✓
New ✓ Replacement
Total No. Tanks on Premises 2
Total Gallons on Premises 7000

PUMP

Type Comp
Model

LOCATION
Make [illegible]
In Bldg. On Island ✓
Replacement Addition ✓
Total No. Pumps on Premises 2

TANK-PIPING

O.K. 6-3930

Inspected by [signature] Date 6/3/52

FIRE INSPECTOR'S REPORT

PUMP

A-440033

Inspected by Date

Installation to be in conformance with Ordinance No. 78461 and under supervision of the Fire Marshal. Note: Before any portion of street is used, owner of the property must apply to the City Engineer for permit to use street. Notify Fire Marshal for inspection before tank or pipes are covered.

2826

Permit No. 881621

Date 3-10 1989

City of Portland, Oregon
BUREAU OF FIRE—FIRE PREVENTION DIVISION

GASOLINE AND MOTOR FUEL TANK AND PUMP APPLICATION

Fee must accompany each application. Make check payable to City Treasurer

Address 801 8th SW STARK ST

Installed for CITY CENTER PARKING Occupancy

Applicant KRIG Phone 244-5346

TANK

Capacity

_____ Gal.

Material (Steel, Fiberglas)

LOCATION

Street _____ Private Property _____

New _____ Replacement _____

Total No. Tanks on Premises Including This Permit _____

Total Gallons on Premises Including This Permit _____

PUMP

250-6065

Type Vaue Beeper Make

LOCATION

Sub. _____ In Bldg. _____ On Island _____

Model

In-Dispenser Replacement _____ Addition _____

Model Total No. Pumps on Premises _____

TANK-PIPING

19D(3) ABANDON

Inspected By _____ Date _____

FIRE INSPECTOR'S REPORT

PUMP

Inspected By _____ Date _____

Installation to be in conformance with Orindance No. 130672 and under supervision of the Fire Marshal. NOTE: Before any portion of street area is used, owner of property must apply to City Engineer for permit to use street. Notify Fire Marshal for inspection before tank or pipes are covered.

P.F.B. 300.148

248-4363.

TANK ABANDONMENT

Exact Location of Tanks on Property:

3 TANKS

Method of Abandonment:

_____ Temporarily out of service.

_____ Abandoned in place.

__✓__ Removal of tank.

In accordance with usual requirements:

__✓__ Yes _____ No

If "No", explain: _____

1-7-91
Date

Inspector

Booms Picture

801 S.W. STARK

326654 26-5

Sidewalk

Driveway

Property Line

Dry pack under sidewalk

Sidewalk Level

R.R.M.

E.F.

Pumps

Asphalt Paving

Driveway

Property Line

Driveway

Sidewalk

Property Line

Property Line

Sump

DETAIL-A

SECTION B-B

NOTES:

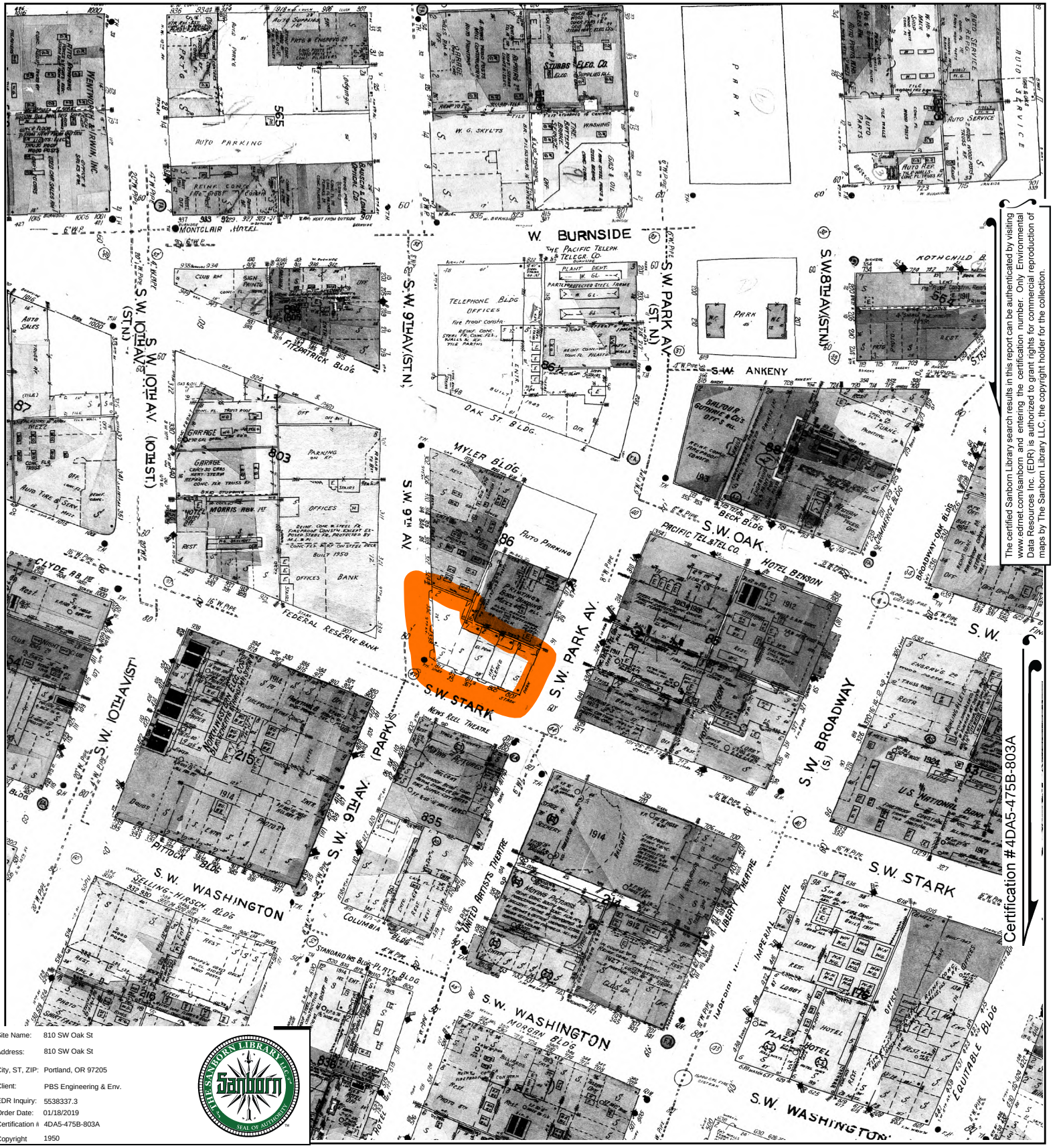
All footings to extend to firm bearing soil.

(10.2) - Existing grades; -F.G.- Finished grades

For Detail-A; Anchor Bolts - Rails & addl. dimensions & information see Drawing No 41-5-117, of the PIERCE CO. - Portland, ore.

Bearing Value of soil 3000 #/ft² ; fc = 2500 psi ; fs = 18000 psi

Foundation Plan for Pigeon Hole Parking Installation for O.E. Davis	
Location: S. half of Lot 6, except the E. 5 ft. & all of Lot 7 in Block 69, City of Portland - Oregon	
Date: 3-'62	Scale: 1/4" = 1'-0" Detail: W.K.M.
Checked: W.K.M.	Apprvd: [illegible] Drg. No. 1 X-1



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Site Name:	810 SW Oak St
Address:	810 SW Oak St
City, ST, ZIP:	Portland, OR 97205
Client:	PBS Engineering & Env.
EDR Inquiry:	5538337.3
Order Date:	01/18/2019
Certification #	4DA5-475B-803A
Copyright	1950

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

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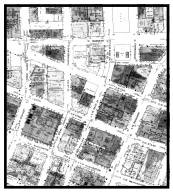

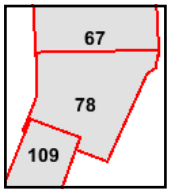

Volume 1, Sheet 78
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Volume 2, Sheet 109

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Appendix E

Standard Operating Procedures

Drilling and Soil Sampling Procedures
Sub-Slab and Soil Gas Sampling

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. Locations should be located at a minimum of 3 feet inside foundation edges or exterior walls to obtain the most representative results.
- 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. Locations should be located at a minimum of 3 feet inside foundation edges or exterior walls to obtain the most representative results.
- 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	• Teflon tape (if seal leaks are sustained).

supplies	• 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. Locations should be located at a minimum of 3 feet inside foundation edges or exterior walls to obtain the most representative results.
- 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. Locations should be located at a minimum of 3 feet inside foundation edges or exterior walls to obtain the most representative results.
- 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

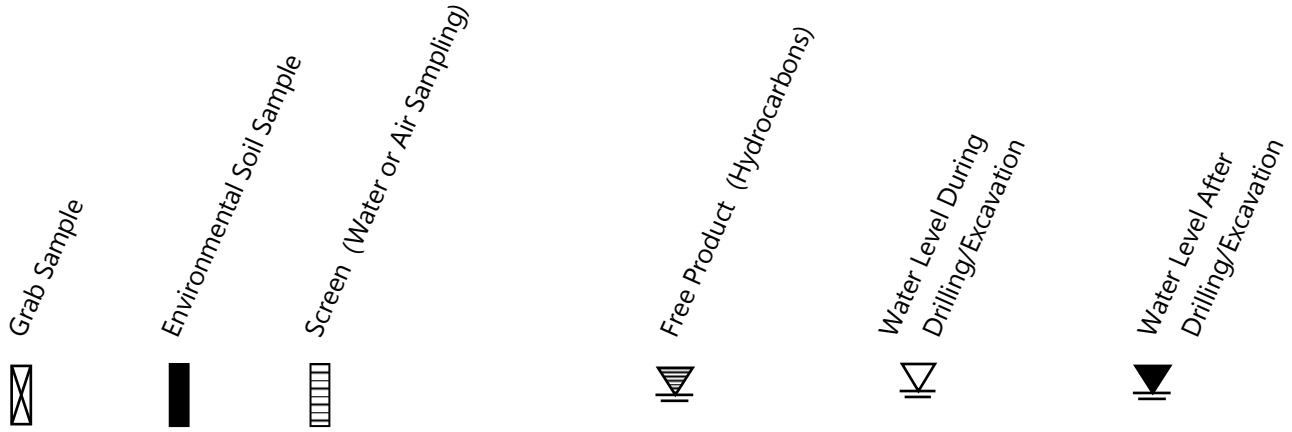
Regulatory guidance in Oregon and Washington allow up to 5 percent helium within a sample. To confirm that helium detections meet this regulatory requirement, the following will occur:

- 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 F
Boring Logs

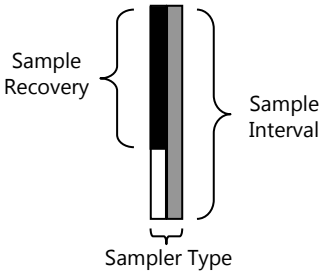
Key To Test Pit and Boring Log Symbols

SAMPLING DESCRIPTIONS

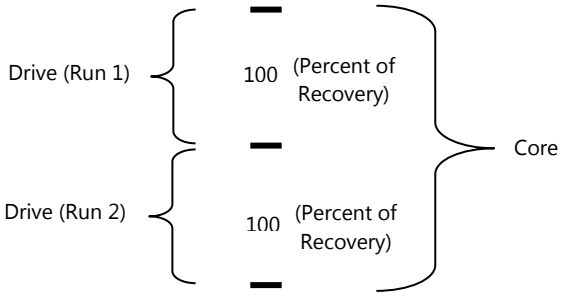


LOG GRAPHICS

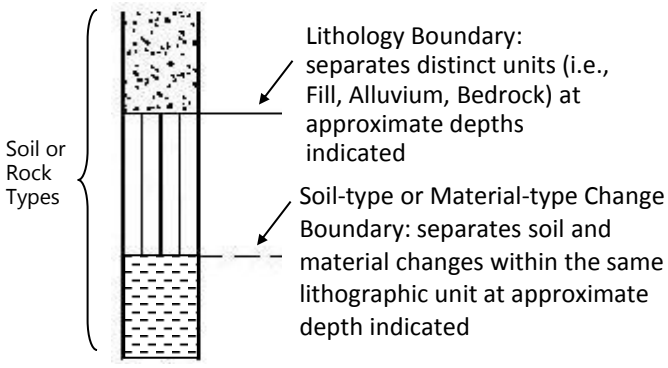
Sampling Symbols



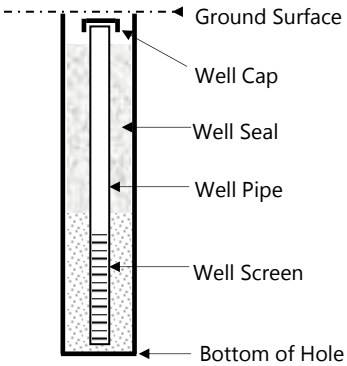
Direct Push, Sonic, Vibracore Drilling



Soil and Rock Divisions



Well Detail



ENVIRONMENTAL TESTING EXPLANATIONS

ATD	At Time of Drilling	PPM	Parts PerMillion
BGS	Below Ground Surface	ND	Not Detected
MSL	Mean Sea Level	NS	No Sheen
MW	Monitoring Well (Water Sampling)	SS	Slight Sheen
OD	Outside Diameter	MS	Moderate Sheen
PID	Photoionization Detector Headspace Analysis	HS	High Sheen

Observations presented on the logs are based on limited field data and are not intended to be used for site engineering or construction decision purposes.

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

BORING B-1

PBS PROJECT NUMBER:
15194.889

BORING B-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		Poorly graded GRAVEL (GP); fine, rounded to subrounded gravel; damp (pea gravel)						Poor recovery to 11 feet bgs
		FILL					5	
2.0								
4.0								
6.0							5	
8.0								
10.0		Brown SILT (ML) with sand; low plasticity; fine sand; damp		95	B1-12		100	Petroleum contamination observed from 11 to 13 feet bgs
12.0								
14.0				0.3	B1-15			
		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Direct Push
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: N. Thornton
COMPLETED: 1/20/22

BORING LOG-ENV CORE 15194.889 B1-6 20220124.GPJ DATATMPL.GDT PRINT DATE: 2/7/22 RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

BORING B-2

PBS PROJECT NUMBER:
15194.889

BORING B-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		Brown, gravelly SILT (ML) with sand; non-plastic; coarse sand; fine to coarse, subangular to angular gravel; damp						
		FILL		0.1			60	
2.0								
4.0								
6.0				0.1			50	
8.0								
10.0				0.1	B2-12		75	
12.0		Brown SILT (ML); low plasticity; damp						
14.0		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Direct Push
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: N. Thornton
COMPLETED: 1/20/22

BORING LOG-ENV CORE 15194.889 B1-6 20220124.GPJ DATATMPL.GDT PRINT DATE: 2/7/22 RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

BORING B-3

PBS PROJECT NUMBER:
15194.889

BORING B-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		Poorly graded GRAVEL (GP); fine, rounded to subrounded gravel; damp (pea gravel)						
		FILL					60	
2.0								
4.0								
6.0				0.1				
8.0							100	
10.0		Gray-brown SILT (ML) with some clay; low plasticity; damp						
12.0				0.2	B3-12		100	
14.0				0.1				
16.0		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
18.0								
20.0								

BORING METHOD: Direct Push
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: N. Thornton
COMPLETED: 1/20/22

BORING LOG-ENV CORE 15194.889 B1-6 20220124.GPJ DATATMPL.GDT PRINT DATE: 2/7/22 RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
15194.889

BORING B-4

BORING B-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		Brown, silty GRAVEL (GM) with sand; non-plastic; fine sand; fine to coarse, angular to subangular gravel; damp						
		FILL						
2.0				0.2			20	
4.0								
6.0		becomes black						Dark staining, possible heavy oil
				0.2	B4-8		30	
8.0								Tar paper encountered
10.0								
		Brown, silty SAND (SM); non-plastic; fine sand; damp		0.1	B4-12		60	
12.0								
14.0								
		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Direct Push
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: N. Thornton
COMPLETED: 1/20/22

