SOUNDTRANSIT

Federal Way Link Extension (F200)
Contract No. RTA/CN 0009-17

Soil Characterization and Remediation Report Parcel FL-232

July 15, 2020

Prepared by:

OSG | O'Neill Service Group

O'Neill Service Group, LLC
17619 NE 67th Ct, Suite 100
Redmond, WA 98052

Prepared for:

Kiewit

Kiewit Infrastructure West Co.
2200 Columbia House Blvd.
Vancouver, WA 98661

OSG O'Neill Service Group

July 15, 2020

Kiewit Infrastructure West Co.
2200 Columbia House Blvd.
Vancouver, WA 98661

Attention: Mr. Robert Brenner

Subject: Soil Characterization and Remediation Report
Parcel FL-232
Federal Way Link Extension Project
23646 Pacific Highway South
Kent, Washington

Dear Mr. Brenner:

Transmitted herewith is the Soil Characterization and Remediation Report for remedial actions associated with Parcel FL-232 located at 23646 30th Pacific Highway South in Kent, Washington as a part of the Sound Transit Federal Way Link Extension Contract within the cities of SeaTac, Des Moines, Kent, and Federal Way Washington. This report includes our field procedures and observations, analytical testing results, documentation of proper soil disposal and recommendations.

We trust the information presented in this report meets your needs. Should you require additional information or have questions regarding this report, please contact us at (425) 429-7800.

Sincerely,

State of Washington
Hydrogeologist
132
Licensed Geologist
VANCE ATKINS

Vance Atkins, LG, LHG
Project Manager

Scott Darst
Environmental Group Manager

Attachment: Soil Characterization and Remediation Report

Revision History

Revision Number	Revision Date	Description of Changes
00	6/3/20	Initial Submittal
00	7/15/20	Resubmittal per Reviewers Comments

Table of Contents

SOIL CHARACTERIZATION AND REMEDIATION REPORT SOUND TRANSIT PARCEL FL-232 23646 PACIFIC HIGHWAY SOUTH KENT, WASHINGTON

1.0 INTRODUCTION AND BACKGROUND

This report presents the findings of O'Neill Service Group's (OSG) soil characterization and remediation program conducted at Federal Way Link Extension Parcel Number FL-232 located at 23646 30th Avenue South in Kent, Washington. This report was prepared for Kiewit Infrastructure West Co. (Kiewit) in support of the Sound Transit Federal Way Link Extension (F200) project.

Lube oil-range petroleum hydrocarbons, and carcinogenic polyaromatic hydrocarbons (cPAHs) were previously identified during a Phase I and Phase II Environmental Site Assessment (ESA) (GeoEngineers, 2017a,b). OSG conducted a series of test pits to further assess the presence and extent of petroleum-impacted and cPAH-contaminated soils for delineation purposes. The test pit results confirmed the presence of a limited quantity of cPAH-contaminated soil in the vicinity of a former septic drain field. Subsequent excavations removed the contaminated soils. The contaminated soil was transported offsite for proper disposal.

This report presents the field activities and findings for two main features of work: 1) soil sampling for characterization of the former septic drain field and oil water separator, and 2) removal and disposal of cPAH-contaminated soils identified during the prior investigations.

1.1 SITE LOCATION

The F200 Parcel Number FL-232 is located at 23646 Pacific Highway South in Kent, Washington (Figures 1 and 2). The site is bounded on the west by Pacific Highway South, and was previously bounded on the north by apartments, and to the east and south by commercial properties. The parcels to the north, east, and south are also associated with the F200 project and undergoing redevelopment. The site elevation at the time of excavation was approximately 410 feet above project datum NAVD 1988.

1.2 SITE BACKGROUND

Details of historic property use, and the site assessments performed to date can be found in GeoEngineers, 2017a, b. The following is a summary of those assessments.

Based on GeoEngineers' report the property was developed in the 1940s originally by a restaurant. A used car dealership began operation at the property in the 1970s. These businesses were in operation at the time of the GeoEngineers assessment. The Site was most recently utilized by a restaurant in the north center of the parcel, with an office (car dealer) in the southeast corner, and the remainder was paved to be used for parking and vehicle storage. The restaurant utilized septic tanks and an on-site drain field prior to the 1970s before being connected to municipal sanitary sewer. The septic tanks were located in the center of the Site. A drain line identified in the Phase II ESA (near FL232-B4 and FL232-B5) was part of the drain field based on perforated piping observed in supplemental test pits. Additionally, an oil-water separator was located in the southeast of the Site adjacent north of the car dealer office building. Subsurface investigations by GeoEngineers identified carcinogenic polyaromatic hydrocarbons (cPAHs) above Washington Department of Ecology (Ecology) MTCA cleanup levels in shallow soils adjacent to the former septic drain line in the eastern portion of the Site (Boring FL232-B5). Lube oil-range petroleum hydrocarbons were also detected in soil samples from this boring and an adjacent boring (Boring FL232-B4), but at concentrations below MTCA cleanup levels. These detections were generally attributed to releases from the drain field or near-surface impacts. Phase II GeoEngineers' Figures and Tables are included in Appendix A.

2.0 SCOPE OF SERVICES

OSG prepared a Cleanup Action Plan (OSG, 2020) for supplemental characterization and remediation of contaminated soils. Based upon GeoEngineers' initial soil characterization results, OSG proposed additional soil characterization to further assess the extent and degree of cPAH contamination, as well as assess areas not previously sampled during the previous investigation. Based on the findings of the prior investigation and supplemental investigation, OSG also directed removing and properly disposing of cPAH-contaminated soil identified and delineated in the vicinity of the former drain field.

The overall field program included supplemental test pit characterization and delineation of the remedial area, observing and documenting the excavation activities, performing field screening, and the

collection of post-excavation soil samples for laboratory analysis and documentation of soil disposal activities. Analytical results from supplemental investigation and post-excavation soil samples were compared to the Ecology's MTCA Method A soil cleanup levels for Unrestricted Land Use to assess if additional soil removal activities were warranted.

The following scope of services was conducted:

- OSG oversee potholing for soil screening and analytical testing during the supplemental soil characterization and excavation activities;
- Completed delineation sampling in the vicinity of GeoEngineers boring FL232- B5 along the east side of the parcel;
- Completed characterization sampling adjacent to an on-site oil water separator and septic drainfield in the southeastern portion of the parcel;
- Completed excavation and confirmation in the vicinity of GeoEngineers borings FL232-B4 and B5. Collected two post-excavation confirmation samples to supplement prior supplemental characterization samples;
- Submitted soil samples to a Washington Department of Ecology-accredited laboratory to be analyzed for the presence of diesel and heavy oil-range petroleum hydrocarbons by Method NWTPH-Dx and cPAHs by EPA Method 8270SIM;
- Coordinated and documented the excavation, transportation, and disposal of a limited volume of petroleum-impacted and cPAH-contaminated soil to the Republic Services facility in Seattle, WA; and
- Preparation of this Report to summarize the characterization and remedial soil removal activities, soil sample analytical results, and conclusions and recommendations for potential future activities.