BORING LOG-ENV CORE 15194.889 B1-6 20220124.GPJ DATATMPL.GDT PRINT DATE: 2/7/22 RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

BORING B-5

PBS PROJECT NUMBER:
15194.889

BORING B-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		ASPHALT						
		BASE ROCK						
		Brown, silty GRAVEL (GM) with sand; non-plastic; fine sand; fine to coarse, subrounded to angular gravel; damp			B5-2			
2.0		**FILL**		0.0			60	
4.0								
6.0								
8.0				0.0			60	
		Brown SILT (ML) with some clay; medium plasticity; damp						
10.0								
12.0					B5-12		100	
				0.0				
14.0								
		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Direct Push
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: N. Thornton
COMPLETED: 1/20/22

BORING LOG-ENV CORE 15194.889 B1-6 20220124.GPJ DATATMPL.GDT PRINT DATE: 2/7/22 RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
15194.889

BORING B-6

BORING B-6 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		Brown, silty GRAVEL (GM) with sand; non-plastic; fine sand; fine to coarse, subangular to angular gravel; damp		0.2	B6-2			Mild weathered petroleum odor and sheen from 1 to 2 feet bgs
2.0		**FILL**		0.2			30	No field evidence of contamination below 2 feet bgs
4.0								
6.0				0.1				
8.0		Brown SILT (ML) with some clay; medium plasticity; damp		0.0			60	
10.0					B6-10			
12.0				0.0			100	
14.0								
16.0		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
18.0								
20.0								

BORING METHOD: Direct Push
DRILLED BY: Cascade Drilling, Inc.
BORING BIT DIAMETER: 2¼-inch

LOGGED BY: N. Thornton
COMPLETED: 1/20/22

BORING LOG-ENV CORE 15194.889 B1-6 20220124.GPJ DATATMPL.GDT PRINT DATE: 2/7/22 RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
15194.889

BORING B-7

BORING B-7 LOCATION:
North of B-1 (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		ASPHALT						
		Brown, poorly graded GRAVEL (GP-GM) with silt and sand; non-plastic; coarse sand; fine to coarse, subangular to angular gravel; dry						No field evidence of contamination throughout
2.0		**FILL**					100	
4.0				0.0				
6.0								
8.0		Brown SILT (ML); low plasticity; damp					100	
10.0				0.0				
12.0				0.0	B7-12.5		100	
14.0								
		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Hollow-Stem Auger
DRILLED BY: Western States Soil Conservation
BORING BIT DIAMETER: 6-inch

LOGGED BY: N. Thornton
COMPLETED: 3/02/23

BORING LOG-ENV CORE 15194.889 B7-9 20230330.GPJ DATATMPL.GDT PRINT DATE: 3/30/23:RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
15194.889

BORING B-8

BORING B-8 LOCATION:
East of B-1 (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		ASPHALT						
		Brown, sandy SILT (ML) with gravel; non-plastic; coarse sand; fine to coarse, subangular to angular gravel; damp						No field evidence of contamination throughout
2.0		**FILL**					100	
4.0				0.0				
6.0								
8.0							100	
		Brown SILT (ML) with some clay; medium plasticity; damp						
10.0				0.0				
12.0				0.0	B8-12.5		100	
14.0								
		Final depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Hollow-Stem Auger
DRILLED BY: Western States Soil Conservation
BORING BIT DIAMETER: 6-inch

LOGGED BY: N. Thornton
COMPLETED: 3/02/23

BORING LOG-ENV CORE 15194.889 B7-9 20230330.GPJ DATATMPL.GDT PRINT DATE: 3/30/23:RPG

PBS

801 SW HARVEY MILK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
15194.889

BORING B-9

BORING B-9 LOCATION:
South of B-4 (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		ASPHALT						
		Brown, poorly graded GRAVEL (GP-GM) with silt and sand; non-plastic; coarse sand; fine to coarse, subangular to angular gravel; damp						No field evidence of contamination throughout
2.0		**FILL**					100	
				0.0				
4.0								
6.0								
							100	
8.0				0.0	B9-8			
		Brown, silty SAND (SM); non-plastic; fine sand; damp						
10.0		Final depth 10.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
12.0								
14.0								
16.0								
18.0								
20.0								

BORING METHOD: Hollow-Stem Auger
DRILLED BY: Western States Soil Conservation
BORING BIT DIAMETER: 6-inch

LOGGED BY: N. Thornton
COMPLETED: 3/02/23

BORING LOG-ENV CORE 15194.889 B7-9 20230330.GPJ DATATMPL.GDT PRINT DATE: 3/30/23:RPG

Appendix G
Beneficial Water Use Determination

Beneficial Water Use Determination

801 SW Harvey Milk Street

wl_cour	wl_nbr	well_tag	name_company	street	city	zip	type_	depth_	depth_drill	completed	post_static	start_date	complete_date	towns	towr	rang	range	sctn	qtr16	qtr40	tax_lot	street_of_well	location_c	longitude	latitude	Comments
MULT	1046		U S BANKCORP	555 SW OAK ST	PORTL	97204	W	26	55	55	23	7/2/1981	7/18/1981	1	N	1	E	34	SW	SE			MULT			Used for dewatering
MULT	1047		U S BANKCORP	555 SW OAK ST	PORTL	97204	W	22	39	39	7.5	7/6/1981	7/13/1981	1	N	1	E	34	SW	SE			MULT			Used for dewatering
MULT	1048		U S BANKCORP	555 SW OAK ST	PORTL	97204	W	33	55	55	24	7/15/1981	7/22/1981	1	N	1	E	34	SW	SE			MULT			Used for dewatering
MULT	1050		U S BANCORP	555 SW OAK ST	PORTL	97204	W	25	55	55	23	7/20/1981	7/22/1981	1	N	1	E	34	SW	SE			MULT			Used for dewatering
MULT	1051		U S NATIONAL BANK	309 SW 6TH AVE	PORTL	97204	W	41	100	55	24	2/4/1972	2/28/1972	1	N	1	E	34	SW	SE			MULT			Use listed as "Other"
MULT	1052		U S NATIONAL BANK	309 SW 6TH AVE	PORTL	97204	W	24	60	35	20.6	2/29/1972	3/29/1972	1	N	1	E	34	SW	SE			MULT			Use listed as "Other"
MULT	1059		LIPMAN WOLF AND CO.	521 SW 5TH AVE			W		40	40		12/31/1911	12/31/1911	1	N	1	E	34	SW	SW			MULT	-122.6773	45.52017	"Dug Well" Constructed in 1911. Unlikely to be in-use
MULT	1062		DIRKS MEDICAL CENTER	10TH AND WASHINGTON ST	PORTL	97208	W		418	418		11/1/1957	1/10/1958	1	N	1	E	34	SW	SW			MULT	-122.6817	45.52116	Use listed as "Other"
MULT	1065		UNITED ARTISTS THEATRE	PARK & WASHINGTON	PORTL	97208	W		149	149	28			1	N	1	E	34	SW	SW			MULT			Well was deepened to 403 feet
MULT	1069		DAY LITE MEAT MARKET	101 NW THIRD AVE	PORTL	97209	W		180	180		12/31/1939	12/31/1939	1	N	1	E	34	SW	NE			MULT			Greater than 1/4 mile
MULT	1074		NORTHWEST NATURAL GAS	123 NE FLANDERS ST	PORTL	97209	W		400	0		11/5/1982	11/11/1982	1	N	1	E	34	SE				MULT			Greater than 1/4 mile
MULT	1076		COLISEUM GARDENS	1520 NE 2ND AVE	PORTL	97232	W		361	361	118.5	4/11/1966	5/19/1966	1	N	1	E	34	NE	NE			MULT			Greater than 1/4 mile
MULT	1077		COLISEUM GARDENS	1520 NE 2ND AVE	PORTL	97232	W		332	332	118	2/17/1966	4/4/1966	1	N	1	E	34	NE	NE			MULT			Greater than 1/4 mile
MULT	1078		LA GRANDE CREAMERY		PORTL	97208	W		61	61				1	N	1	E	34	SE	NW			MULT			Location unknown
MULT	1084		HOFFMAN CONSTRUCTION (	6TH & WASHINGTON STS	PORTL	97208	W		161	161	11.3	5/1/1959	6/8/1959	1	N	1	E	34	SW	SW			MULT			Use listed as "Other"
MULT	2835		THE UNITED STATES NATION	PO BOX 4410	PORTL	97208	W		544	544	28	12/31/1947	12/31/1947	1	N	1	E	34	SW	SW			MULT			Use of water listed as being for air conditioning
MULT	5135		NORTHWEST NATURAL GAS CO.				W	0	460	460	0	8/11/1986	8/15/1986	1	N	1	E	34					MULT	-122.6724	45.52519	Noted on log to not be a water well; used as ground bed
MULT	73525	67874	CITY OF PORTLAND; BUREAU	1120 SW 5TH AVE	PORTL	97204	W		60	60	21.9	6/29/2004	7/6/2004	1	N	1	E	34	SE	SE	3600	ANKENY SHAFT AT WA	MULT			Greater than 1/4 mile
MULT	78268	47957	CITY OF PORTLAND; BUREAU	1120 SW 5TH AVE 1000	PORTL	97204	W	32	51	51	22	5/24/2005	5/25/2005	1	N	1	E	34	SE	SW	3700	36 SW FRONT AVE	MULT			Greater than 1/4 mile
MULT	78269	47960	CITY OF PORTLAND; BUREAU	1120 SW 5TH AVE 1000	PORTL	97204	W	34	51	51	23	6/2/2005	6/7/2005	1	N	1	E	34	SE	SW	3700	36 SW FRONT AVE	MULT			Greater than 1/4 mile
MULT	78270	47959	CITY OF PORTLAND; BUREAU	1120 SW 5TH AVE 1000	PORTL	97204	W	33	51	51	22	5/31/2005	6/1/2005	1	N	1	E	34	SE	SW	3700	36 SW FRONT AVE	MULT			Greater than 1/4 mile
MULT	78271	47958	CITY OF PORTLAND; BUREAU	1120 SW 5TH AVE 1000	PORTL	97204	W	32	51	51	22	5/26/2005	5/27/2005	1	N	1	E	34	SE	SW	3700	36 SW FRONT AVE	MULT			Greater than 1/4 mile

Appendix H
Laboratory Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
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www.friedmanandbruya.com

January 27, 2022

Nick Thornton, Project Manager
PBS Engineering and Environmental, Inc.
4412 S Corbett
Portland, OR 97239

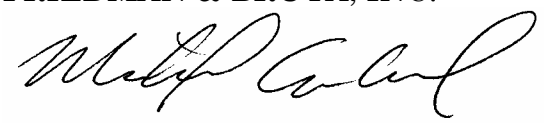
Dear Mr Thornton:

Included are the results from the testing of material submitted on January 21, 2022 from the 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290 project. There are 28 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
PBP0127R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 21, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	PBS Engineering and Environmental
201290 -01	B1-12
201290 -02	B1-15
201290 -03	B2-12
201290 -04	B3-12
201290 -05	B4-8
201290 -06	B4-12
201290 -07	B5-2
201290 -08	B5-12
201290 -09	B6-2
201290 -10	B6-10

The PAH results for B1-12, B4-8, and B6-2 and the VOC results for sample B4-8 will be issued in an additional report.

All quality control requirements were acceptable.

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290
Date Extracted: 01/21/22
Date Analyzed: 01/24/22

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
B1-12 201290-01 1/20	1,800	82
B1-15 201290-02	<5	79
B2-12 201290-03	<5	74
B3-12 201290-04	<5	72
B4-8 201290-05	55	83
B4-12 201290-06	<5	72
B5-2 201290-07	<5	69
B5-12 201290-08	<5	70
B6-2 201290-09	<5	73
B6-10 201290-10	<5	72
Method Blank 02-149 MB2	<5	78

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290
Date Extracted: 01/24/22
Date Analyzed: 01/24/22

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 56-165)
B1-12 201290-01	2,500	<250	103
B1-15 201290-02	<50	<250	115
B2-12 201290-03	<50	<250	117
B3-12 201290-04	<50	<250	116
B4-8 201290-05 1/10	8,900 x	28,000	ip
B4-12 201290-06	<50	<250	104
B5-2 201290-07	<50	<250	107
B5-12 201290-08	<50	<250	118
B6-2 201290-09	820 x	2,400	106
B6-10 201290-10	<50	<250	105
Method Blank 02-238 MB	<50	<250	101

Analysis For Total Metals By EPA Method 6020B

Client ID:	B1-12	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-01
Date Analyzed:	01/24/22	Data File:	201290-01.037
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	28.1

Analysis For Total Metals By EPA Method 6020B

Client ID:	B1-15	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-02
Date Analyzed:	01/24/22	Data File:	201290-02.040
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	7.84

Analysis For Total Metals By EPA Method 6020B

Client ID:	B2-12	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-03
Date Analyzed:	01/24/22	Data File:	201290-03.041
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	8.18

Analysis For Total Metals By EPA Method 6020B

Client ID:	B3-12	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-04
Date Analyzed:	01/24/22	Data File:	201290-04.042
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	12.3

Analysis For Total Metals By EPA Method 6020B

Client ID:	B4-8	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-05
Date Analyzed:	01/24/22	Data File:	201290-05.043
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.37
Barium	50.2
Cadmium	<1
Chromium	32.9
Lead	220
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	B4-12	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-06
Date Analyzed:	01/24/22	Data File:	201290-06.044
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	6.38

Analysis For Total Metals By EPA Method 6020B

Client ID:	B5-2	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-07
Date Analyzed:	01/24/22	Data File:	201290-07.047
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	4.64

Analysis For Total Metals By EPA Method 6020B

Client ID:	B5-12	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-08
Date Analyzed:	01/24/22	Data File:	201290-08.048
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	10.9

Analysis For Total Metals By EPA Method 6020B

Client ID:	B6-2	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-09
Date Analyzed:	01/24/22	Data File:	201290-09.049
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.29
Barium	80.2
Cadmium	<1
Chromium	13.0
Lead	3.65
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	B6-10	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	201290-10
Date Analyzed:	01/24/22	Data File:	201290-10.050
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	12.0

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	NA	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/24/22	Lab ID:	I2-51 mb
Date Analyzed:	01/24/22	Data File:	I2-51 mb.035
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	B1-12	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/21/22	Lab ID:	201290-01
Date Analyzed:	01/21/22	Data File:	012120.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	90	109
Toluene-d8	108	89	112
4-Bromofluorobenzene	104	84	115

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	0.88
Acetone	<5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	2.8
Hexane	<0.25	o-Xylene	0.71
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	0.61
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	2.6
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	5.7
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<1	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	0.24
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	17
Benzene	<0.03	sec-Butylbenzene	1.0
Trichloroethene	<0.02	p-Isopropyltoluene	0.87
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<1	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	0.34
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	B6-2	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/21/22	Lab ID:	201290-09
Date Analyzed:	01/21/22	Data File:	012121.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	90	109
Toluene-d8	98	89	112
4-Bromofluorobenzene	100	84	115

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<1	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<1	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	B6-10	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/21/22	Lab ID:	201290-10
Date Analyzed:	01/21/22	Data File:	012122.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	90	109
Toluene-d8	98	89	112
4-Bromofluorobenzene	101	84	115

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<1	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<1	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/21/22	Lab ID:	02-129 mb
Date Analyzed:	01/21/22	Data File:	012105.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	90	109
Toluene-d8	97	89	112
4-Bromofluorobenzene	99	84	115

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<1	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<1	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	B4-8	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/26/22	Lab ID:	201290-05 1/6
Date Analyzed:	01/26/22	Data File:	012605.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	68	23	120

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	B6-2	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/26/22	Lab ID:	201290-09 1/6
Date Analyzed:	01/26/22	Data File:	012606.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	68	23	120

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/26/22	Lab ID:	01-244 mb2 1/6
Date Analyzed:	01/26/22	Data File:	012604.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	78	23	120

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 201264-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	20	115	61-153

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 201290-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	96	96	63-146	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	98	79-144

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 201290-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	<5	88	93	75-125	6
Barium	mg/kg (ppm)	50	101	92	108	75-125	16
Cadmium	mg/kg (ppm)	10	<5	91	99	75-125	8
Chromium	mg/kg (ppm)	50	11.1	88	92	75-125	4
Lead	mg/kg (ppm)	50	19.1	87	92	75-125	6
Mercury	mg/kg (ppm	5	<5	90	94	75-125	4
Selenium	mg/kg (ppm)	5	<5	82	90	75-125	9
Silver	mg/kg (ppm)	10	<5	90	98	75-125	9

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	85	80-120
Barium	mg/kg (ppm)	50	93	80-120
Cadmium	mg/kg (ppm)	10	94	80-120
Chromium	mg/kg (ppm)	50	97	80-120
Lead	mg/kg (ppm)	50	96	80-120
Mercury	mg/kg (ppm)	5	94	80-120
Selenium	mg/kg (ppm)	5	88	80-120
Silver	mg/kg (ppm)	10	97	80-120

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 201288-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	1	<0.5	17	19	10-142	11
Chloromethane	mg/kg (ppm)	1	<0.5	46	52	10-126	12
Vinyl chloride	mg/kg (ppm)	1	<0.05	47	52	10-138	10
Bromomethane	mg/kg (ppm)	1	<0.5	68	73	10-163	7
Chloroethane	mg/kg (ppm)	1	<0.5	64	71	10-176	10
Trichlorofluoromethane	mg/kg (ppm)	1	<0.5	57	61	10-176	7
Acetone	mg/kg (ppm)	5	<5	79	86	10-163	8
1,1-Dichloroethene	mg/kg (ppm)	1	<0.05	75	83	10-160	10
Hexane	mg/kg (ppm)	1	<0.25	53	56	10-137	6
Methylene chloride	mg/kg (ppm)	1	<0.5	71	79	10-156	11
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	<0.05	78	87	21-145	11
trans-1,2-Dichloroethene	mg/kg (ppm)	1	<0.05	76	85	14-137	11
1,1-Dichloroethane	mg/kg (ppm)	1	<0.05	79	86	19-140	8
2,2-Dichloropropane	mg/kg (ppm)	1	<0.05	96	104	10-158	8
cis-1,2-Dichloroethene	mg/kg (ppm)	1	<0.05	84	92	25-135	9
Chloroform	mg/kg (ppm)	1	<0.05	81	87	21-145	7
2-Butanone (MEK)	mg/kg (ppm)	5	<1	80	84	19-147	5
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	<0.05	83	91	12-160	9
1,1,1-Trichloroethane	mg/kg (ppm)	1	<0.05	76	86	10-156	12
1,1-Dichloropropene	mg/kg (ppm)	1	<0.05	77	84	17-140	9
Carbon tetrachloride	mg/kg (ppm)	1	<0.05	65	73	9-164	12
Benzene	mg/kg (ppm)	1	<0.03	83	91	29-129	9
Trichloroethene	mg/kg (ppm)	1	<0.02	81	89	21-139	9
1,2-Dichloropropane	mg/kg (ppm)	1	<0.05	80	87	30-135	8
Bromodichloromethane	mg/kg (ppm)	1	<0.05	71	78	23-155	9
Dibromomethane	mg/kg (ppm)	1	<0.05	86	95	23-145	10
4-Methyl-2-pentanone	mg/kg (ppm)	5	<1	86	93	24-155	8
cis-1,3-Dichloropropene	mg/kg (ppm)	1	<0.05	78	87	28-144	11
Toluene	mg/kg (ppm)	1	<0.05	94	101	35-130	7
trans-1,3-Dichloropropene	mg/kg (ppm)	1	<0.05	86	90	26-149	5
1,1,2-Trichloroethane	mg/kg (ppm)	1	<0.05	89	98	10-205	10
2-Hexanone	mg/kg (ppm)	5	<0.5	91	96	15-166	5
1,3-Dichloropropane	mg/kg (ppm)	1	<0.05	94	101	31-137	7
Tetrachloroethene	mg/kg (ppm)	1	<0.025	96	105	20-133	9
Dibromochloromethane	mg/kg (ppm)	1	<0.05	76	82	28-150	8
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	<0.05	96	104	28-142	8
Chlorobenzene	mg/kg (ppm)	1	<0.05	95	101	32-129	6
Ethylbenzene	mg/kg (ppm)	1	<0.05	97	103	32-137	6
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	1	<0.05	82	90	31-143	9
m,p-Xylene	mg/kg (ppm)	2	<0.1	99	106	34-136	7
o-Xylene	mg/kg (ppm)	1	<0.05	95	101	33-134	6
Styrene	mg/kg (ppm)	1	<0.05	95	102	35-137	7
Isopropylbenzene	mg/kg (ppm)	1	<0.05	98	104	31-142	6
Bromoform	mg/kg (ppm)	1	<0.05	73	79	21-156	8
n-Propylbenzene	mg/kg (ppm)	1	<0.05	102	103	23-146	1
Bromobenzene	mg/kg (ppm)	1	<0.05	99	103	34-130	4
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	<0.05	97	101	18-149	4
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	1	<0.05	99	102	28-140	3
1,2,3-Trichloropropane	mg/kg (ppm)	1	<0.05	97	99	25-144	2
2-Chlorotoluene	mg/kg (ppm)	1	<0.05	98	100	31-134	2
4-Chlorotoluene	mg/kg (ppm)	1	<0.05	101	105	31-136	4
tert-Butylbenzene	mg/kg (ppm)	1	<0.05	101	105	30-137	4
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	<0.05	98	103	10-182	5
sec-Butylbenzene	mg/kg (ppm)	1	<0.05	101	105	23-145	4
p-Isopropyltoluene	mg/kg (ppm)	1	<0.05	102	107	21-149	5
1,3-Dichlorobenzene	mg/kg (ppm)	1	<0.05	100	105	30-131	5
1,4-Dichlorobenzene	mg/kg (ppm)	1	<0.05	101	105	29-129	4
1,2-Dichlorobenzene	mg/kg (ppm)	1	<0.05	98	101	31-132	3
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	1	<0.5	77	83	11-161	7
1,2,4-Trichlorobenzene	mg/kg (ppm)	1	<0.25	98	103	22-142	5
Hexachlorobutadiene	mg/kg (ppm)	1	<0.25	104	110	10-142	6
Naphthalene	mg/kg (ppm)	1	<0.05	94	98	14-157	4
1,2,3-Trichlorobenzene	mg/kg (ppm)	1	<0.25	99	102	20-144	3

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	1	33	10-146
Chloromethane	mg/kg (ppm)	1	53	27-133
Vinyl chloride	mg/kg (ppm)	1	63	22-139
Bromomethane	mg/kg (ppm)	1	77	38-114
Chloroethane	mg/kg (ppm)	1	75	9-163
Trichlorofluoromethane	mg/kg (ppm)	1	78	10-196
Acetone	mg/kg (ppm)	5	90	52-141
1,1-Dichloroethene	mg/kg (ppm)	1	98	47-128
Hexane	mg/kg (ppm)	1	85	43-142
Methylene chloride	mg/kg (ppm)	1	86	10-184
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	88	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	1	95	67-129
1,1-Dichloroethane	mg/kg (ppm)	1	94	68-115
2,2-Dichloropropane	mg/kg (ppm)	1	123	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	1	100	72-127
Chloroform	mg/kg (ppm)	1	95	66-120
2-Butanone (MEK)	mg/kg (ppm)	5	91	30-197
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	98	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	1	93	62-131
1,1-Dichloropropene	mg/kg (ppm)	1	95	69-128
Carbon tetrachloride	mg/kg (ppm)	1	84	60-139
Benzene	mg/kg (ppm)	1	96	71-118
Trichloroethene	mg/kg (ppm)	1	92	63-121
1,2-Dichloropropane	mg/kg (ppm)	1	94	72-127
Bromodichloromethane	mg/kg (ppm)	1	85	57-126
Dibromomethane	mg/kg (ppm)	1	102	62-123
4-Methyl-2-pentanone	mg/kg (ppm)	5	98	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	1	92	67-122
Toluene	mg/kg (ppm)	1	108	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	1	98	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	1	101	64-115
2-Hexanone	mg/kg (ppm)	5	98	33-152
1,3-Dichloropropane	mg/kg (ppm)	1	108	72-130
Tetrachloroethene	mg/kg (ppm)	1	112	72-114
Dibromochloromethane	mg/kg (ppm)	1	90	55-121
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	110	74-132
Chlorobenzene	mg/kg (ppm)	1	106	76-111
Ethylbenzene	mg/kg (ppm)	1	111	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	1	97	64-121
m,p-Xylene	mg/kg (ppm)	2	113	78-122
o-Xylene	mg/kg (ppm)	1	108	77-124
Styrene	mg/kg (ppm)	1	106	74-126
Isopropylbenzene	mg/kg (ppm)	1	110	76-127
Bromoform	mg/kg (ppm)	1	86	56-132
n-Propylbenzene	mg/kg (ppm)	1	113	74-124
Bromobenzene	mg/kg (ppm)	1	114	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	112	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	1	113	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	1	110	61-137
2-Chlorotoluene	mg/kg (ppm)	1	111	74-121
4-Chlorotoluene	mg/kg (ppm)	1	113	75-122
tert-Butylbenzene	mg/kg (ppm)	1	116	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	112	76-125
sec-Butylbenzene	mg/kg (ppm)	1	114	71-130
p-Isopropyltoluene	mg/kg (ppm)	1	116	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	1	116	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	1	113	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	1	111	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	1	95	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	1	113	64-135
Hexachlorobutadiene	mg/kg (ppm)	1	122	50-153
Naphthalene	mg/kg (ppm)	1	107	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	1	113	63-138

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 201308-02 1/6 (Matrix Spike) 1/6

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.25	<0.02	93	29-125
Aroclor 1260	mg/kg (ppm)	0.25	<0.02	91	25-137

Laboratory Code: Laboratory Control Sample 1/6

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.25	102	104	55-137	2
Aroclor 1260	mg/kg (ppm)	0.25	107	108	51-150	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

201290

SAMPLE CHAIN OF CUSTODY

ME 01-21-22

Page # 1 of 1 CI2

Report To Nick Thornton

Company PBS

Address 4412 S Corbett

City, State, ZIP Portland

Phone _____ Email _____

SAMPLERS (*signature*)

PROJECT NAME: 801 SW Harvey Milk

PO #: 15194.889 Phase 13 Task 2

REMARKS

Project Specific RLs - Yes / No

INVOICE TO

TURNAROUND TIME

Standard Turnaround BC3

RUSH 2 day

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Archive Samples

Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total Pb 6010	RCRA Metals				Notes
						ANALYSES REQUESTED											● per NT
B1-12	01 A-B	1/20/22	0800	soil	2	X	X		X	(X)		X					24hr per NT
B1-15	02		0805		2	X	X					X					1/25/22 ME
B2-12	03		0840		2	X	X					X					(X) Std TAT
B3-12	04		0930		2	X	X					X					per NT 1/26/22 ME
B4-8	05		1015		2	X	X		(X)	(X)	●	X	(X)				
B4-12	06		1020		2	X	X					X					
B5-2	07		1115		2	X	X					X					
B5-12	08		1120		2	X	X					X					
BC-2	09		1310		2	X	X		X	(X)	●	X	(X)				
BC-10	10		1315		2	X	X		X			X					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Nick Thornton	PBS	1/21/22	1430
Received by:	Liz Webster-Bruya	FB	1/21/22	1046
Relinquished by:				
Received by:			Samples received at	4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 27, 2022

Nick Thornton, Project Manager
PBS Engineering and Environmental, Inc.
4412 S Corbett
Portland, OR 97239

Dear Mr Thornton:

Included are the results from the testing of material submitted on January 21, 2022 from the 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
PBP0127R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 21, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	PBS Engineering and Environmental
201289 -01	SV-01

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

The ethanol and acetone concentration in sample SV-01 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	SV-01	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Collected:	01/20/22	Lab ID:	201289-01 1/6.9
Date Analyzed:	01/24/22	Data File:	012412.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<8.3	<4.8	1,2-Dichloropropane	<1.6	<0.34
Dichlorodifluoromethane	<3.4	<0.69	1,4-Dioxane	<2.5	<0.69
Chloromethane	<26	<12	2,2,4-Trimethylpentane	<32	<6.9
F-114	<4.8	<0.69	Methyl methacrylate	<28	<6.9
Vinyl chloride	<1.8	<0.69	Heptane	<28	<6.9
1,3-Butadiene	0.87	0.39	Bromodichloromethane	<0.46	<0.069
Butane	<33	<14	Trichloroethene	1.4	0.26
Bromomethane	<16	<4.1	cis-1,3-Dichloropropene	<3.1	<0.69
Chloroethane	<18	<6.9	4-Methyl-2-pentanone	<28	<6.9
Vinyl bromide	<3	<0.69	trans-1,3-Dichloropropene	<3.1	<0.69
Ethanol	190 ve	98 ve	Toluene	<130	<34
Acrolein	3.9	1.7	1,1,2-Trichloroethane	<0.38	<0.069
Pentane	<20	<6.9	2-Hexanone	<28	<6.9
Trichlorofluoromethane	<16	<2.8	Tetrachloroethene	<47	<6.9
Acetone	350 ve	150 ve	Dibromochloromethane	<0.59	<0.069
2-Propanol	<59	<24	1,2-Dibromoethane (EDB)	<0.53	<0.069
1,1-Dichloroethene	<2.7	<0.69	Chlorobenzene	<3.2	<0.69
trans-1,2-Dichloroethene	<2.7	<0.69	Ethylbenzene	9.1	2.1
Methylene chloride	<240	<69	1,1,2,2-Tetrachloroethane	<0.95	<0.14
t-Butyl alcohol (TBA)	<84	<28	Nonane	<36	<6.9
3-Chloropropene	<11	<3.4	Isopropylbenzene	<17	<3.4
CFC-113	<5.3	<0.69	2-Chlorotoluene	<36	<6.9
Carbon disulfide	120	37	Propylbenzene	<17	<3.4
Methyl t-butyl ether (MTBE)	<12	<3.4	4-Ethyltoluene	<17	<3.4
Vinyl acetate	<49	<14	m,p-Xylene	31	7.2
1,1-Dichloroethane	<2.8	<0.69	o-Xylene	11	2.6
cis-1,2-Dichloroethene	<2.7	<0.69	Styrene	<5.9	<1.4
Hexane	<24	<6.9	Bromoform	<14	<1.4
Chloroform	<0.34	<0.069	Benzyl chloride	<0.36	<0.069
Ethyl acetate	<50	<14	1,3,5-Trimethylbenzene	<17	<3.4
Tetrahydrofuran	<4.1	<1.4	1,2,4-Trimethylbenzene	<17	<3.4
2-Butanone (MEK)	50	17	1,3-Dichlorobenzene	<4.1	<0.69
1,2-Dichloroethane (EDC)	<0.28	<0.069	1,4-Dichlorobenzene	<1.6	<0.26
1,1,1-Trichloroethane	<3.8	<0.69	1,2-Dichlorobenzene	<4.1	<0.69
Carbon tetrachloride	<2.2	<0.34	1,2,4-Trichlorobenzene	<5.1	<0.69
Benzene	3.0	0.93	Naphthalene	<1.8	<0.34
Cyclohexane	<48	<14	Hexachlorobutadiene	1.5	0.14
Gasoline Range Organics	3,900	950			