3.0 SUPPLEMENTAL CHARACTERIZATION

3.1 SOIL CHARACTERIZATION

On March 2, 2020, an OSG environmental scientist was on-site to observe and document test pits completed in the vicinity of GeoEngineers borings FL232-B4 and B5 and the oil/water separator (Shown on Figure 2). KLB Construction (KLB), Kiewit's earthwork subcontractor, provided a track-mounted excavator to complete test pits at selected locations on the parcel.

A total of four test pits (PH232-2 through PH232-5) were completed around the boring locations, and one test pit (PH232-1) was completed adjacent to the oil-water separator in the southeast quadrant of the site. Test pits were completed to five feet below ground surface (bgs). Soils typically consisted of sandy fill soils, although silty sands with slight oxidation were observed in the base of some test pits. Septic drain field piping (black, slotted ABS piping) was observed at depths of approximately three feet bgs. Groundwater was not encountered. Site photographs are included in Appendix B.

On April 22, 2020, OSG completed three additional test pits (PH232-6 through PH232-8) in the vicinity of a second former septic drain field in the southeastern portion of the parcel. The area had not been previously sampled due to the presence of a building at that location. A total of three test pits were completed at the drain field. Test pits were completed to five feet bgs. Soils typically consisted of sandy fill soils. Septic drain field piping (black slotted ABS piping) was observed at depths of approximately three feet bgs. Groundwater was not encountered during sampling.

Soil samples were collected from each test pit and field screened for the presence of petroleum hydrocarbons with a photoionization detector (PID). The sample locations were marked with stakes for later surveying. The depths of all soil samples collected from the test pits are shown on Table 1.

Soil samples were placed in individual laboratory-supplied uncontaminated glass jars. Sample labels were fixed to all sample jars and contained the following information: sample number, project name, date and time of collection, and sampler's initials. Sealed samples were stored in a chilled cooler and were maintained in a cooled condition until delivery to the analytical laboratory.

3.2 PRELIMINARY SOIL SAMPLE RESULTS

Sixteen soil samples were submitted to Fremont Analytical, an Ecology-accredited analytical laboratory, located in Seattle, Washington. Soil samples in the drain field vicinity were analyzed for diesel and heavy oil range petroleum hydrocarbons using Washington State Department of Ecology Method NWTPH-Dx and cPAHs by EPA Method 8270SIM. The test pit samples adjacent to the oil water separator were tested for hydrocarbon identification using Ecology Method NWTPH-HCID. Petroleum hydrocarbons were not detected in the two samples (PH232-1-1, PH232-1-3, Table 1), therefore follow-up quantification sampling was not conducted. Complete Chain-of-Custody records were transferred with the samples to the analytical laboratory. A copy of the completed Chain-of-Custody documentation is presented in Appendix C.

Test pit samples surrounding soil borings FL232-B4 and FL232-B5 were analyzed for cPAHs based on prior detections and exceedances of specific analytes. Analytical results indicated cPAH concentrations in test pit sample PH232-3-3, below the MTCA Method A Cleanup Level of 0.1 mg/kg. cPAHs were not detected in the remaining samples. Heavy oil-range petroleum hydrocarbons were detected in test pit sample PH232-7-3 in the southeastern portion of the parcel, below the MTCA Method A Cleanup Level of 2,000 mg/kg. cPAHs were not detected in any of the south test pits. A summary of the test pit soil sample results is presented in Table 1. Test pit soil sampling locations are depicted on Figure 2. Copies of Laboratory Analytical Reports are presented in Appendix C.

Based on field observations and screening during the preliminary sampling, and the supplemental sampling, OSG proposed removal of previously identified soils containing cPAHs in exceedance of MTCA cleanup levels in the vicinity of boring FL232-B5 (Figure 2). OSG did not recommend other remedial excavations.

4.0 REMEDIAL EXCAVATION

4.1 SOIL EXCAVATION FIELD PROCEDURES

The purpose of the soil excavation activities was to remove cPAH-contaminated soils identified in the vicinity of the former septic drain field and boring FL232-B5. The remedial excavation took place on April 22, 2020.

Excavation was performed by KLB using a track-mounted excavator. Excavated soil was loaded directly into truck and trailers for transport to Republic Services, the approved disposal facility. The excavation was approximately rectangular oriented north-south and was approximately 20 feet long and 16 feet wide. The average depth of the excavation was 6 feet bgs. The extent of the excavated soils is shown on Figure 3.

Post excavation soil samples were collected at the limits of excavation. Two post-excavation samples (232 PEX-1-3 and 232 PEX-2-5) were collected from the east sidewall and excavation base, respectively. The sample locations were marked with stakes for surveying. Additionally, characterization samples collected from test pits PH232-3, PH232-4, and PH232-5 were used as representative confirmation samples for the south, west, and north sidewalls, respectively. A summary of the post-excavation soil sample results is presented in Table 1. Post-excavation soil sampling locations are depicted on Figure 2.

After remediation and sampling was completed, Kiewit surveyed the excavation extent and sample locations. The locations of the post-excavation soil samples and cross-sectional profiles of the excavation are shown on Figure 3. Site photographs are included in Appendix B.

Post-excavation soil samples were placed in individual laboratory-supplied uncontaminated glass jars. Sample labels were fixed to all sample jars and contained the following information: sample number, project name, date and time of collection, and sampler's initials. Sealed samples were stored in a chilled cooler and were maintained in a cooled condition until delivery to the analytical laboratory.

4.2 POST-EXCAVATION SOIL SAMPLE RESULTS

Soil samples were submitted to Fremont Analytical for analytical testing. Soil samples were analyzed for diesel and heavy oil range petroleum hydrocarbons using Washington State Department of Ecology Method NWTPH-Dx and cPAHs by EPA Method 8270SIM. Complete Chain-of-Custody records were transferred with the samples to the analytical laboratory. A copy of the completed Chain-of-Custody documentation is presented in Appendix C.

Post-excavation soil sampling analytical results indicated petroleum hydrocarbons were either not detected at concentrations greater than laboratory reporting limits or were below the MTCA Method A Cleanup Level of 2,000 mg/kg. cPAHs were not detected at concentrations greater than laboratory

reporting limits. A summary of the post-excavation soil sample analytical testing results is shown on Table 1.