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	801 SW Harvey Milk 15194.889
Date Collected:	Not Applicable	Lab ID:	02-0202 MB
Date Analyzed:	01/24/22	Data File:	012411.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	95	70	130

Compounds:	Concentration ug/m3	ppbv	Compounds:	Concentration ug/m3	ppbv
Propene	<1.2	<0.7	1,2-Dichloropropane	<0.23	<0.05
Dichlorodifluoromethane	<0.49	<0.1	1,4-Dioxane	<0.36	<0.1
Chloromethane	<3.7	<1.8	2,2,4-Trimethylpentane	<4.7	<1
F-114	<0.7	<0.1	Methyl methacrylate	<4.1	<1
Vinyl chloride	<0.26	<0.1	Heptane	<4.1	<1
1,3-Butadiene	<0.044	<0.02	Bromodichloromethane	<0.067	<0.01
Butane	<4.8	<2	Trichloroethene	<0.11	<0.02
Bromomethane	<2.3	<0.6	cis-1,3-Dichloropropene	<0.45	<0.1
Chloroethane	<2.6	<1	4-Methyl-2-pentanone	<4.1	<1
Vinyl bromide	<0.44	<0.1	trans-1,3-Dichloropropene	<0.45	<0.1
Ethanol	<7.5	<4	Toluene	<19	<5
Acrolein	<0.11	<0.05	1,1,2-Trichloroethane	<0.055	<0.01
Pentane	<3	<1	2-Hexanone	<4.1	<1
Trichlorofluoromethane	<2.2	<0.4	Tetrachloroethene	<6.8	<1
Acetone	<4.8	<2	Dibromochloromethane	<0.085	<0.01
2-Propanol	<8.6	<3.5	1,2-Dibromoethane (EDB)	<0.077	<0.01
1,1-Dichloroethene	<0.4	<0.1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Methylene chloride	<35	<10	1,1,2,2-Tetrachloroethane	<0.14	<0.02
t-Butyl alcohol (TBA)	<12	<4	Nonane	<5.2	<1
3-Chloropropene	<1.6	<0.5	Isopropylbenzene	<2.5	<0.5
CFC-113	<0.77	<0.1	2-Chlorotoluene	<5.2	<1
Carbon disulfide	<6.2	<2	Propylbenzene	<2.5	<0.5
Methyl t-butyl ether (MTBE)	<1.8	<0.5	4-Ethyltoluene	<2.5	<0.5
Vinyl acetate	<7	<2	m,p-Xylene	<0.87	<0.2
1,1-Dichloroethane	<0.4	<0.1	o-Xylene	<0.43	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	Styrene	<0.85	<0.2
Hexane	<3.5	<1	Bromoform	<2.1	<0.2
Chloroform	<0.049	<0.01	Benzyl chloride	<0.052	<0.01
Ethyl acetate	<7.2	<2	1,3,5-Trimethylbenzene	<2.5	<0.5
Tetrahydrofuran	<0.59	<0.2	1,2,4-Trimethylbenzene	<2.5	<0.5
2-Butanone (MEK)	<2.9	<1	1,3-Dichlorobenzene	<0.6	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01	1,4-Dichlorobenzene	<0.23	<0.038
1,1,1-Trichloroethane	<0.55	<0.1	1,2-Dichlorobenzene	<0.6	<0.1
Carbon tetrachloride	<0.31	<0.05	1,2,4-Trichlorobenzene	<0.74	<0.1
Benzene	<0.32	<0.1	Naphthalene	<0.26	<0.05
Cyclohexane	<6.9	<2	Hexachlorobutadiene	<0.21	<0.02
Gasoline Range Organics	<330	<80			

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289
Date Extracted: 01/25/22
Date Analyzed: 01/25/22

RESULTS FROM THE ANALYSIS OF AIR SAMPLES FOR HELIUM USING METHOD ASTM D1946

Results Reported as % Helium

Sample ID Laboratory ID	Helium
SV-01 201289-01	25
Method Blank 02-0210 MB	<0.6

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 201289-01 1/6.9 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Propene	ug/m3	<8.3	<8.3	nm
Dichlorodifluoromethane	ug/m3	<3.4	<3.4	nm
Chloromethane	ug/m3	<26	<26	nm
F-114	ug/m3	<4.8	<4.8	nm
Vinyl chloride	ug/m3	<1.8	<1.8	nm
1,3-Butadiene	ug/m3	0.87	0.93	7
Butane	ug/m3	<33	<33	nm
Bromomethane	ug/m3	<16	<16	nm
Chloroethane	ug/m3	<18	<18	nm
Vinyl bromide	ug/m3	<3	<3	nm
Ethanol	ug/m3	190	200	5
Acrolein	ug/m3	3.9	3.8	3
Pentane	ug/m3	<20	<20	nm
Trichlorofluoromethane	ug/m3	<16	<16	nm
Acetone	ug/m3	350	370	6
2-Propanol	ug/m3	<59	<59	nm
1,1-Dichloroethene	ug/m3	<2.7	<2.7	nm
trans-1,2-Dichloroethene	ug/m3	<2.7	<2.7	nm
Methylene chloride	ug/m3	<240	<240	nm
t-Butyl alcohol (TBA)	ug/m3	<84	<84	nm
3-Chloropropene	ug/m3	<11	<11	nm
CFC-113	ug/m3	<5.3	<5.3	nm
Carbon disulfide	ug/m3	120	120	0
Methyl t-butyl ether (MTBE)	ug/m3	<12	<12	nm
Vinyl acetate	ug/m3	<49	<49	nm
1,1-Dichloroethane	ug/m3	<2.8	<2.8	nm
cis-1,2-Dichloroethene	ug/m3	<2.7	<2.7	nm
Hexane	ug/m3	<24	<24	nm
Chloroform	ug/m3	<0.34	<0.34	nm
Ethyl acetate	ug/m3	<50	<50	nm
Tetrahydrofuran	ug/m3	<4.1	<4.1	nm
2-Butanone (MEK)	ug/m3	50	52	4
1,2-Dichloroethane (EDC)	ug/m3	<0.28	<0.28	nm
1,1,1-Trichloroethane	ug/m3	<3.8	<3.8	nm
Carbon tetrachloride	ug/m3	<2.2	<2.2	nm
Benzene	ug/m3	3.0	3.0	0
Cyclohexane	ug/m3	<48	<48	nm
1,2-Dichloropropane	ug/m3	<1.6	<1.6	nm
1,4-Dioxane	ug/m3	<2.5	<2.5	nm
2,2,4-Trimethylpentane	ug/m3	<32	<32	nm

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 201289-01 1/6.9 (Duplicate, continued)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Methyl methacrylate	ug/m3	<28	<28	nm
Heptane	ug/m3	<28	<28	nm
Bromodichloromethane	ug/m3	<0.46	<0.46	nm
Trichloroethene	ug/m3	1.4	1.4	0
cis-1,3-Dichloropropene	ug/m3	<3.1	<3.1	nm
4-Methyl-2-pentanone	ug/m3	<28	<28	nm
trans-1,3-Dichloropropene	ug/m3	<3.1	<3.1	nm
Toluene	ug/m3	<130	<130	nm
1,1,2-Trichloroethane	ug/m3	<0.38	<0.38	nm
2-Hexanone	ug/m3	<28	<28	nm
Tetrachloroethene	ug/m3	<47	<47	nm
Dibromochloromethane	ug/m3	<0.59	<0.59	nm
1,2-Dibromoethane (EDB)	ug/m3	<0.53	<0.53	nm
Chlorobenzene	ug/m3	<3.2	<3.2	nm
Ethylbenzene	ug/m3	9.1	9.1	0
1,1,2,2-Tetrachloroethane	ug/m3	<0.95	<0.95	nm
Nonane	ug/m3	<36	<36	nm
Isopropylbenzene	ug/m3	<17	<17	nm
2-Chlorotoluene	ug/m3	<36	<36	nm
Propylbenzene	ug/m3	<17	<17	nm
4-Ethyltoluene	ug/m3	<17	<17	nm
m,p-Xylene	ug/m3	31	31	0
o-Xylene	ug/m3	11	11	0
Styrene	ug/m3	<5.9	<5.9	nm
Bromoform	ug/m3	<14	<14	nm
Benzyl chloride	ug/m3	<0.36	<0.36	nm
1,3,5-Trimethylbenzene	ug/m3	<17	<17	nm
1,2,4-Trimethylbenzene	ug/m3	<17	<17	nm
1,3-Dichlorobenzene	ug/m3	<4.1	<4.1	nm
1,4-Dichlorobenzene	ug/m3	<1.6	<1.6	nm
1,2-Dichlorobenzene	ug/m3	<4.1	<4.1	nm
1,2,4-Trichlorobenzene	ug/m3	<5.1	<5.1	nm
Naphthalene	ug/m3	<1.8	<1.8	nm
Hexachlorobutadiene	ug/m3	1.5	<1.5	nm

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Propene	ug/m3	23	79	70-130
Dichlorodifluoromethane	ug/m3	67	118	70-130
Chloromethane	ug/m3	28	109	70-130
F-114	ug/m3	94	111	70-130
Vinyl chloride	ug/m3	35	89	70-130
1,3-Butadiene	ug/m3	30	96	70-130
Butane	ug/m3	32	99	70-130
Bromomethane	ug/m3	52	122	70-130
Chloroethane	ug/m3	36	104	70-130
Vinyl bromide	ug/m3	59	98	70-130
Ethanol	ug/m3	25	112	70-130
Acrolein	ug/m3	31	97	70-130
Pentane	ug/m3	40	96	70-130
Trichlorofluoromethane	ug/m3	76	106	70-130
Acetone	ug/m3	32	103	70-130
2-Propanol	ug/m3	33	95	70-130
1,1-Dichloroethene	ug/m3	54	99	70-130
trans-1,2-Dichloroethene	ug/m3	54	99	70-130
Methylene chloride	ug/m3	94	94	70-130
t-Butyl alcohol (TBA)	ug/m3	41	94	70-130
3-Chloropropene	ug/m3	42	89	70-130
CFC-113	ug/m3	100	104	70-130
Carbon disulfide	ug/m3	42	94	70-130
Methyl t-butyl ether (MTBE)	ug/m3	49	97	70-130
Vinyl acetate	ug/m3	48	92	70-130
1,1-Dichloroethane	ug/m3	55	102	70-130
cis-1,2-Dichloroethene	ug/m3	54	99	70-130
Hexane	ug/m3	48	95	70-130
Chloroform	ug/m3	66	103	70-130
Ethyl acetate	ug/m3	49	100	70-130
Tetrahydrofuran	ug/m3	40	90	70-130
2-Butanone (MEK)	ug/m3	40	100	70-130
1,2-Dichloroethane (EDC)	ug/m3	55	109	70-130
1,1,1-Trichloroethane	ug/m3	74	107	70-130
Carbon tetrachloride	ug/m3	85	109	70-130
Benzene	ug/m3	43	97	70-130
Cyclohexane	ug/m3	46	91	70-130
1,2-Dichloropropane	ug/m3	62	99	70-130
1,4-Dioxane	ug/m3	49	99	70-130
2,2,4-Trimethylpentane	ug/m3	63	102	70-130

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: Laboratory Control Sample (continued)

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Methyl methacrylate	ug/m3	55	99	70-130
Heptane	ug/m3	55	100	70-130
Bromodichloromethane	ug/m3	90	108	70-130
Trichloroethene	ug/m3	73	102	70-130
cis-1,3-Dichloropropene	ug/m3	61	105	70-130
4-Methyl-2-pentanone	ug/m3	55	94	70-130
trans-1,3-Dichloropropene	ug/m3	61	109	70-130
Toluene	ug/m3	51	104	70-130
1,1,2-Trichloroethane	ug/m3	74	106	70-130
2-Hexanone	ug/m3	55	101	70-130
Tetrachloroethene	ug/m3	92	114	70-130
Dibromochloromethane	ug/m3	120	110	70-130
1,2-Dibromoethane (EDB)	ug/m3	100	103	70-130
Chlorobenzene	ug/m3	62	106	70-130
Ethylbenzene	ug/m3	59	97	70-130
1,1,2,2-Tetrachloroethane	ug/m3	93	101	70-130
Nonane	ug/m3	71	93	70-130
Isopropylbenzene	ug/m3	66	104	70-130
2-Chlorotoluene	ug/m3	70	103	70-130
Propylbenzene	ug/m3	66	102	70-130
4-Ethyltoluene	ug/m3	66	99	70-130
m,p-Xylene	ug/m3	120	101	70-130
o-Xylene	ug/m3	59	103	70-130
Styrene	ug/m3	58	95	70-130
Bromoform	ug/m3	140	110	70-130
Benzyl chloride	ug/m3	70	106	70-130
1,3,5-Trimethylbenzene	ug/m3	66	103	70-130
1,2,4-Trimethylbenzene	ug/m3	66	98	70-130
1,3-Dichlorobenzene	ug/m3	81	109	70-130
1,4-Dichlorobenzene	ug/m3	81	101	70-130
1,2-Dichlorobenzene	ug/m3	81	104	70-130
1,2,4-Trichlorobenzene	ug/m3	100	102	70-130
Naphthalene	ug/m3	71	95	70-130
Hexachlorobutadiene	ug/m3	140	115	70-130

Date of Report: 01/27/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13, Task 2, F&BI 201289

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR HELIUM USING METHOD ASTM D1946

Laboratory Code: 201289-01 (Duplicate)

Analyte	Sample Result (%)	Duplicate Result (%)	Relative Percent Difference	Acceptance Criteria
Helium	25	33	28	0-20

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

201289

SAMPLE CHAIN OF CUSTODY

01-21-22

Page # 1 of 1

Report To Nick Thornton

Company PBS

Address 4412 S Corbett

City, State, ZIP

Phone Email

SAMPLERS (*signature*)

PROJECT NAME & ADDRESS: 801 SW Harney Milk

PO #: 15194.889 Phase 13 Task 2

NOTES:

INVOICE TO

TURNAROUND TIME
Standard
RUSH 2 day
Rush charges authorized by:

SAMPLE DISPOSAL
Default: Clean after 3 days
Archive (Fee may apply)

SAMPLE INFORMATION										ANALYSIS REQUESTED						
Sample Name	Lab ID	Canister ID	Flow Cont. ID	Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One)	Date Sampled	Initial Vac. ("Hg)	Field Initial Time	Final Vac. ("Hg)	Field Final Time	TO15 Full Scan	TO15 BTEXN	TO15 cVOCs	APH	Helium		Notes
SV-01	01		240	IA / SG	1/20/22	28	1232	7	1257	X				X		
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Nick Thornton	PBS	1/20/22	1430
Received by:		Ann W Bruya	FRB	1/21/22	1030
Relinquished by:					
Received by:					

Samples received at 18 °C

Samples received at ___ °C

FORMS\COC\COCTO-15.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 4, 2022

Nick Thornton, Project Manager
PBS Engineering and Environmental, Inc.
4412 S Corbett
Portland, OR 97239

Dear Mr Thornton:

Included are the additional results from the testing of material submitted on January 21, 2022 from the 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290 project. There are 11 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
PBS0204R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 21, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	PBS Engineering and Environmental
201290 -01	B1-12
201290 -02	B1-15
201290 -03	B2-12
201290 -04	B3-12
201290 -05	B4-8
201290 -06	B4-12
201290 -07	B5-2
201290 -08	B5-12
201290 -09	B6-2
201290 -10	B6-10

The 8260D methylene chloride calibration standard failed the acceptance criteria. The data were flagged accordingly.

The 8260D matrix spike, matrix spike duplicate, and laboratory control sample exceeded the acceptance criteria for trichlorofluoromethane. The compound was not detected, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	B4-8	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/28/22	Lab ID:	201290-05
Date Analyzed:	01/28/22	Data File:	012812.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	90	109
Toluene-d8	99	89	112
4-Bromofluorobenzene	102	84	115

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5 ca	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<1	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<1	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	0.53
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/28/22	Lab ID:	02-209 mb
Date Analyzed:	01/28/22	Data File:	012805.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	RF

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	90	109
Toluene-d8	100	89	112
4-Bromofluorobenzene	101	84	115

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<1	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<1	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	B1-12	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/28/22	Lab ID:	201290-01 1/250
Date Analyzed:	01/31/22	Data File:	013118.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	20 d	24	111
Phenol-d6	34 d	37	116
Nitrobenzene-d5	100 d ca	38	117
2-Fluorobiphenyl	85 d	45	117
2,4,6-Tribromophenol	0 d	11	158
Terphenyl-d14	80 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	54
2-Methylnaphthalene	150
1-Methylnaphthalene	79
Acenaphthylene	<0.5
Acenaphthene	<0.5
Fluorene	<0.5
Phenanthrene	0.80
Anthracene	<0.5
Fluoranthene	<0.5
Pyrene	<0.5
Benz(a)anthracene	<0.5
Chrysene	<0.5
Benzo(a)pyrene	<0.5
Benzo(b)fluoranthene	<0.5
Benzo(k)fluoranthene	<0.5
Indeno(1,2,3-cd)pyrene	<0.5
Dibenz(a,h)anthracene	<0.5
Benzo(g,h,i)perylene	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	B4-8	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/28/22	Lab ID:	201290-05 1/1000
Date Analyzed:	01/31/22	Data File:	013120.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	14 d	24	111
Phenol-d6	14 d	37	116
Nitrobenzene-d5	60 d ca	38	117
2-Fluorobiphenyl	80 d	45	117
2,4,6-Tribromophenol	0 d	11	158
Terphenyl-d14	100 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	14
2-Methylnaphthalene	9.4
1-Methylnaphthalene	15
Acenaphthylene	39
Acenaphthene	35
Fluorene	51
Phenanthrene	470
Anthracene	100
Fluoranthene	460
Pyrene	540
Benz(a)anthracene	260
Chrysene	280
Benzo(a)pyrene	250
Benzo(b)fluoranthene	270
Benzo(k)fluoranthene	98
Indeno(1,2,3-cd)pyrene	110
Dibenz(a,h)anthracene	28
Benzo(g,h,i)perylene	84

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	B6-2	Client:	PBS Engineering and Environmental
Date Received:	01/21/22	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/28/22	Lab ID:	201290-09 1/25
Date Analyzed:	01/31/22	Data File:	013115.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	58 d	24	111
Phenol-d6	83 d	37	116
Nitrobenzene-d5	88 d ca	38	117
2-Fluorobiphenyl	91 d	45	117
2,4,6-Tribromophenol	86 d	11	158
Terphenyl-d14	103 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	801 SW Harvey Milk 15194.889
Date Extracted:	01/28/22	Lab ID:	02-264 mb 1/5
Date Analyzed:	01/28/22	Data File:	012816.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	81	39	103
Phenol-d6	88	48	109
Nitrobenzene-d5	88	23	138
2-Fluorobiphenyl	90	50	150
2,4,6-Tribromophenol	80	40	127
Terphenyl-d14	97	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 02/04/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 201290-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	1	<0.5	29	35	10-142	19
Chloromethane	mg/kg (ppm)	1	<0.5	60	64	10-126	6
Vinyl chloride	mg/kg (ppm)	1	<0.05	58	68	10-138	16
Bromomethane	mg/kg (ppm)	1	<0.5	85	89	10-163	5
Chloroethane	mg/kg (ppm)	1	<0.5	73	85	10-176	15
Trichlorofluoromethane	mg/kg (ppm)	1	<0.5	196 vo	228 vo	10-176	15
Acetone	mg/kg (ppm)	5	<5	89	96	10-163	8
1,1-Dichloroethene	mg/kg (ppm)	1	<0.05	77	84	10-160	9
Hexane	mg/kg (ppm)	1	<0.25	59	71	10-137	18
Methylene chloride	mg/kg (ppm)	1	<0.5	97	101	10-156	4
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	<0.05	89	96	21-145	8
trans-1,2-Dichloroethene	mg/kg (ppm)	1	<0.05	78	88	14-137	12
1,1-Dichloroethane	mg/kg (ppm)	1	<0.05	84	91	19-140	8
2,2-Dichloropropane	mg/kg (ppm)	1	<0.05	98	108	10-158	10
cis-1,2-Dichloroethene	mg/kg (ppm)	1	<0.05	85	94	25-135	10
Chloroform	mg/kg (ppm)	1	<0.05	84	92	21-145	9
2-Butanone (MEK)	mg/kg (ppm)	5	<1	91	99	19-147	8
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	<0.05	85	93	12-160	9
1,1,1-Trichloroethane	mg/kg (ppm)	1	<0.05	85	92	10-156	8
1,1-Dichloropropene	mg/kg (ppm)	1	<0.05	77	87	17-140	12
Carbon tetrachloride	mg/kg (ppm)	1	<0.05	81	92	9-164	13
Benzene	mg/kg (ppm)	1	<0.03	80	89	29-129	11
Trichloroethene	mg/kg (ppm)	1	<0.02	77	88	21-139	13
1,2-Dichloropropane	mg/kg (ppm)	1	<0.05	84	94	30-135	11
Bromodichloromethane	mg/kg (ppm)	1	<0.05	86	94	23-155	9
Dibromomethane	mg/kg (ppm)	1	<0.05	84	95	23-145	12
4-Methyl-2-pentanone	mg/kg (ppm)	5	<1	95	102	24-155	7
cis-1,3-Dichloropropene	mg/kg (ppm)	1	<0.05	86	95	28-144	10
Toluene	mg/kg (ppm)	1	<0.05	80	91	35-130	13
trans-1,3-Dichloropropene	mg/kg (ppm)	1	<0.05	85	95	26-149	11
1,1,2-Trichloroethane	mg/kg (ppm)	1	<0.05	88	97	10-205	10
2-Hexanone	mg/kg (ppm)	5	<0.5	94	105	15-166	11
1,3-Dichloropropane	mg/kg (ppm)	1	<0.05	86	97	31-137	12
Tetrachloroethene	mg/kg (ppm)	1	<0.025	73	88	20-133	19
Dibromochloromethane	mg/kg (ppm)	1	<0.05	83	94	28-150	12
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	<0.05	80	95	28-142	17
Chlorobenzene	mg/kg (ppm)	1	<0.05	81	93	32-129	14
Ethylbenzene	mg/kg (ppm)	1	<0.05	79	92	32-137	15
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	1	<0.05	84	96	31-143	13
m,p-Xylene	mg/kg (ppm)	2	<0.1	77	90	34-136	16
o-Xylene	mg/kg (ppm)	1	<0.05	77	90	33-134	16
Styrene	mg/kg (ppm)	1	<0.05	79	94	35-137	17
Isopropylbenzene	mg/kg (ppm)	1	<0.05	80	93	31-142	15
Bromoform	mg/kg (ppm)	1	<0.05	83	94	21-156	12
n-Propylbenzene	mg/kg (ppm)	1	<0.05	77	91	23-146	17
Bromobenzene	mg/kg (ppm)	1	<0.05	76	88	34-130	15
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	<0.05	73	87	18-149	17
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	1	<0.05	88	98	28-140	11
1,2,3-Trichloropropane	mg/kg (ppm)	1	<0.05	87	99	25-144	13
2-Chlorotoluene	mg/kg (ppm)	1	<0.05	77	89	31-134	14
4-Chlorotoluene	mg/kg (ppm)	1	<0.05	75	89	31-136	17
tert-Butylbenzene	mg/kg (ppm)	1	<0.05	80	93	30-137	15
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	<0.05	73	87	10-182	17
sec-Butylbenzene	mg/kg (ppm)	1	<0.05	77	93	23-145	19
p-Isopropyltoluene	mg/kg (ppm)	1	<0.05	75	91	21-149	19
1,3-Dichlorobenzene	mg/kg (ppm)	1	<0.05	74	87	30-131	16
1,4-Dichlorobenzene	mg/kg (ppm)	1	<0.05	74	88	29-129	17
1,2-Dichlorobenzene	mg/kg (ppm)	1	<0.05	77	87	31-132	12
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	1	<0.5	80	89	11-161	11
1,2,4-Trichlorobenzene	mg/kg (ppm)	1	<0.25	67	82	22-142	20
Hexachlorobutadiene	mg/kg (ppm)	1	<0.25	82	100	10-142	20
Naphthalene	mg/kg (ppm)	1	0.48	104 b	138 b	14-157	28 b
1,2,3-Trichlorobenzene	mg/kg (ppm)	1	<0.25	69	82	20-144	17

Date of Report: 02/04/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	1	51	10-146
Chloromethane	mg/kg (ppm)	1	66	27-133
Vinyl chloride	mg/kg (ppm)	1	75	22-139
Bromomethane	mg/kg (ppm)	1	95	38-114
Chloroethane	mg/kg (ppm)	1	88	9-163
Trichlorofluoromethane	mg/kg (ppm)	1	253 vo	10-196
Acetone	mg/kg (ppm)	5	93	52-141
1,1-Dichloroethene	mg/kg (ppm)	1	92	47-128
Hexane	mg/kg (ppm)	1	85	43-142
Methylene chloride	mg/kg (ppm)	1	66	10-184
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	95	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	1	93	67-129
1,1-Dichloroethane	mg/kg (ppm)	1	94	68-115
2,2-Dichloropropane	mg/kg (ppm)	1	119	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	1	96	72-127
Chloroform	mg/kg (ppm)	1	96	66-120
2-Butanone (MEK)	mg/kg (ppm)	5	96	30-197
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	96	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	1	99	62-131
1,1-Dichloropropene	mg/kg (ppm)	1	94	69-128
Carbon tetrachloride	mg/kg (ppm)	1	99	60-139
Benzene	mg/kg (ppm)	1	94	71-118
Trichloroethene	mg/kg (ppm)	1	93	63-121
1,2-Dichloropropane	mg/kg (ppm)	1	98	72-127
Bromodichloromethane	mg/kg (ppm)	1	99	57-126
Dibromomethane	mg/kg (ppm)	1	99	62-123
4-Methyl-2-pentanone	mg/kg (ppm)	5	99	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	1	100	67-122
Toluene	mg/kg (ppm)	1	98	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	1	102	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	1	101	64-115
2-Hexanone	mg/kg (ppm)	5	100	33-152
1,3-Dichloropropane	mg/kg (ppm)	1	100	72-130
Tetrachloroethene	mg/kg (ppm)	1	101	72-114
Dibromochloromethane	mg/kg (ppm)	1	101	55-121
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	99	74-132
Chlorobenzene	mg/kg (ppm)	1	100	76-111
Ethylbenzene	mg/kg (ppm)	1	100	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	1	100	64-121
m,p-Xylene	mg/kg (ppm)	2	101	78-122
o-Xylene	mg/kg (ppm)	1	101	77-124
Styrene	mg/kg (ppm)	1	100	74-126
Isopropylbenzene	mg/kg (ppm)	1	102	76-127
Bromoform	mg/kg (ppm)	1	99	56-132
n-Propylbenzene	mg/kg (ppm)	1	100	74-124
Bromobenzene	mg/kg (ppm)	1	100	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	1	100	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	1	104	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	1	101	61-137
2-Chlorotoluene	mg/kg (ppm)	1	99	74-121
4-Chlorotoluene	mg/kg (ppm)	1	100	75-122
tert-Butylbenzene	mg/kg (ppm)	1	100	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	1	100	76-125
sec-Butylbenzene	mg/kg (ppm)	1	100	71-130
p-Isopropyltoluene	mg/kg (ppm)	1	100	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	1	101	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	1	101	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	1	101	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	1	99	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	1	99	64-135
Hexachlorobutadiene	mg/kg (ppm)	1	101	50-153
Naphthalene	mg/kg (ppm)	1	100	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	1	98	63-138

Date of Report: 02/04/22
Date Received: 01/21/22
Project: 801 SW Harvey Milk 15194.889 Phase 13 Task 2, F&BI 201290

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 201309-02 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.83	<0.01	80	78	50-150	3
2-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	85	83	50-150	2
1-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	87	86	50-150	1
Acenaphthylene	mg/kg (ppm)	0.83	<0.01	83	83	50-150	0
Acenaphthene	mg/kg (ppm)	0.83	<0.01	85	85	50-150	0
Fluorene	mg/kg (ppm)	0.83	<0.01	90	91	50-150	1
Phenanthrene	mg/kg (ppm)	0.83	<0.01	84	86	50-150	2
Anthracene	mg/kg (ppm)	0.83	<0.01	85	86	50-150	1
Fluoranthene	mg/kg (ppm)	0.83	<0.01	87	88	50-150	1
Pyrene	mg/kg (ppm)	0.83	<0.01	89	90	50-150	1
Benz(a)anthracene	mg/kg (ppm)	0.83	<0.01	90	89	50-150	1
Chrysene	mg/kg (ppm)	0.83	<0.01	89	88	50-150	1
Benzo(a)pyrene	mg/kg (ppm)	0.83	<0.01	82	81	50-150	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	<0.01	95	93	50-150	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	<0.01	92	91	50-150	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	<0.01	82	78	50-150	5
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	<0.01	85	84	50-150	1
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	<0.01	82	80	50-150	2

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.83	88	61-102
2-Methylnaphthalene	mg/kg (ppm)	0.83	88	62-108
1-Methylnaphthalene	mg/kg (ppm)	0.83	90	62-108
Acenaphthylene	mg/kg (ppm)	0.83	90	61-111
Acenaphthene	mg/kg (ppm)	0.83	93	61-110
Fluorene	mg/kg (ppm)	0.83	95	62-114
Phenanthrene	mg/kg (ppm)	0.83	93	64-112
Anthracene	mg/kg (ppm)	0.83	93	63-111
Fluoranthene	mg/kg (ppm)	0.83	94	66-115
Pyrene	mg/kg (ppm)	0.83	96	65-112
Benz(a)anthracene	mg/kg (ppm)	0.83	97	64-116
Chrysene	mg/kg (ppm)	0.83	96	66-119
Benzo(a)pyrene	mg/kg (ppm)	0.83	86	62-116
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	92	61-118
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	95	65-119
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	115	64-130
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	119	67-131
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	120	67-126

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

201290

SAMPLE CHAIN OF CUSTODY

ME 01-21-22

Page # 1 of 1 CI2

Report To Nick Thornton

Company PBS

Address 4412 S Corbett

City, State, ZIP Portland

Phone _____ Email _____

SAMPLERS (*signature*)

PROJECT NAME: 801 SW Harvey Milk

PO #: 15194.889 Phase 13 Task 2

REMARKS

Project Specific RLs - Yes / No

INVOICE TO

TURNAROUND TIME

Standard Turnaround BC3

RUSH 2 day

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Archive Samples

Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total Pb 6010	RCRA Metals				Notes
						ANALYSES REQUESTED											● per NT
B1-12	01 A-B	1/20/22	0800	soil	2	X	X		X	(X)		X					24hr per NT
B1-15	02		0805		2	X	X					X					1/25/22 ME
B2-12	03		0840		2	X	X					X					(X) Std TAT
B3-12	04		0930		2	X	X					X					per NT 1/26/22 ME
B4-8	05		1015		2	X	X		(X)	(X)	●	X	(X)				
B4-12	06		1020		2	X	X					X					
B5-2	07		1115		2	X	X					X					
B5-12	08		1120		2	X	X					X					
BC-2	09		1310		2	X	X		X	(X)	●	X	(X)				
BC-10	10		1315		2	X	X		X			X					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Nick Thornton	PBS	1/21/22	1430
Received by:	Liz Webster-Bruya	FB	1/21/22	1046
Relinquished by:				
Received by:			Samples received at	4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

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

ANALYTICAL REPORT

Thursday, March 16, 2023

Nick Thornton
PBS Engineering and Environmental
4412 S Corbett Ave
Portland, OR 97239

RE: A3C0135 - SW Harvey Milk St - 15194.889

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

Enclosed are the results of analyses for work order A3C0135, which was received by the laboratory on 3/3/2023 at 12:35:00PM.