5.0 SOIL DISPOSAL

On April 22, 2020, a total of 62.4 tons of cPAH-contaminated soil was transported offsite for proper disposal at the Republic Services transfer station in Seattle, Washington. The contaminated soil was transported by KLB in accordance with applicable local, state and federal regulations. A copy of the Disposal Weight Tickets is presented in Appendix D.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on prior Phase I and Phase II ESAs performed at Parcel FL232 of the Sound Transit FWLE (F200), cPAH-contaminated and petroleum-impacted soils were identified in the vicinity of a former septic drain field. Supplemental characterization performed by OSG partially delineated the area of cPAH-contaminated soils associated with the drain field. The characterization did not identify contaminated soil near the oil water separator or in the southern portion of the drain field.

Based on the field observations and analytical testing results, a total of approximately 62.4 tons of cPAH-contaminated soil was removed from the remedial excavation area. The soil was transported to the Republic Services disposal facility in Seattle, Washington. All excavated contaminated soil was transported to the disposal facility by KLB in accordance with applicable local, state, and federal regulations.

A series of post-excavation soil samples were collected from the excavation for analytical testing. Analytical results either did not detect petroleum or cPAH concentrations at laboratory reporting limits or detected concentrations were below their respective MTCA Method A Cleanup Level.

Based on the analytical testing results performed at FL232, no additional remediation activities are recommended at this time.

7.0 LIMITATIONS

This Soil Characterization and Remediation Report was performed in general accordance with the approved Cleanup Action Plan and applicable regulations and guidelines referenced therein. This work was not designed to identify all potential concerns or to eliminate all risk associated with the subject property. Even the most rigorous of professional assessments may fail to identify all existing conditions. This work will not provide a guarantee regarding site contamination and may not generate sufficient data to accurately define the lateral and vertical extent of contamination. This work does not include other services not specifically described in the scope of services presented above.

Property activities and regulations beyond OSG's control could change at any time after the completion of our Scope of Services. Therefore, OSG observations, findings, and opinions can be considered valid only as of the date of this Report and at the locations where samples were collected and tested.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on- and off-site), or other factors may change over time, and additional work may be required. Based on the intended use of the report, OSG may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else, unless specifically agreed to in advance by OSG in writing, releases OSG from any liability resulting from the use of this report by any unauthorized party.

No warranty, expressed or implied, is made.

8.0 REFERENCES

GeoEngineers, Inc., 2017a, AE 0044-12 WP 3.S, *Phase I Environmental Site Assessment, Parcel FL-232, Tax Parcel 2500600520*. Prepared for Sound Transit, March, 2017.

GeoEngineers, Inc., 2017b, *Phase II Environmental Site Assessment, Parcel -FL-232, Tax Parcel 2500600520*. Prepared for Sound Transit, September 11, 2017.

O'Neill Service Group, 2020, *Cleanup Action Plan, Parcel FL-232, Federal Way Link Extension Project, 23646 Pacific Highway South, Kent, Washington*, Prepared for Kiewit Infrastructure West, March 18, 2020.

Table 1 - Soil Sample Analytical Results

Soil Sample Analytical Results
Supplemental Characterization and Remediation
F200 Parcel FL232
23646 Pacific Highway South
Kent, Washington

Lab Report ID	Date	Sample ID	Sample Depth (ft bgs)	PID	Confirmation Sample?	NWTPH-HCID	NWTPH-Dx		PAHs (mg/kg)										
							Diesel	Heavy Oil	Phenanthrene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Total cPAH (TEF)[1]
2003007	3/2/20	**PH232-1-1**	1	0	N	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2003007	3/2/20	**PH232-1-3**	3	0	N	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2003007	3/2/20	**PH232-2-3**	3	0	N	NA	NA	NA	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399
2003007	3/2/20	**PH232-2-5**	5	0	N	NA	NA	NA	< 0.0449	<0.0449	<0.0449	<0.0449	<0.0449	<0.0449	<0.0449	<0.0449	<0.0449	<0.0449	<0.0449
2003007	3/2/20	**PH232-3-3**	3	0	Y-S	NA	NA	NA	**0.0485**	**0.075**	**0.712**	**0.0408**	< 0.0374	< 0.0374	< 0.0374	**0.0415**	< 0.0374	< 0.0374	**0.04558**
2003007	3/2/20	**PH232-3-5**	5	0	Y-B	NA	NA	NA	< 0.0420	< 0.0420	< 0.0420	< 0.0420	< 0.0420	< 0.0420	< 0.0420	< 0.0420	< 0.0420	< 0.0420	< 0.0420
2003007	3/2/20	**PH232-4-3**	3	0	Y-S	NA	NA	NA	< 0.0445	< 0.0447	< 0.0448	< 0.0449	< 0.0450	< 0.0451	< 0.0452	< 0.0453	< 0.0454	< 0.0455	< 0.0455
2003007	3/2/20	**PH232-4-5**	5	0	Y-B	NA	NA	NA	< 0.0400	< 0.0400	< 0.0400	< 0.0400	< 0.0400	< 0.0400	< 0.0400	< 0.0400	< 0.0400	< 0.0400	< 0.0400
2003007	3/2/20	**PH232-5-3**	3	0	Y-S	NA	NA	NA	< 0.0429	< 0.0429	< 0.0429	< 0.0429	< 0.0429	< 0.0429	< 0.0429	< 0.0429	< 0.0429	< 0.0429	< 0.0429
2003007	3/2/20	**PH232-5-5**	5	0	Y-B	NA	NA	NA	< 0.0434	< 0.0434	< 0.0434	< 0.0434	< 0.0434	< 0.0434	< 0.0434	< 0.0434	< 0.0434	< 0.0434	< 0.0434
2004260	4/22/20	**PH232-6-3**	3	0	N	NA	< 21.3	< 53.3	NA	NA	NA	< 0.0428	< 0.0428	< 0.0428	< 0.0428	< 0.0428	< 0.0428	< 0.0428	< 0.0428
2004260	4/22/20	**PH232-6-5**	5	0	N	NA	< 18.8	< 47.1	NA	NA	NA	< 0.0388	< 0.0388	< 0.0388	< 0.0388	< 0.0388	< 0.0388	< 0.0388	< 0.0388
2004260	4/22/20	**PH232-7-3**	3	0	N	NA	< 20.8	**75.4**	NA	NA	NA	< 0.0385	< 0.0385	< 0.0385	< 0.0385	< 0.0385	< 0.0385	< 0.0385	< 0.0385
2004260	4/22/20	**PH232-7-5**	5	0	N	NA	< 22.4	< 56.0	NA	NA	NA	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452
2004260	4/22/20	**PH232-8-3**	3	0	N	NA	< 20.7	< 51.8	NA	NA	NA	< 0.0387	< 0.0387	< 0.0387	< 0.0387	< 0.0387	< 0.0387	< 0.0387	< 0.0387
2004260	4/22/20	**PH232-8-5**	5	0	N	NA	< 20.4	< 50.9	NA	NA	NA	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399	< 0.0399
2004260	4/22/20	**232PEX-1-3**	3	0	Y-S	NA	< 22.3	< 55.8	NA	NA	NA	< 0.0447	< 0.0374	< 0.0374	< 0.0374	< 0.0374	< 0.0374	< 0.0374	< 0.0374
2004260	4/22/20	**232-PEX-2-5**	5	0	Y-B	NA	< 21.1	**62.2**	NA	NA	NA	< 0.0435	< 0.0435	< 0.0435	< 0.0435	< 0.0435	< 0.0435	< 0.0435	< 0.0435
MTCA Method A or B Soil Cleanup Level for Unrestricted Land Use (Ecology, 2013)						various	2000	2000	NE	3200 (B)	2400 (B)	0.1 (TEF)	0.1 (TEF)	0.1 (TEF)	0.1 (TEF)	0.1 (TEF)	0.1 (TEF)	0.136 (B)	0.1 (TEF)