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

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

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler	5.0 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

Jason Woodcock, Project Manager

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

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

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B7-12.5	A3C0135-01	Soil	03/02/23 13:45	03/03/23 12:35
B8-12.5	A3C0135-02	Soil	03/02/23 14:30	03/03/23 12:35
B9-8.0	A3C0135-03	Soil	03/02/23 15:15	03/03/23 12:35
Drum Profile	A3C0135-04	Soil	03/02/23 15:30	03/03/23 12:35

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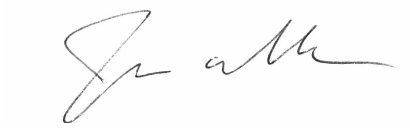

Jason Woodcock, Project Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-12.5 (A3C0135-01)				**Matrix: Soil**		**Batch: 23C0512**		**CONT**
Diesel	ND	---	25.2	mg/kg dry	1	03/14/23 21:32	NWTPH-Dx	
Oil	ND	---	50.5	mg/kg dry	1	03/14/23 21:32	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 84 %*		*Limits: 50-150 %*	*1*	*03/14/23 21:32*	*NWTPH-Dx*	
B8-12.5 (A3C0135-02)				**Matrix: Soil**		**Batch: 23C0512**		**CONT**
Diesel	ND	---	23.3	mg/kg dry	1	03/14/23 22:13	NWTPH-Dx	
Oil	ND	---	46.5	mg/kg dry	1	03/14/23 22:13	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 87 %*		*Limits: 50-150 %*	*1*	*03/14/23 22:13*	*NWTPH-Dx*	
B9-8.0 (A3C0135-03)				**Matrix: Soil**		**Batch: 23C0512**		**CONT**
Diesel	ND	---	27.1	mg/kg dry	1	03/14/23 22:33	NWTPH-Dx	
Oil	ND	---	54.3	mg/kg dry	1	03/14/23 22:33	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 83 %*		*Limits: 50-150 %*	*1*	*03/14/23 22:33*	*NWTPH-Dx*	

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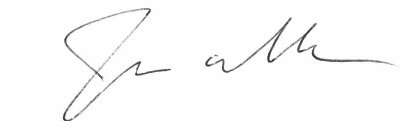

Jason Woodcock, Project Manager

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ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-12.5 (A3C0135-01)				**Matrix: Soil**		**Batch: 23C0190**		**CONT**
Gasoline Range Organics	ND	---	8.45	mg/kg dry	50	03/06/23 17:11	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*106 %*	*Limits: 50-150 %*	*1*	*03/06/23 17:11*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*105 %*	*50-150 %*	*1*	*03/06/23 17:11*	*NWTPH-Gx (MS)*	
B8-12.5 (A3C0135-02)				**Matrix: Soil**		**Batch: 23C0190**		**CONT**
Gasoline Range Organics	ND	---	6.88	mg/kg dry	50	03/06/23 17:36	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*105 %*	*Limits: 50-150 %*	*1*	*03/06/23 17:36*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*105 %*	*50-150 %*	*1*	*03/06/23 17:36*	*NWTPH-Gx (MS)*	
B9-8.0 (A3C0135-03)				**Matrix: Soil**		**Batch: 23C0190**		**CONT**
Gasoline Range Organics	ND	---	8.70	mg/kg dry	50	03/06/23 18:01	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*107 %*	*Limits: 50-150 %*	*1*	*03/06/23 18:01*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*105 %*	*50-150 %*	*1*	*03/06/23 18:01*	*NWTPH-Gx (MS)*	

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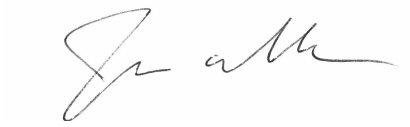

Jason Woodcock, Project Manager

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Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Drum Profile (A3C0135-04)				**Matrix: Soil**		**Batch: 23C0190**		**CONT**
Acetone	ND	---	1.40	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Acrylonitrile	ND	---	0.140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Benzene	ND	---	0.0140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Bromobenzene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Bromochloromethane	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Bromodichloromethane	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Bromoform	ND	---	0.140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Bromomethane	ND	---	0.702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
2-Butanone (MEK)	ND	---	0.702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
n-Butylbenzene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
sec-Butylbenzene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
tert-Butylbenzene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Carbon disulfide	ND	---	0.702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	ICV-02
Carbon tetrachloride	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Chlorobenzene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Chloroethane	ND	---	0.702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Chloroform	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Chloromethane	ND	---	0.351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
2-Chlorotoluene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
4-Chlorotoluene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Dibromochloromethane	ND	---	0.140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2-Dibromo-3-chloropropane	ND	---	0.351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Dibromomethane	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2-Dichlorobenzene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,3-Dichlorobenzene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,4-Dichlorobenzene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Dichlorodifluoromethane	ND	---	0.140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,1-Dichloroethane	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,1-Dichloroethene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
cis-1,2-Dichloroethene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
trans-1,2-Dichloroethene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2-Dichloropropane	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,3-Dichloropropane	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
2,2-Dichloropropane	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,1-Dichloropropene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
cis-1,3-Dichloropropene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
trans-1,3-Dichloropropene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	

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Jason Woodcock, Project Manager

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

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Drum Profile (A3C0135-04)				**Matrix: Soil**		**Batch: 23C0190**		**CONT**
Ethylbenzene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Hexachlorobutadiene	ND	---	0.140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
2-Hexanone	ND	---	0.702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Isopropylbenzene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
4-Isopropyltoluene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Methylene chloride	ND	---	0.702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
4-Methyl-2-pentanone (MiBK)	ND	---	0.702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Naphthalene	ND	---	0.140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
n-Propylbenzene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Styrene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,1,1,2-Tetrachloroethane	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,1,2,2-Tetrachloroethane	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Toluene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2,3-Trichlorobenzene	ND	---	0.351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2,4-Trichlorobenzene	ND	---	0.351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,1,1-Trichloroethane	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,1,2-Trichloroethane	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Trichloroethene (TCE)	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Trichlorofluoromethane	ND	---	0.140	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2,3-Trichloropropane	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Vinyl chloride	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
m,p-Xylene	ND	---	0.0702	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
o-Xylene	ND	---	0.0351	mg/kg dry	50	03/06/23 18:27	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*104 %*	*Limits:* *80-120 %*	*1*	*03/06/23 18:27*	*5035A/8260D*	
Toluene-d8 (Surr)			*99 %*	*80-120 %*	*1*	*03/06/23 18:27*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*03/06/23 18:27*	*5035A/8260D*	

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Jason Woodcock, Project Manager

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

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Drum Profile (A3C0135-04)				**Matrix: Soil**				
Batch: 23C0392								
Arsenic	ND	---	1.31	mg/kg dry	10	03/10/23 16:23	EPA 6020B	CONT
Barium	**66.9**	---	1.31	mg/kg dry	10	03/10/23 16:23	EPA 6020B	**CONT,Q-42**
Cadmium	ND	---	0.262	mg/kg dry	10	03/10/23 16:23	EPA 6020B	CONT
Chromium	**13.8**	---	1.31	mg/kg dry	10	03/10/23 16:23	EPA 6020B	**CONT**
Lead	**4.26**	---	0.262	mg/kg dry	10	03/10/23 16:23	EPA 6020B	**CONT**
Mercury	ND	---	0.105	mg/kg dry	10	03/10/23 16:23	EPA 6020B	CONT
Selenium	ND	---	1.31	mg/kg dry	10	03/10/23 16:23	EPA 6020B	CONT
Silver	ND	---	0.262	mg/kg dry	10	03/10/23 16:23	EPA 6020B	CONT

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PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B7-12.5 (A3C0135-01)				**Matrix: Soil**		**Batch: 23C0213**		**CONT**
% Solids	**73.6**	---	1.00	%	1	03/07/23 06:30	EPA 8000D	
B8-12.5 (A3C0135-02)				**Matrix: Soil**		**Batch: 23C0213**		**CONT**
% Solids	**83.9**	---	1.00	%	1	03/07/23 06:30	EPA 8000D	
B9-8.0 (A3C0135-03)				**Matrix: Soil**		**Batch: 23C0213**		**CONT**
% Solids	**69.5**	---	1.00	%	1	03/07/23 06:30	EPA 8000D	
Drum Profile (A3C0135-04)				**Matrix: Soil**		**Batch: 23C0213**		**CONT**
% Solids	**83.1**	---	1.00	%	1	03/07/23 06:30	EPA 8000D	

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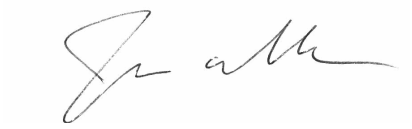

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QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0512 - EPA 3546 (Fuels)									Soil			
Blank (23C0512-BLK1)		Prepared: 03/14/23 10:01		Analyzed: 03/14/23 20:51								
NWTPH-Dx												
Diesel	ND	---	20.0	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	---	40.0	mg/kg wet	1	---	---	---	---	---	---	
Mineral Oil	ND	---	40.0	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 87 %*		*Limits: 50-150 %*			*Dilution: 1x*					
LCS (23C0512-BS1)		Prepared: 03/14/23 10:01		Analyzed: 03/14/23 21:11								
NWTPH-Dx												
Diesel	114	---	20.0	mg/kg wet	1	125	---	91	38 - 132%	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 94 %*		*Limits: 50-150 %*			*Dilution: 1x*					
Duplicate (23C0512-DUP1)		Prepared: 03/14/23 10:01		Analyzed: 03/14/23 21:52								**CONT**
QC Source Sample: B7-12.5 (A3C0135-01)												
NWTPH-Dx												
Diesel	ND	---	26.2	mg/kg dry	1	---	ND	---	---	---	30%	
Oil	ND	---	52.4	mg/kg dry	1	---	ND	---	---	---	30%	
Mineral Oil	ND	---	52.4	mg/kg dry	1	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		*Recovery: 88 %*		*Limits: 50-150 %*			*Dilution: 1x*					

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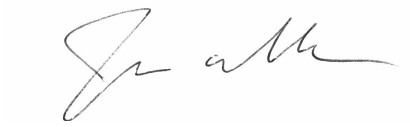

Jason Woodcock, Project Manager

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ORELAP ID: **OR100062**

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A									Soil			
Blank (23C0190-BLK1)		Prepared: 03/06/23 08:00		Analyzed: 03/06/23 10:50								
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	5.00	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 103 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*100 %*		*50-150 %*		*"*					
LCS (23C0190-BS2)		Prepared: 03/06/23 08:00		Analyzed: 03/06/23 10:24								
NWTPH-Gx (MS)												
Gasoline Range Organics	24.9	---	5.00	mg/kg wet	50	25.0	---	100	80 - 120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 101 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*100 %*		*50-150 %*		*"*					

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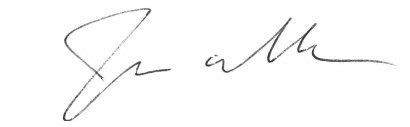

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ANALYTICAL REPORT

PBS Engineering and Environmental	Project: SW Harvey Milk St	
4412 S Corbett Ave	Project Number: 15194.889	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3C0135 - 03 16 23 1202

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A							Soil					
Blank (23C0190-BLK1)		Prepared: 03/06/23 08:00 Analyzed: 03/06/23 10:50										
5035A/8260D												
Acetone	ND	---	1.00	mg/kg wet	50	---	---	---	---	---	---	
Acrylonitrile	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	
Benzene	ND	---	0.0100	mg/kg wet	50	---	---	---	---	---	---	
Bromobenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Bromochloromethane	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Bromodichloromethane	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Bromoform	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	
Bromomethane	ND	---	0.500	mg/kg wet	50	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	0.500	mg/kg wet	50	---	---	---	---	---	---	
n-Butylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Carbon disulfide	ND	---	0.500	mg/kg wet	50	---	---	---	---	---	---	ICV-02
Carbon tetrachloride	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Chlorobenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Chloroethane	ND	---	0.500	mg/kg wet	50	---	---	---	---	---	---	
Chloroform	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Chloromethane	ND	---	0.250	mg/kg wet	50	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Dibromochloromethane	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	0.250	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Dibromomethane	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	

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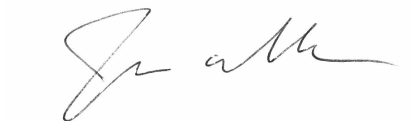

Jason Woodcock, Project Manager

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A							**Soil**					
Blank (23C0190-BLK1)		Prepared: 03/06/23 08:00		Analyzed: 03/06/23 10:50								
1,2-Dichloropropane	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	
2-Hexanone	ND	---	0.500	mg/kg wet	50	---	---	---	---	---	---	
Isopropylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Methylene chloride	ND	---	0.500	mg/kg wet	50	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	0.500	mg/kg wet	50	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	
n-Propylbenzene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Styrene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	0.250	mg/kg wet	50	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	0.250	mg/kg wet	50	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	0.100	mg/kg wet	50	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
Vinyl chloride	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
m,p-Xylene	ND	---	0.0500	mg/kg wet	50	---	---	---	---	---	---	
o-Xylene	ND	---	0.0250	mg/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 104 %*		*Limits: 80-120 %*					*Dilution: 1x*			

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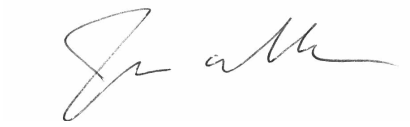

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ANALYTICAL REPORT

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4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A												**Soil**
Blank (23C0190-BLK1)			Prepared: 03/06/23 08:00		Analyzed: 03/06/23 10:50							
Surr: Toluene-d8 (Surr)			*Recovery: 99 %*		*Limits: 80-120 %*			*Dilution: 1x*				
4-Bromofluorobenzene (Surr)			*99 %*		*79-120 %*			*"*				
LCS (23C0190-BS1)			Prepared: 03/06/23 08:00		Analyzed: 03/06/23 09:59							
5035A/8260D												
Acetone	1.78	---	1.00	mg/kg wet	50	2.00	---	89	80 - 120%	---	---	
Acrylonitrile	0.988	---	0.100	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Benzene	1.02	---	0.0100	mg/kg wet	50	1.00	---	102	80 - 120%	---	---	
Bromobenzene	0.992	---	0.0250	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Bromochloromethane	1.01	---	0.0500	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
Bromodichloromethane	1.06	---	0.0500	mg/kg wet	50	1.00	---	106	80 - 120%	---	---	
Bromoform	1.19	---	0.100	mg/kg wet	50	1.00	---	119	80 - 120%	---	---	
Bromomethane	0.931	---	0.500	mg/kg wet	50	1.00	---	93	80 - 120%	---	---	
2-Butanone (MEK)	1.88	---	0.500	mg/kg wet	50	2.00	---	94	80 - 120%	---	---	
n-Butylbenzene	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
sec-Butylbenzene	1.01	---	0.0500	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
tert-Butylbenzene	0.938	---	0.0500	mg/kg wet	50	1.00	---	94	80 - 120%	---	---	
Carbon disulfide	0.636	---	0.500	mg/kg wet	50	1.00	---	**64**	**80 - 120%**	---	---	ICV-02, Q-55
Carbon tetrachloride	1.12	---	0.0500	mg/kg wet	50	1.00	---	112	80 - 120%	---	---	
Chlorobenzene	0.986	---	0.0250	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
Chloroethane	0.928	---	0.500	mg/kg wet	50	1.00	---	93	80 - 120%	---	---	
Chloroform	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
Chloromethane	0.854	---	0.250	mg/kg wet	50	1.00	---	85	80 - 120%	---	---	
2-Chlorotoluene	0.986	---	0.0500	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
4-Chlorotoluene	0.962	---	0.0500	mg/kg wet	50	1.00	---	96	80 - 120%	---	---	
Dibromochloromethane	1.05	---	0.100	mg/kg wet	50	1.00	---	105	80 - 120%	---	---	
1,2-Dibromo-3-chloropropane	0.982	---	0.250	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
1,2-Dibromoethane (EDB)	1.02	---	0.0500	mg/kg wet	50	1.00	---	102	80 - 120%	---	---	
Dibromomethane	1.04	---	0.0500	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
1,2-Dichlorobenzene	0.965	---	0.0250	mg/kg wet	50	1.00	---	96	80 - 120%	---	---	
1,3-Dichlorobenzene	0.985	---	0.0250	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
1,4-Dichlorobenzene	0.953	---	0.0250	mg/kg wet	50	1.00	---	95	80 - 120%	---	---	
Dichlorodifluoromethane	0.928	---	0.100	mg/kg wet	50	1.00	---	93	80 - 120%	---	---	