Notes:
ft bgs - Feet Below Ground Surface
mg/kg - milligrams per kilogram
PH - Supplemental investigation sample; PEX - Post-excavation confirmation sample
Confirmation samples document that soil remaining in place meets MTCA cleanup levels: N - Not Used; Y-S - Excavation Sidewall; Y-B - Base of Excavation
< - Not detected at listed laboratory reporting limit
Bold - Analyte detected
Bold/Highlighted - Analyte exceeds MTCA Method A or B Cleanup Level
NA - Not analyzed
NE - Cleanup level Not Established
Detected analytes reported. See laboratory report for complete list of analytes.
1 - Total Carcinogenic PAHs calculated based on Toxic Equivalency Factors (MTCA Table 708-2)

Figure 1 - Vicinity Map

6/4/2020 3:22 PM

Not to Scale

Reference: Base file Vicinity Map by GeoEngineers, dated 7-18-17.

O'Neill Service Group

FEDERAL WAY LINK EXTENSION
SEATAC AND FEDERAL WAY
KING COUNTY, WASHINGTON

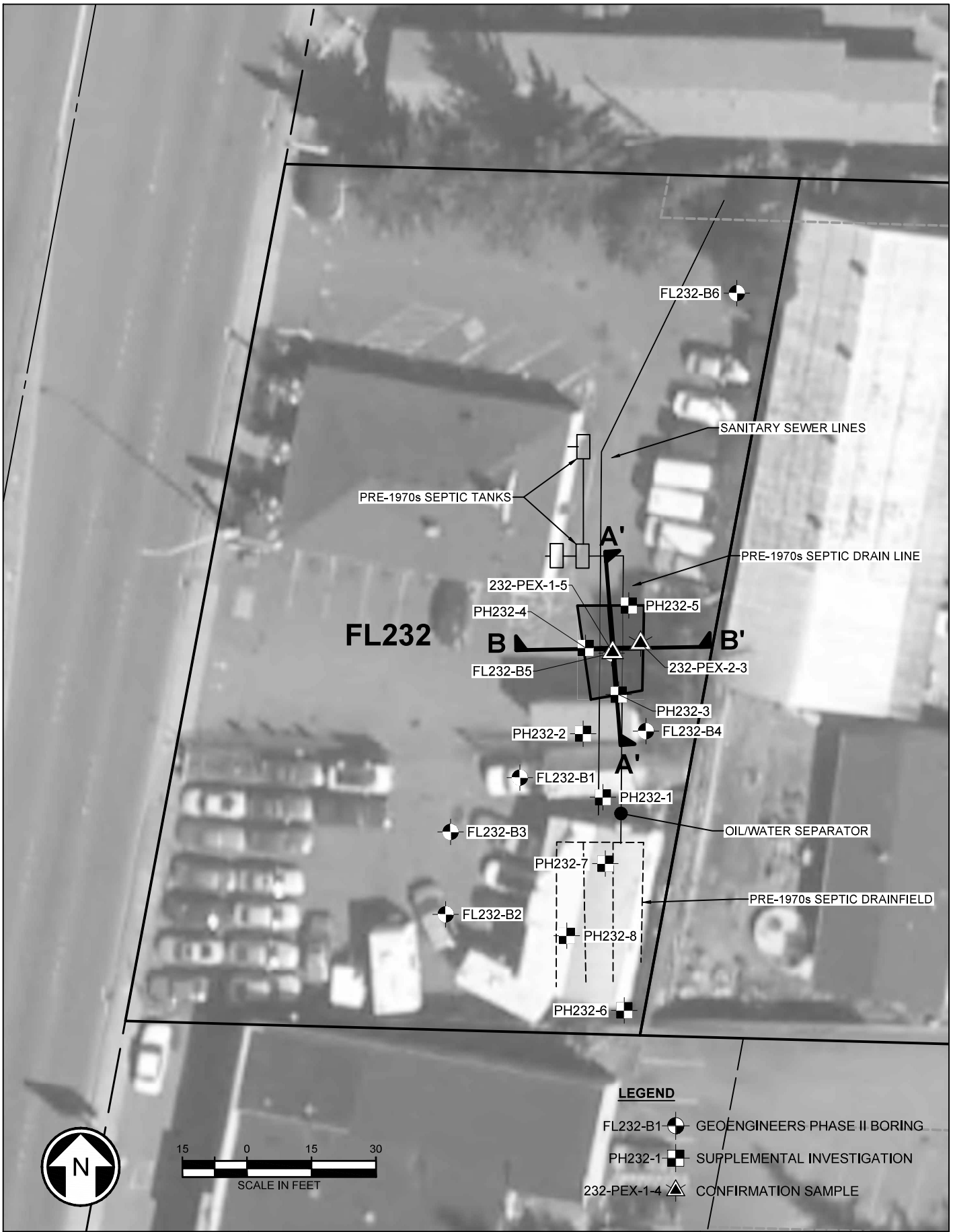
VICINITY MAP

Drawn By:	J. Stewart
Reviewed By:	V. Atkins
Approved By:	V. Atkins
Date:	June 2020
Project No.:	2021

FIGURE 1

Z:\Shared\CADD\2021_Kiewit Federal Way\Phase II ESA\FL-232\2021_Phase II_FL-232.dwg

Figure 2 - Soil Remediation Map



7/12/2020 3:32 PM

Z:\Shared\CADD\2021_Kiewit Federal Way\Phase II ESA\FWLE_Proposed Soil Excavation Areas.dwg