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Jason Woodcock, Project Manager

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

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A							**Soil**					
LCS (23C0190-BS1)		Prepared: 03/06/23 08:00		Analyzed: 03/06/23 09:59								
1,1-Dichloroethane	1.04	---	0.0250	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
1,2-Dichloroethane (EDC)	1.01	---	0.0250	mg/kg wet	50	1.00	---	101	80 - 120%	---	---	
1,1-Dichloroethene	0.834	---	0.0250	mg/kg wet	50	1.00	---	83	80 - 120%	---	---	
cis-1,2-Dichloroethene	0.974	---	0.0250	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
trans-1,2-Dichloroethene	0.991	---	0.0250	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
1,2-Dichloropropane	0.988	---	0.0250	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
1,3-Dichloropropane	0.974	---	0.0500	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
2,2-Dichloropropane	1.15	---	0.0500	mg/kg wet	50	1.00	---	115	80 - 120%	---	---	
1,1-Dichloropropene	1.06	---	0.0500	mg/kg wet	50	1.00	---	106	80 - 120%	---	---	
cis-1,3-Dichloropropene	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
trans-1,3-Dichloropropene	1.04	---	0.0500	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
Ethylbenzene	0.968	---	0.0250	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
Hexachlorobutadiene	1.02	---	0.100	mg/kg wet	50	1.00	---	102	80 - 120%	---	---	
2-Hexanone	1.75	---	0.500	mg/kg wet	50	2.00	---	87	80 - 120%	---	---	
Isopropylbenzene	1.00	---	0.0500	mg/kg wet	50	1.00	---	100	80 - 120%	---	---	
4-Isopropyltoluene	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
Methylene chloride	1.05	---	0.500	mg/kg wet	50	1.00	---	105	80 - 120%	---	---	
4-Methyl-2-pentanone (MiBK)	1.74	---	0.500	mg/kg wet	50	2.00	---	87	80 - 120%	---	---	
Methyl tert-butyl ether (MTBE)	1.03	---	0.0500	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
Naphthalene	0.892	---	0.100	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
n-Propylbenzene	0.978	---	0.0250	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
Styrene	0.955	---	0.0500	mg/kg wet	50	1.00	---	95	80 - 120%	---	---	
1,1,1,2-Tetrachloroethane	1.05	---	0.0250	mg/kg wet	50	1.00	---	105	80 - 120%	---	---	
1,1,2,2-Tetrachloroethane	0.931	---	0.0500	mg/kg wet	50	1.00	---	93	80 - 120%	---	---	
Tetrachloroethene (PCE)	1.04	---	0.0250	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
Toluene	0.945	---	0.0500	mg/kg wet	50	1.00	---	94	80 - 120%	---	---	
1,2,3-Trichlorobenzene	1.03	---	0.250	mg/kg wet	50	1.00	---	103	80 - 120%	---	---	
1,2,4-Trichlorobenzene	1.04	---	0.250	mg/kg wet	50	1.00	---	104	80 - 120%	---	---	
1,1,1-Trichloroethane	1.05	---	0.0250	mg/kg wet	50	1.00	---	105	80 - 120%	---	---	
1,1,2-Trichloroethane	0.974	---	0.0250	mg/kg wet	50	1.00	---	97	80 - 120%	---	---	
Trichloroethene (TCE)	1.08	---	0.0250	mg/kg wet	50	1.00	---	108	80 - 120%	---	---	
Trichlorofluoromethane	0.849	---	0.100	mg/kg wet	50	1.00	---	85	80 - 120%	---	---	
1,2,3-Trichloropropane	0.892	---	0.0500	mg/kg wet	50	1.00	---	89	80 - 120%	---	---	
1,2,4-Trimethylbenzene	0.994	---	0.0500	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	

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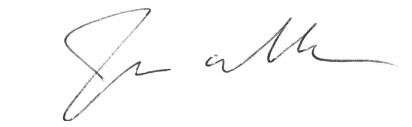

Jason Woodcock, Project Manager

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

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A							**Soil**					
LCS (23C0190-BS1)		Prepared: 03/06/23 08:00		Analyzed: 03/06/23 09:59								
1,3,5-Trimethylbenzene	1.02	---	0.0500	mg/kg wet	50	1.00	---	102	80 - 120%	---	---	
Vinyl chloride	0.988	---	0.0250	mg/kg wet	50	1.00	---	99	80 - 120%	---	---	
m,p-Xylene	1.97	---	0.0500	mg/kg wet	50	2.00	---	99	80 - 120%	---	---	
o-Xylene	0.980	---	0.0250	mg/kg wet	50	1.00	---	98	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery:*	*104 %*	*Limits:*	*80-120 %*		*Dilution:*	*1x*				
Toluene-d8 (Surr)			*99 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*101 %*		*79-120 %*			*"*				
Matrix Spike (23C0190-MS1)		Prepared: 03/02/23 15:30		Analyzed: 03/06/23 18:52								**CONT**
QC Source Sample: Drum Profile (A3C0135-04)												
5035A/8260D												
Acetone	2.72	---	1.40	mg/kg dry	50	2.81	ND	97	36 - 164%	---	---	
Acrylonitrile	1.42	---	0.140	mg/kg dry	50	1.40	ND	101	65 - 134%	---	---	
Benzene	1.50	---	0.0140	mg/kg dry	50	1.40	ND	107	77 - 121%	---	---	
Bromobenzene	1.35	---	0.0351	mg/kg dry	50	1.40	ND	96	78 - 121%	---	---	
Bromochloromethane	1.53	---	0.0702	mg/kg dry	50	1.40	ND	109	78 - 125%	---	---	
Bromodichloromethane	1.46	---	0.0702	mg/kg dry	50	1.40	ND	104	75 - 127%	---	---	
Bromoform	1.45	---	0.140	mg/kg dry	50	1.40	ND	103	67 - 132%	---	---	
Bromomethane	1.41	---	0.702	mg/kg dry	50	1.40	ND	101	53 - 143%	---	---	
2-Butanone (MEK)	2.87	---	0.702	mg/kg dry	50	2.81	ND	102	51 - 148%	---	---	
n-Butylbenzene	1.48	---	0.0702	mg/kg dry	50	1.40	ND	105	70 - 128%	---	---	
sec-Butylbenzene	1.45	---	0.0702	mg/kg dry	50	1.40	ND	103	73 - 126%	---	---	
tert-Butylbenzene	1.38	---	0.0702	mg/kg dry	50	1.40	ND	98	73 - 125%	---	---	
Carbon disulfide	1.52	---	0.702	mg/kg dry	50	1.40	ND	108	63 - 132%	---	---	ICV-02, Q-54
Carbon tetrachloride	1.55	---	0.0702	mg/kg dry	50	1.40	ND	110	70 - 135%	---	---	
Chlorobenzene	1.38	---	0.0351	mg/kg dry	50	1.40	ND	98	79 - 120%	---	---	
Chloroethane	1.62	---	0.702	mg/kg dry	50	1.40	ND	116	59 - 139%	---	---	
Chloroform	1.51	---	0.0702	mg/kg dry	50	1.40	ND	107	78 - 123%	---	---	
Chloromethane	1.36	---	0.351	mg/kg dry	50	1.40	ND	97	50 - 136%	---	---	
2-Chlorotoluene	1.36	---	0.0702	mg/kg dry	50	1.40	ND	97	75 - 122%	---	---	
4-Chlorotoluene	1.36	---	0.0702	mg/kg dry	50	1.40	ND	97	72 - 124%	---	---	
Dibromochloromethane	1.34	---	0.140	mg/kg dry	50	1.40	ND	95	74 - 126%	---	---	
1,2-Dibromo-3-chloropropane	1.23	---	0.351	mg/kg dry	50	1.40	ND	87	61 - 132%	---	---	

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Jason Woodcock, Project Manager

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A							**Soil**					
Matrix Spike (23C0190-MS1)		Prepared: 03/02/23 15:30		Analyzed: 03/06/23 18:52								**CONT**
QC Source Sample: Drum Profile (A3C0135-04)												
1,2-Dibromoethane (EDB)	1.38	---	0.0702	mg/kg dry	50	1.40	ND	98	78 - 122%	---	---	
Dibromomethane	1.43	---	0.0702	mg/kg dry	50	1.40	ND	102	78 - 125%	---	---	
1,2-Dichlorobenzene	1.32	---	0.0351	mg/kg dry	50	1.40	ND	94	78 - 121%	---	---	
1,3-Dichlorobenzene	1.34	---	0.0351	mg/kg dry	50	1.40	ND	96	77 - 121%	---	---	
1,4-Dichlorobenzene	1.31	---	0.0351	mg/kg dry	50	1.40	ND	93	75 - 120%	---	---	
Dichlorodifluoromethane	1.42	---	0.140	mg/kg dry	50	1.40	ND	101	29 - 149%	---	---	
1,1-Dichloroethane	1.58	---	0.0351	mg/kg dry	50	1.40	ND	112	76 - 125%	---	---	
1,2-Dichloroethane (EDC)	1.53	---	0.0351	mg/kg dry	50	1.40	ND	109	73 - 128%	---	---	
1,1-Dichloroethene	2.08	---	0.0351	mg/kg dry	50	1.40	ND	**148**	**70 - 131%**	---	---	Q-01
cis-1,2-Dichloroethene	1.45	---	0.0351	mg/kg dry	50	1.40	ND	103	77 - 123%	---	---	
trans-1,2-Dichloroethene	1.49	---	0.0351	mg/kg dry	50	1.40	ND	106	74 - 125%	---	---	
1,2-Dichloropropane	1.47	---	0.0351	mg/kg dry	50	1.40	ND	104	76 - 123%	---	---	
1,3-Dichloropropane	1.36	---	0.0702	mg/kg dry	50	1.40	ND	97	77 - 121%	---	---	
2,2-Dichloropropane	1.47	---	0.0702	mg/kg dry	50	1.40	ND	104	67 - 133%	---	---	
1,1-Dichloropropene	1.58	---	0.0702	mg/kg dry	50	1.40	ND	112	76 - 125%	---	---	
cis-1,3-Dichloropropene	1.41	---	0.0702	mg/kg dry	50	1.40	ND	100	74 - 126%	---	---	
trans-1,3-Dichloropropene	1.38	---	0.0702	mg/kg dry	50	1.40	ND	98	71 - 130%	---	---	
Ethylbenzene	1.40	---	0.0351	mg/kg dry	50	1.40	ND	100	76 - 122%	---	---	
Hexachlorobutadiene	1.35	---	0.140	mg/kg dry	50	1.40	ND	96	61 - 135%	---	---	
2-Hexanone	2.58	---	0.702	mg/kg dry	50	2.81	ND	92	53 - 145%	---	---	
Isopropylbenzene	1.41	---	0.0702	mg/kg dry	50	1.40	ND	101	68 - 134%	---	---	
4-Isopropyltoluene	1.43	---	0.0702	mg/kg dry	50	1.40	ND	102	73 - 127%	---	---	
Methylene chloride	1.49	---	0.702	mg/kg dry	50	1.40	ND	106	70 - 128%	---	---	
4-Methyl-2-pentanone (MiBK)	2.68	---	0.702	mg/kg dry	50	2.81	ND	95	65 - 135%	---	---	
Methyl tert-butyl ether (MTBE)	1.43	---	0.0702	mg/kg dry	50	1.40	ND	102	73 - 125%	---	---	
Naphthalene	1.19	---	0.140	mg/kg dry	50	1.40	ND	85	62 - 129%	---	---	
n-Propylbenzene	1.42	---	0.0351	mg/kg dry	50	1.40	ND	101	73 - 125%	---	---	
Styrene	1.33	---	0.0702	mg/kg dry	50	1.40	ND	95	76 - 124%	---	---	
1,1,1,2-Tetrachloroethane	1.40	---	0.0351	mg/kg dry	50	1.40	ND	100	78 - 125%	---	---	
1,1,2,2-Tetrachloroethane	1.32	---	0.0702	mg/kg dry	50	1.40	ND	94	70 - 124%	---	---	
Tetrachloroethene (PCE)	1.42	---	0.0351	mg/kg dry	50	1.40	ND	101	73 - 128%	---	---	
Toluene	1.36	---	0.0702	mg/kg dry	50	1.40	ND	97	77 - 121%	---	---	
1,2,3-Trichlorobenzene	1.34	---	0.351	mg/kg dry	50	1.40	ND	95	66 - 130%	---	---	

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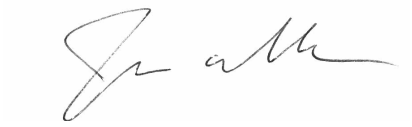

Jason Woodcock, Project Manager

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503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: SW Harvey Milk St	
4412 S Corbett Ave	Project Number: 15194.889	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3C0135 - 03 16 23 1202

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0190 - EPA 5035A							**Soil**					
Matrix Spike (23C0190-MS1)		Prepared: 03/02/23 15:30		Analyzed: 03/06/23 18:52								**CONT**
QC Source Sample: Drum Profile (A3C0135-04)												
1,2,4-Trichlorobenzene	1.35	---	0.351	mg/kg dry	50	1.40	ND	96	67 - 129%	---	---	
1,1,1-Trichloroethane	1.56	---	0.0351	mg/kg dry	50	1.40	ND	111	73 - 130%	---	---	
1,1,2-Trichloroethane	1.35	---	0.0351	mg/kg dry	50	1.40	ND	96	78 - 121%	---	---	
Trichloroethene (TCE)	1.50	---	0.0351	mg/kg dry	50	1.40	ND	107	77 - 123%	---	---	
Trichlorofluoromethane	2.60	---	0.140	mg/kg dry	50	1.40	ND	**185**	**62 - 140%**	---	---	Q-01
1,2,3-Trichloropropane	1.26	---	0.0702	mg/kg dry	50	1.40	ND	90	73 - 125%	---	---	
1,2,4-Trimethylbenzene	1.42	---	0.0702	mg/kg dry	50	1.40	ND	101	75 - 123%	---	---	
1,3,5-Trimethylbenzene	1.45	---	0.0702	mg/kg dry	50	1.40	ND	103	73 - 124%	---	---	
Vinyl chloride	1.51	---	0.0351	mg/kg dry	50	1.40	ND	108	56 - 135%	---	---	
m,p-Xylene	2.84	---	0.0702	mg/kg dry	50	2.81	ND	101	77 - 124%	---	---	
o-Xylene	1.39	---	0.0351	mg/kg dry	50	1.40	ND	99	77 - 123%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery:*	*102 %*	*Limits:*	*80-120 %*		*Dilution:*	*1x*				
Toluene-d8 (Surr)			*99 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*98 %*		*79-120 %*			*"*				

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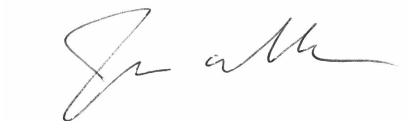

Jason Woodcock, Project Manager

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503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

PBS Engineering and Environmental	Project: SW Harvey Milk St	
4412 S Corbett Ave	Project Number: 15194.889	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3C0135 - 03 16 23 1202

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0392 - EPA 3051A							Soil					
Blank (23C0392-BLK1)		Prepared: 03/10/23 07:17	Analyzed: 03/10/23 16:02									
EPA 6020B												
Arsenic	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	---	0.200	mg/kg wet	10	---	---	---	---	---	---	
Chromium	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
Lead	ND	---	0.200	mg/kg wet	10	---	---	---	---	---	---	
Mercury	ND	---	0.0800	mg/kg wet	10	---	---	---	---	---	---	
Selenium	ND	---	1.00	mg/kg wet	10	---	---	---	---	---	---	
Silver	ND	---	0.200	mg/kg wet	10	---	---	---	---	---	---	
LCS (23C0392-BS1)		Prepared: 03/10/23 07:17	Analyzed: 03/10/23 16:18									
EPA 6020B												
Arsenic	46.8	---	1.00	mg/kg wet	10	50.0	---	94	80 - 120%	---	---	
Barium	49.4	---	1.00	mg/kg wet	10	50.0	---	99	80 - 120%	---	---	
Cadmium	47.5	---	0.200	mg/kg wet	10	50.0	---	95	80 - 120%	---	---	
Chromium	48.0	---	1.00	mg/kg wet	10	50.0	---	96	80 - 120%	---	---	
Lead	48.7	---	0.200	mg/kg wet	10	50.0	---	97	80 - 120%	---	---	
Mercury	0.927	---	0.0800	mg/kg wet	10	1.00	---	93	80 - 120%	---	---	
Selenium	23.3	---	1.00	mg/kg wet	10	25.0	---	93	80 - 120%	---	---	
Silver	23.8	---	0.200	mg/kg wet	10	25.0	---	95	80 - 120%	---	---	
Duplicate (23C0392-DUP1)		Prepared: 03/10/23 07:17	Analyzed: 03/10/23 16:29									
QC Source Sample: Drum Profile (A3C0135-04)												
EPA 6020B												
Arsenic	ND	---	1.28	mg/kg dry	10	---	0.869	---	---	***	20%	CONT
Barium	**81.7**	---	1.28	mg/kg dry	10	---	66.9	---	---	20	20%	CONT
Cadmium	ND	---	0.255	mg/kg dry	10	---	ND	---	---	---	20%	CONT
Chromium	**16.5**	---	1.28	mg/kg dry	10	---	13.8	---	---	18	20%	CONT
Lead	**3.91**	---	0.255	mg/kg dry	10	---	4.26	---	---	9	20%	CONT
Mercury	ND	---	0.102	mg/kg dry	10	---	ND	---	---	---	20%	CONT
Selenium	ND	---	1.28	mg/kg dry	10	---	ND	---	---	---	20%	CONT
Silver	ND	---	0.255	mg/kg dry	10	---	ND	---	---	---	20%	CONT
Matrix Spike (23C0392-MS1)		Prepared: 03/10/23 07:17	Analyzed: 03/10/23 16:34									

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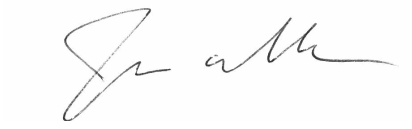

Jason Woodcock, Project Manager

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

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0392 - EPA 3051A							**Soil**					
Matrix Spike (23C0392-MS1)	Prepared: 03/10/23 07:17 Analyzed: 03/10/23 16:34											
QC Source Sample: Drum Profile (A3C0135-04)												
EPA 6020B												
Arsenic	61.4	---	1.26	mg/kg dry	10	62.8	0.869	96	75 - 125%	---	---	CONT
Barium	165	---	1.26	mg/kg dry	10	62.8	66.9	**156**	**75 - 125%**	---	---	CONT,Q-04
Cadmium	60.6	---	0.251	mg/kg dry	10	62.8	ND	96	75 - 125%	---	---	CONT
Chromium	79.9	---	1.26	mg/kg dry	10	62.8	13.8	105	75 - 125%	---	---	CONT
Lead	68.4	---	0.251	mg/kg dry	10	62.8	4.26	102	75 - 125%	---	---	CONT
Mercury	1.22	---	0.101	mg/kg dry	10	1.26	ND	97	75 - 125%	---	---	CONT
Selenium	29.1	---	1.26	mg/kg dry	10	31.4	ND	93	75 - 125%	---	---	CONT
Silver	30.7	---	0.251	mg/kg dry	10	31.4	ND	98	75 - 125%	---	---	CONT

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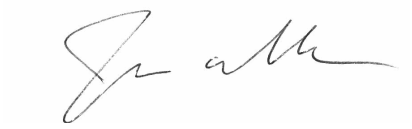

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Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23C0213 - Total Solids (Dry Weight)								Soil				
Duplicate (23C0213-DUP3)		Prepared: 03/06/23 12:51		Analyzed: 03/07/23 06:30								**CONT**
QC Source Sample: B7-12.5 (A3C0135-01)												
EPA 8000D												
% Solids	**73.6**	---	1.00	%	1	---	73.6	---	---	0.1	10%	

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

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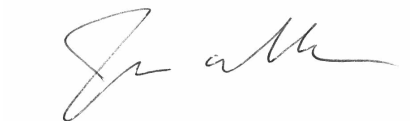

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ANALYTICAL REPORT

PBS Engineering and Environmental	Project: SW Harvey Milk St	
4412 S Corbett Ave	Project Number: 15194.889	Report ID:
Portland, OR 97239	Project Manager: Nick Thornton	A3C0135 - 03 16 23 1202

SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23C0512							
A3C0135-01	Soil	NWTPH-Dx	03/02/23 13:45	03/14/23 10:01	10.77g/5mL	10g/5mL	0.93
A3C0135-02	Soil	NWTPH-Dx	03/02/23 14:30	03/14/23 10:01	10.25g/5mL	10g/5mL	0.98
A3C0135-03	Soil	NWTPH-Dx	03/02/23 15:15	03/14/23 10:01	10.6g/5mL	10g/5mL	0.94

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23C0190							
A3C0135-01	Soil	NWTPH-Gx (MS)	03/02/23 13:45	03/02/23 13:45	10.22g/10mL	5g/5mL	0.98
A3C0135-02	Soil	NWTPH-Gx (MS)	03/02/23 14:30	03/02/23 14:30	10.07g/10mL	5g/5mL	0.99
A3C0135-03	Soil	NWTPH-Gx (MS)	03/02/23 15:15	03/02/23 15:15	11.05g/10mL	5g/5mL	0.91

Volatile Organic Compounds by EPA 8260D

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23C0190							
A3C0135-04	Soil	5035A/8260D	03/02/23 15:30	03/02/23 15:30	10.03g/10mL	5g/5mL	1.00

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23C0392							
A3C0135-04	Soil	EPA 6020B	03/02/23 15:30	03/10/23 07:17	0.459g/50mL	0.5g/50mL	1.09

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23C0213							
A3C0135-01	Soil	EPA 8000D	03/02/23 13:45	03/06/23 12:51			NA
A3C0135-02	Soil	EPA 8000D	03/02/23 14:30	03/06/23 12:51			NA
A3C0135-03	Soil	EPA 8000D	03/02/23 15:15	03/06/23 12:51			NA
A3C0135-04	Soil	EPA 8000D	03/02/23 15:30	03/06/23 12:51			NA

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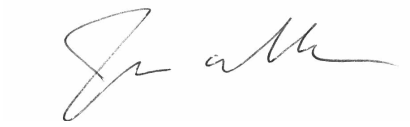

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ANALYTICAL REPORT

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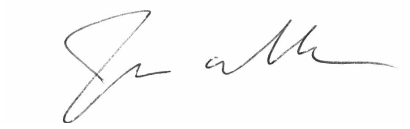
Portland, OR 97239	Project Manager: Nick Thornton	A3C0135 - 03 16 23 1202

SAMPLE PREPARATION INFORMATION

Percent Dry Weight

Apex Laboratories



Jason Woodcock, Project Manager

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ANALYTICAL REPORT

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

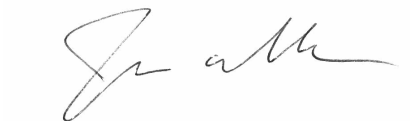
QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

CONT	The Sample Container provided for this analysis was not provided by Apex Laboratories, and has not been verified as part of the Quality System.
ICV-02	Estimated Result. Initial Calibration Verification (ICV) failed low.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-04	Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
Q-42	Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
Q-54	Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by -16%. The results are reported as Estimated Values.
Q-55	Daily CCV/LCS recovery for this analyte was below the +/-20% criteria listed in EPA 8260, however there is adequate sensitivity to ensure detection at the reporting level.

Apex Laboratories



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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported.

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

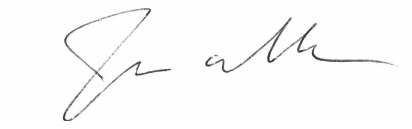
" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories



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503-718-2323
ORELAP ID: **OR100062**

PBS Engineering and Environmental	Project: **SW Harvey Milk St**	
4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

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ANALYTICAL REPORT

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Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation)
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

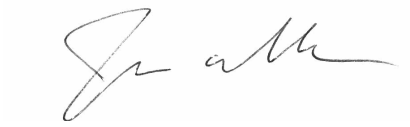
Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories



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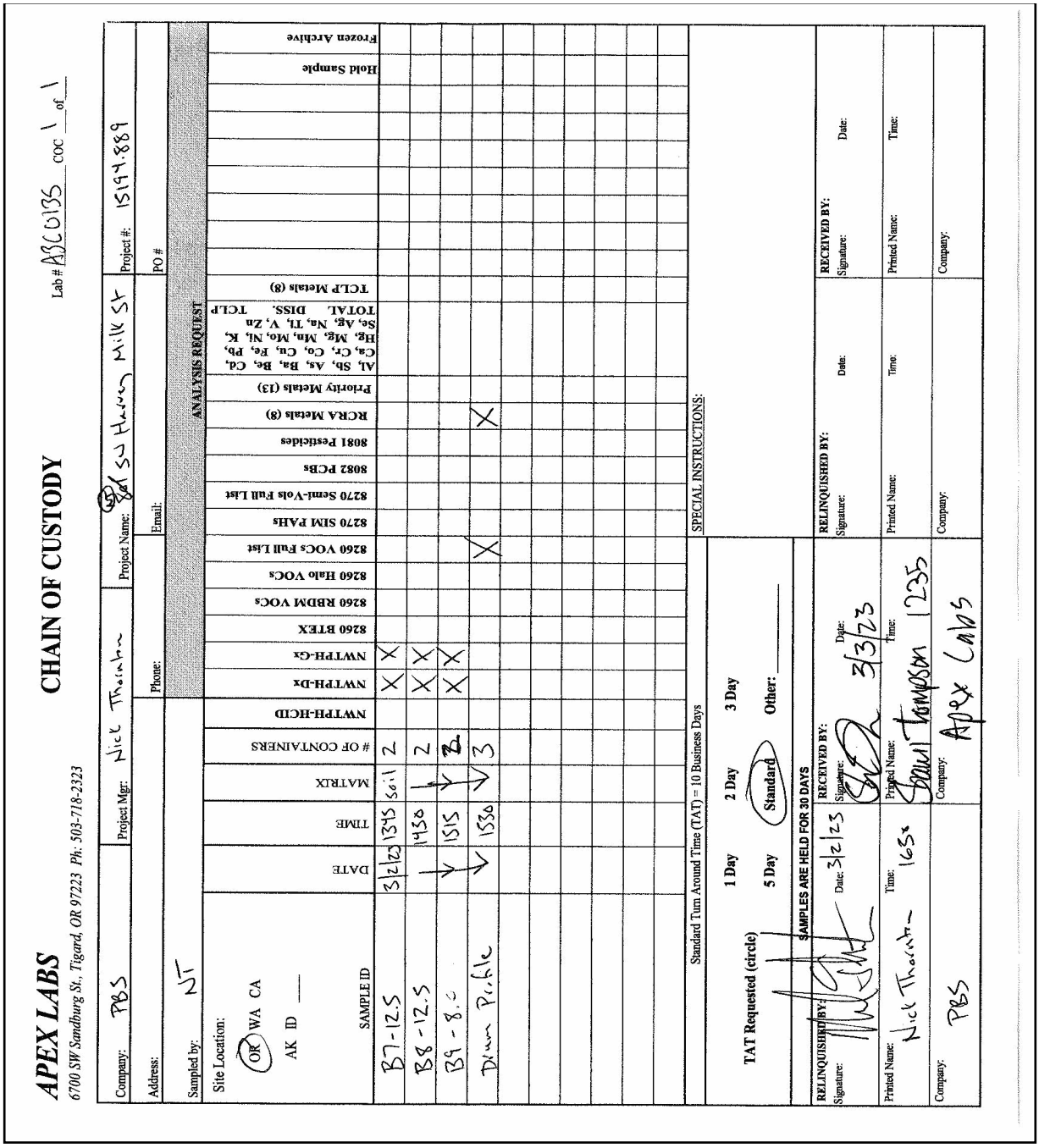

APEX LABS — **CHAIN OF CUSTODY** — Lab # A3C0135 COC 1 of 1

6700 SW Sandburg St, Tigard, OR 97223 Ph: 503-718-2323

Company: PBS | Project Mgr: Nick Thornton | Project Name: SW Harvey Milk St | Project #: 15194.889
Address: | Phone: | Email: | PO #
Sampled by: NT

Site Location: (OR) WA CA AK ID ____

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pesticides	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	Hold Sample	Frozen Archive
B7-12.5	3/2/23	1345	soil	2		X	X														
B8-12.5		1450		2		X	X														
B9-8.5		1515		2		X	X									X					
Dup Pickle		1530		3							X										

SPECIAL INSTRUCTIONS:

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day | 2 Day | 3 Day | 5 Day | Standard | Other: ____

SAMPLES ARE HELD FOR 30 DAYS

	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:				
Date:	Date: 3/2/23	Date: 3/3/23	Date:	Date:
Time:	Time: 1650	Time:	Time:	Time:
Printed Name:	Nick Thornton	Printed Name: Shawn Thompson 12235	Printed Name:	Printed Name:
Company:	Company: PBS	Company: Apex Labs	Company:	Company:

Apex Laboratories, LLC
6700 S.W. Sandburg Street
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4412 S Corbett Ave	Project Number: **15194.889**	**Report ID:**
Portland, OR 97239	Project Manager: **Nick Thornton**	**A3C0135 - 03 16 23 1202**

APEX LABS COOLER RECEIPT FORM

Client: PBS Engineering & Environmental Element WO#: A3C0135

Project/Project #: SW Harvey Milk St. 15194.889

Delivery Info:

Date/time received: 3/3/23 @ 12:35 By: SAT

Delivered by: Apex X Client ESS FedEx UPS Radio Morgan SDS Evergreen Other

Cooler Inspection Date/time inspected: 3/3/23 @ 15:05 By: AAW

Chain of Custody included? Yes X No

Signed/dated by client? Yes X No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	5.0						
Custody seals? (Y/N)	N						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	Y						
Ice type: (Gel/Real/Other)	Real						
Condition (In/Out):	In						

Cooler out of temp? (Y/N) Possible reason why:

Green dots applied to out of temperature samples? Yes/No

Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: 3/3/23 @ 15:06 By: AAW

All samples intact? Yes X No Comments:

Bottle labels/COCs agree? Yes X No Comments:

COC/container discrepancies form initiated? Yes No X

Containers/volumes received appropriate for analysis? Yes X No Comments:

Do VOA vials have visible headspace? Yes No NA X

Comments

Water samples: pH checked: Yes No NA X pH appropriate? Yes No NA X

Comments:

Additional information:

Labeled by: AAW Witness: DJS Cooler Inspected by: AAW

Form Y-003 R-00

Apex Laboratories

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Jason Woodcock, Project Manager