O'Neill Service Group

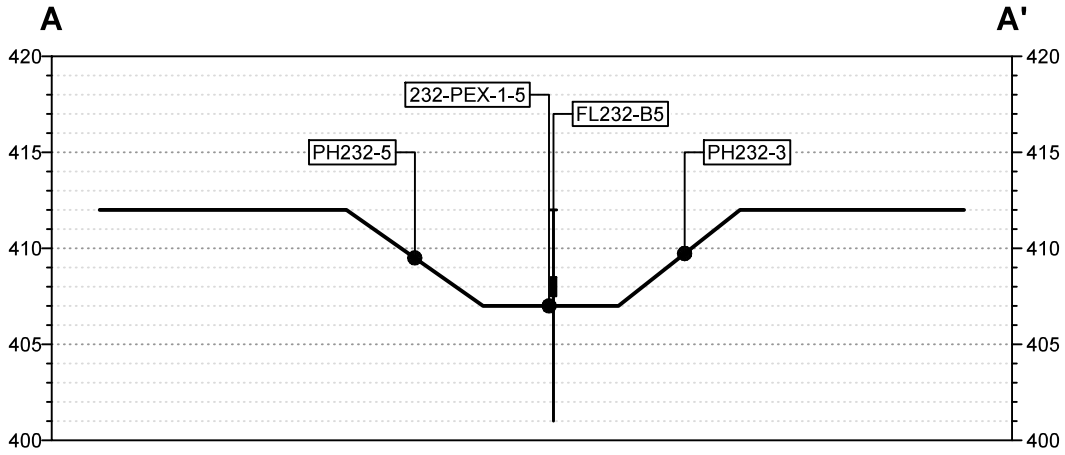
FEDERAL WAY LINK EXTENSION
SEATAC AND FEDERAL WAY
KING COUNTY, WASHINGTON

FL232 SOIL REMEDIATION

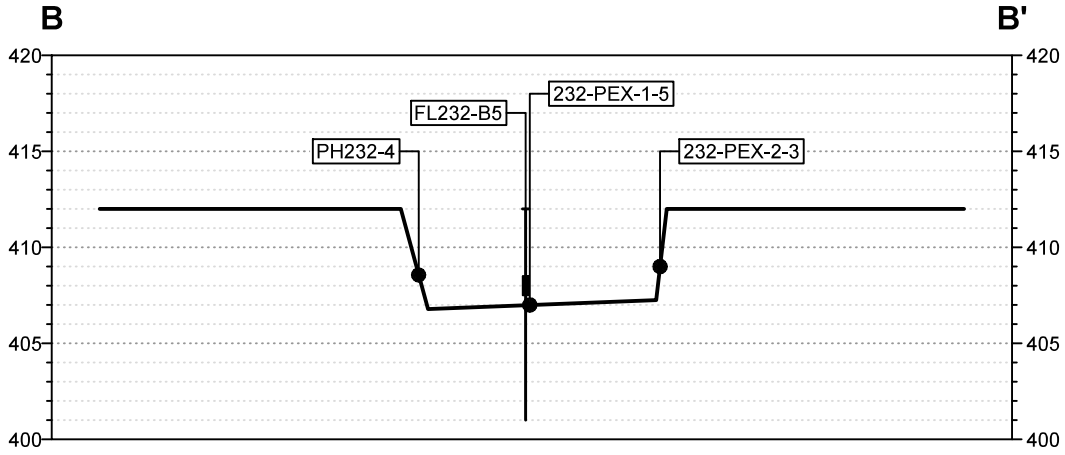
Drawn By:	J. Stewart
Reviewed By:	V. Atkins
Approved By:	S. Darst
Date:	June 2020
Project No.:	2021

FIGURE 2

Figure 3 - Excavation Cross Sections



FL232 CROSS SECTION A-A'



FL232 CROSS SECTION B-B'

LEGEND

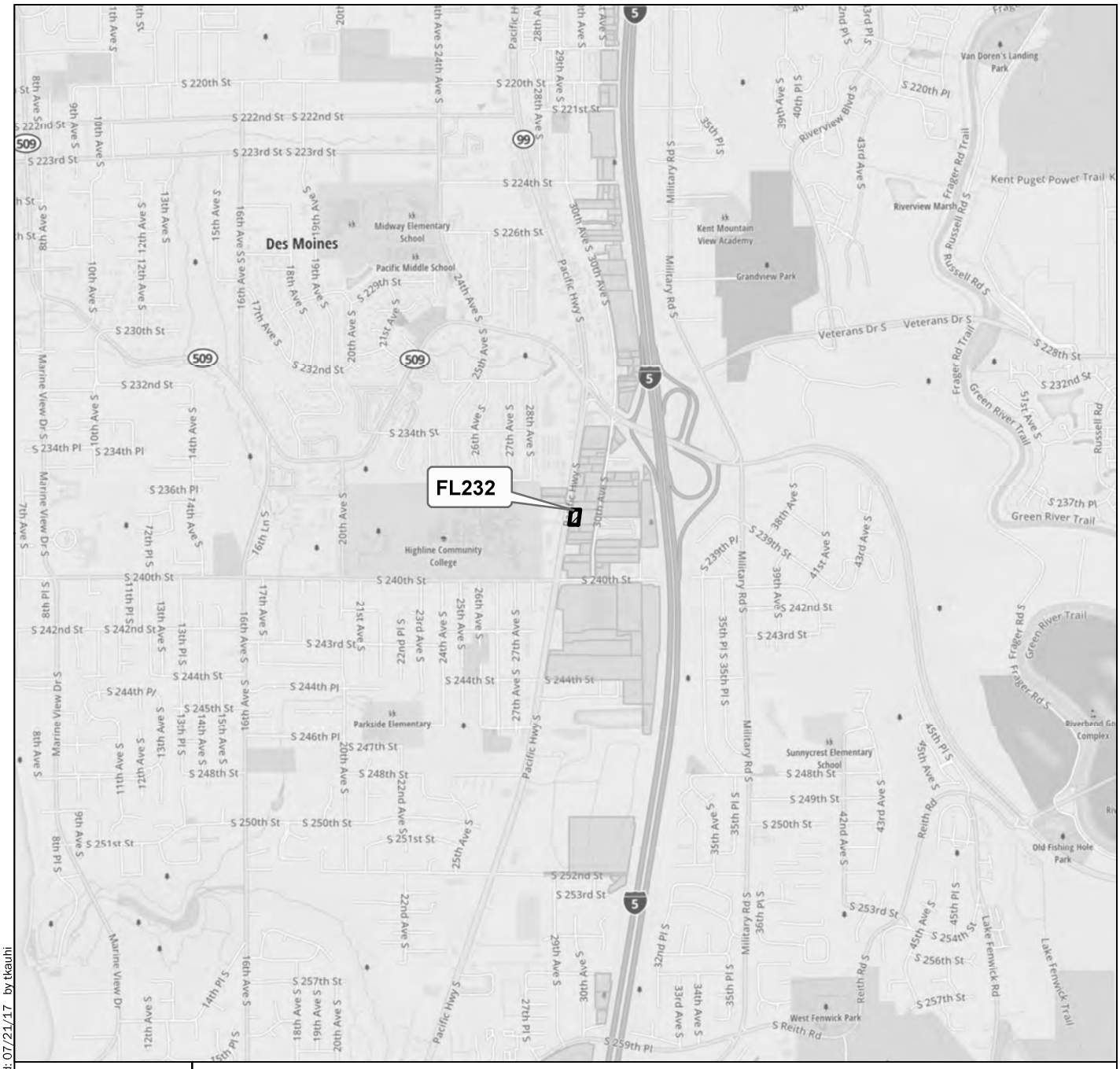
PH232-5 — SOIL BORING LOCATION AND ID WITH SAMPLE DEPTH EXCEEDING MTCA CLEANUP LEVELS (REMEDIATED)

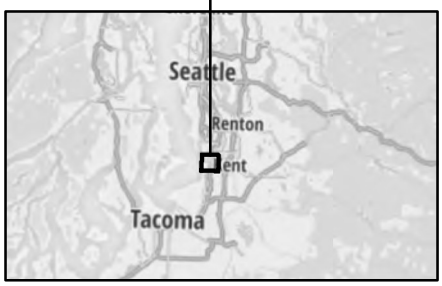
PH232-5 — POST-EXCAVATION SOIL SAMPLE LOCATION AND ID WITH DEPTH/ELEVATION

O'Neill Service Group	FEDERAL WAY LINK EXTENSION SEATAC AND FEDERAL WAY KING COUNTY, WASHINGTON	Drawn By: J. Stewart Reviewed By: V. Atkins Approved By: S. Darst Date: June 2020 Project No.: 2021	FIGURE 3
	FL232 CROSS SECTIONS		

APPENDIX A

Phase II GeoEngineers' Tables and Figures





Legend

- Subject Property
- Project Parcel

N
W E
S

2,000 0 2,000

Feet

Vicinity Map

Phase II Environmental Site Assessment
Federal Way Link Extension
Washington

GeoEngineers

Figure 1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2017

Projection: NAD 1983 UTM Zone 10N

P:\4\4082039\GIS\MXD\4082039001_F01_VicinityMap_FL232.mxd Date Exported: 07/21/17 by tkauhi

Legend

GeoEngineers Exploration — Current Sewer Line — Subject Property — Temporary Construction Easement

Site Feature — Historic Sewer Line — Fee Take

Notes:

1. Based on current design information for the FWLE project (HDR, provided in June 2017)
2. The locations of all features shown are approximate. 3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial and road names from King County 2015.

Parcel #: 2500600520
Address: 23646 PACIFIC HWY S
City: Kent
Owner: GADINI, LOUIS A.
Current Use: Restaurant/Lounge

N
W E
S

30 0 30
Feet

Site Plan - FL-232

Federal Way Link Extension
Washington

GeoEngineers

Figure 2

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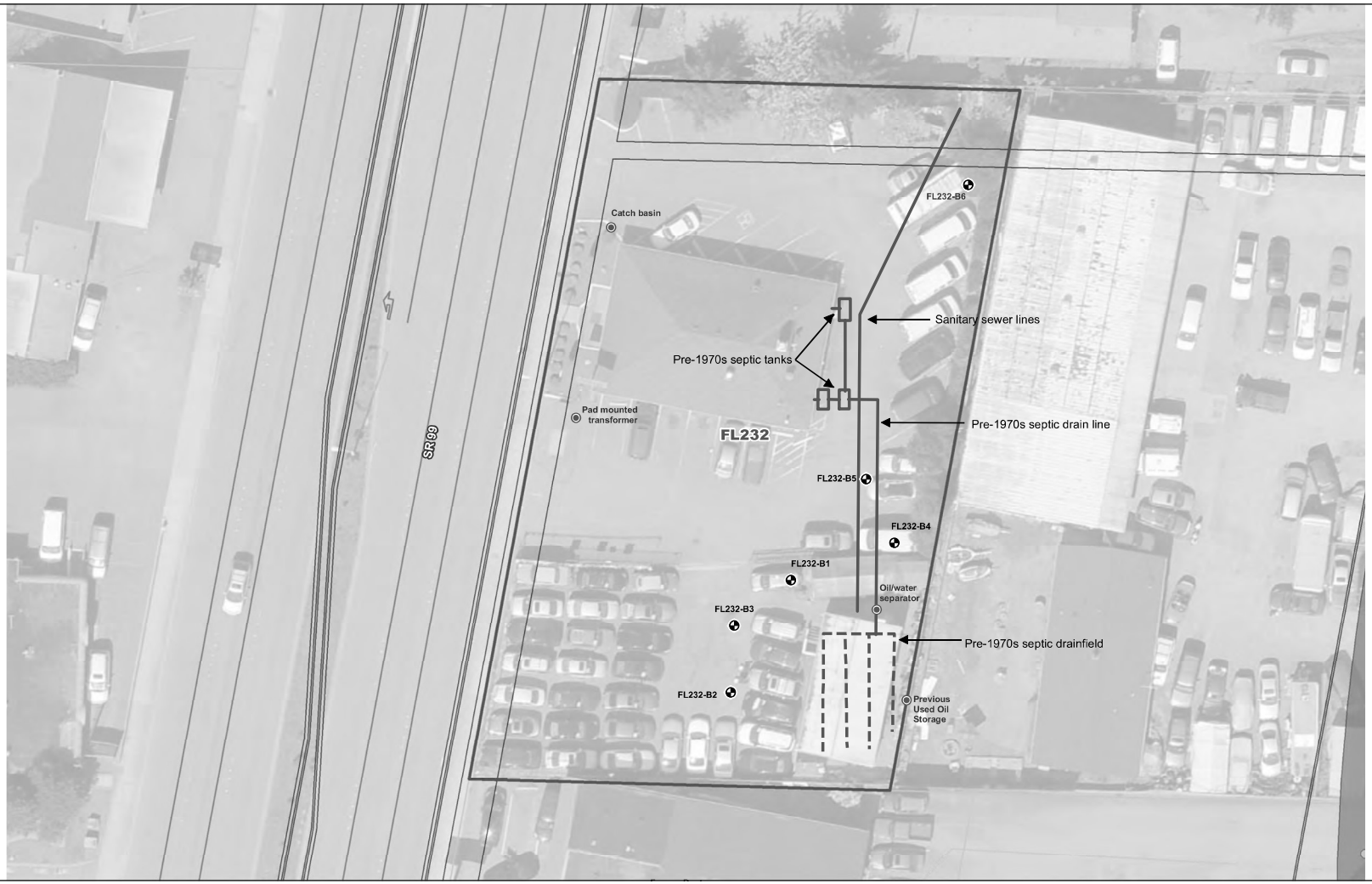

Legend

GeoEngineers Exploration
Site Feature
Current Sewer Line
Historic Sewer Line
Subject Property
Parcel

Planned Construction Features

Column
Road/Parking/Sidewalk
Station (line)
Utilities
Striping (Pavement Markings)
Structure

N
W E
S

30 0 30
Feet

Proposed Construction Plan - FL232

Phase II ESA
Federal Way Link Extension
Washington

GeoEngineers

Figure 3

Notes:

1. Based on current design information for the FWLE project (HDR, provided in June 2017)
2. The locations of all features shown are approximate. 3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial and road names from King County 2015.

Parcel #: 2500600520
Address: 23646 PACIFIC HWY S
City: Kent
Owner: GADINI, LOUIS A.
Current Use: Restaurant/Lounge

P:\4\40820389\GIS\MXD\408203901_F03_ConstructionPlanPhase2_FL232.mxd Date Exported: 09/06/17 by cchelf

Table 1

Summary of Soil Chemical Analytical Results[1]
Sound Transit - Federal Way Link Extension FL232
Kent, Washington

Boring Identification	FL232-B1		FL232-B2	FL232-B3	FL232-B4	FL232-B5		FL232-B6		MTCA Method A/B Cleanup Level[10]	Naturally Occurring Background Metals in Puget Sound Soils[14]
Sample Identification[2]	**FL232-B1-3.5-4.5**	**FL232-B1-7.5-8.5**	**FL232-B2-3.5-4.5**	**FL232-B3-6.5-7.5**	**FL232-B4-3.5-4.5**	**FL232-B5-3.5-4.5**	**FL232-B5-7-8**	**FL232-B6-3.5-4.5**	**FL232-B6-11.5-12.5**		
Sample Date	**5/24/2017**	**5/24/2017**	**5/24/2017**	**5/24/2017**	**5/24/2017**	**5/24/2017**	**5/24/2017**	**5/24/2017**	**5/24/2017**		
Sample Start Depth (feet bgs)	**3.5**	**7.5**	**3.5**	**6.5**	**3.5**	**3.5**	**7.0**	**3.5**	**11.5**		
Sample End Depth (feet bgs)	**4.5**	**8.5**	**4.5**	**7.5**	**4.5**	**4.5**	**8.0**	**4.5**	**12.5**		
NWTPH-HCID[3] (mg/kg)											
Gasoline-range hydrocarbons	–	22 U	–	22 U	22 U	22 U	–	–	22 U	30/100[11]	N/A
Diesel-range hydrocarbons	–	55 U	–	56 U	54 U	130 U	–	–	54 U	2,000	
Lube Oil-range hydrocarbons	–	110 U	–	110 U	**Detected**	**Detected**	–	–	110 U	2,000	
NWTPH-Dx[4] (mg/kg)											
Diesel-range hydrocarbons	–	–	–	–	–	140 U	28 U	–	–	2,000	N/A
Lube Oil-range hydrocarbons	–	–	–	–	**390 Est**	**1,400**	**190**	–	–	2,000	
Metals[5] (mg/kg)											
Arsenic	11 U	–	11 U	11 U	–	11 U	–	11 U	–	20	7
Barium	–	–	–	**59**	–	**66**	–	–	–	16,000	NE
Cadmium	–	–	–	0.56 U	–	0.55 U	–	–	–	2	1
Chromium	–	–	–	**25**	–	**33**	–	–	–	2,000[12]	48
Chromium, Hexavalent	–	–	–	1.1 U	–	–	–	–	–	19	NE
Lead	**38**	–	5.7 U	5.6 U	–	**36**	–	**66**	–	250	24
Mercury	–	–	–	0.28 U	–	0.28 U	–	–	–	2	0.07
Selenium	–	–	–	11 U	–	11 U	–	–	–	400	NE
Silver	–	–	–	1.1 U	–	1.1 U	–	–	–	400	NE
VOCs[6] (mg/kg)											
1,1,1,2-Tetrachloroethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	38.5	N/A
1,1,1-Trichloroethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	2	
1,1,2,2-Tetrachloroethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	5	
1,1,2-Trichloroethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	17.5	
1,1-Dichloroethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	175	
1,1-Dichloroethene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	4,000	
1,1-Dichloropropene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	NE	
1,2,3-Trichlorobenzene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	NE	
1,2,3-Trichloropropane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	0.0333	
1,2,4-Trichlorobenzene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	34.5	
1,2,4-Trimethylbenzene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	NE	
1,2-Dibromo-3-Chloropropane	–	–	–	0.0045 U	–	0.0047 U	–	–	–	1.25	
1,2-Dibromoethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	0.005	
1,2-Dichlorobenzene (o-Dichlorobenzene)	–	–	–	0.0012 U	–	0.00094 U	–	–	–	7,200	
1,2-Dichloroethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	11	
1,2-Dichloropropane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	27.8	
1,3,5-Trimethylbenzene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	800	
1,3-Dichlorobenzene (m-Dichlorobenzene)	–	–	–	0.0012 U	–	0.00094 U	–	–	–	NE	
1,3-Dichloropropane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	NE	
1,4-Dichlorobenzene (p-Dichlorobenzene)	–	–	–	0.0012 U	–	0.00094 U	–	–	–	185	
2,2-Dichloropropane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	NE	
2-Butanone (MEK)	–	–	–	0.0045 U	–	0.0047 U	–	–	–	48,000	

Boring Identification	FL232-B1		FL232-B2	FL232-B3	FL232-B4	FL232-B5		FL232-B6		MTCA Method A/B Cleanup Level[10]	Naturally Occurring Background Metals in Puget Sound Soils[14]
Sample Identification[2]	FL232-B1-3.5-4.5	FL232-B1-7.5-8.5	FL232-B2-3.5-4.5	FL232-B3-6.5-7.5	FL232-B4-3.5-4.5	FL232-B5-3.5-4.5	FL232-B5-7-8	FL232-B6-3.5-4.5	FL232-B6-11.5-12.5		
Sample Date	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017		
Sample Start Depth (feet bgs)	3.5	7.5	3.5	6.5	3.5	3.5	7.0	3.5	11.5		
Sample End Depth (feet bgs)	4.5	8.5	4.5	7.5	4.5	4.5	8.0	4.5	12.5		
2-Chloroethyl vinyl ether	–	–	–	0.0045 U	–	0.0073 U	–	–	–	NE	
2-Chlorotoluene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	1,600	
2-Hexanone	–	–	–	0.0045 U	–	0.0047 U	–	–	–	NE	
4-Chlorotoluene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	NE	
4-Methyl-2-Pentanone (Methyl isobutyl ketone)	–	–	–	0.0045 U	–	0.0047 U	–	–	–	6,400	
Acetone	–	–	–	0.0045 U	–	0.0094 U	–	–	–	72,000	
Benzene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	0.03	
Bromobenzene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	NE	
Bromochloromethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	NE	
Bromodichloromethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	16.1	
Bromoform (Tribromomethane)	–	–	–	0.0045 U	–	0.0047 U	–	–	–	127	
Bromomethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	112	
Carbon Disulfide	–	–	–	0.0013 U	–	0.00094 U	–	–	–	8,000	
Carbon Tetrachloride	–	–	–	0.00090 U	–	0.00094 U	–	–	–	14.3	
Chlorobenzene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	1,600	
Chloroethane	–	–	–	0.0045 U	–	0.0047 U	–	–	–	NE	
Chloroform	–	–	–	0.00090 U	–	0.00094 U	–	–	–	32.3	
Chloromethane	–	–	–	0.0045 U	–	0.0047 U	–	–	–	NE	
cis-1,2-Dichloroethene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	160	
cis-1,3-Dichloropropene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	NE	
Dibromochloromethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	11.9	
Dibromomethane	–	–	–	0.00090 U	–	0.00094 U	–	–	–	800	
Dichlorodifluoromethane (CFC-12)	–	–	–	0.00090 U	–	0.00094 U	–	–	–	16,000	
Ethylbenzene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	6	N/A
Hexachlorobutadiene	–	–	–	0.0045 U	–	0.0047 U	–	–	–	12.8	
Isopropylbenzene (Cumene)	–	–	–	0.00090 U	–	0.00094 U	–	–	–	8,000	
Methyl Iodide (Iodomethane)	–	–	–	0.0045 U	–	0.0047 U	–	–	–	NE	
Methyl t-butyl ether	–	–	–	0.00090 U	–	0.00094 U	–	–	–	0.1	
Methylene Chloride	–	–	–	0.0045 U	–	0.0094 U	–	–	–	0.02	
Naphthalene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	5	
n-Butylbenzene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	4,000	
n-Propylbenzene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	8,000	
p-Isopropyltoluene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	NE	
Sec-Butylbenzene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	8,000	
Styrene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	16,000	
Tert-Butylbenzene	–	–	–	0.0012 U	–	0.00094 U	–	–	–	8,000	
Tetrachloroethene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	0.05	
Toluene	–	–	–	0.0045 U	–	0.0047 U	–	–	–	7	
Trans-1,2-Dichloroethene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	1,600	
Trans-1,3-Dichloropropene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	NE	
Trichloroethene	–	–	–	0.00090 U	–	0.00094 U	–	–	–	0.03	
Trichlorofluoromethane (CFC-11)	–	–	–	0.00090 U	–	0.00094 U	–	–	–	24,000	
Vinyl Acetate	–	–	–	0.0045 U	–	0.0047 U	–	–	–	80,000	
Vinyl Chloride	–	–	–	0.00090 U	–	0.00094 U	–	–	–	240	
Xylene, m-,p-	–	–	–	0.0018 U	–	0.0019 U	–	–	–	9	
Xylene, o-	–	–	–	0.00090 U	–	0.00094 U	–	–	–		
Total Xylenes[7]	–	–	–	0.0018 U	–	0.0019 U	–	–	–		

Boring Identification	FL232-B1		FL232-B2	FL232-B3	FL232-B4	FL232-B5		FL232-B6		MTCA Method A/B Cleanup Level[10]	Naturally Occurring Background Metals in Puget Sound Soils[14]
Sample Identification[2]	FL232-B1-3.5-4.5	FL232-B1-7.5-8.5	FL232-B2-3.5-4.5	FL232-B3-6.5-7.5	FL232-B4-3.5-4.5	FL232-B5-3.5-4.5	FL232-B5-7-8	FL232-B6-3.5-4.5	FL232-B6-11.5-12.5		
Sample Date	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017	5/24/2017		
Sample Start Depth (feet bgs)	3.5	7.5	3.5	6.5	3.5	3.5	7.0	3.5	11.5		
Sample End Depth (feet bgs)	4.5	8.5	4.5	7.5	4.5	4.5	8.0	4.5	12.5		
PAHs[8] (mg/kg)											
1-Methylnaphthalene	–	–	–	0.0074 U	–	0.0073 U	–	–	–	5	N/A
2-Methylnaphthalene	–	–	–	0.0074 U	–	0.0073 U	–	–	–		
Naphthalene	–	–	–	0.0074 U	–	0.0073 U	–	–	–		
Total Naphthalenes[9]	–	–	–	0.0074 U	–	0.0073 U	–	–	–		
Acenaphthene	–	–	–	0.0074 U	–	**0.013**	–	–	–	4,800	
Acenaphthylene	–	–	–	0.0074 U	–	0.0073 U	–	–	–	NE	
Anthracene	–	–	–	0.0074 U	–	**0.027**	–	–	–	24,000	
Benzo(a)anthracene (TEF 0.1)	–	–	–	0.0074 U	–	**0.11**	–	–	–	See cPAHs	
Benzo(a)pyrene (TEF 1)	–	–	–	0.0074 U	–	**0.10**	–	–	–	See cPAHs	
Benzo(b)fluoranthene (TEF 0.1)	–	–	–	0.0074 U	–	**0.12**	–	–	–	See cPAHs	
Benzo(g,h,i)perylene	–	–	–	0.0074 U	–	**0.086**	–	–	–	NE	
Benzo(j,k)fluoranthene (TEF 0.1)	–	–	–	0.0074 U	–	**0.037**	–	–	–	See cPAHs	
Chrysene (TEF 0.01)	–	–	–	0.0074 U	–	**0.12**	–	–	–	See cPAHs	
Dibenzo(a,h)anthracene (TEF 0.1)	–	–	–	0.0074 U	–	**0.016**	–	–	–	See cPAHs	
Fluoranthene	–	–	–	0.0074 U	–	**0.19**	–	–	–	3,200	
Fluorene	–	–	–	0.0074 U	–	**0.010**	–	–	–	3,200	
Indeno(1,2,3-c,d)pyrene (TEF 0.1)	–	–	–	0.0074 U	–	**0.086**	–	–	–	See cPAHs	
Phenanthrene	–	–	–	0.0074 U	–	**0.14**	–	–	–	NE	
Pyrene	–	–	–	0.0074 U	–	**0.17**	–	–	–	2,400	
cPAHs (benzo(a)pyrene toxicity equivalent concentration)[13]	–	–	–	0.0056 U	–	**0.14**	–	–	–	0.1	

Notes:

[1] Chemical analysis performed by OnSite Environmental, Inc., of Redmond, Washington.

[2] Sample ID = Parcel ID - boring number - depth of sample [feet bgs]. FL232-B1-3.5-4.5 = Boring 1 from Parcel FL232, collected from a depth of 3.5 to 4.5 feet bgs.

[3] Petroleum Hydrocarbon Identification by Northwest Method NWTPH-HCID.

[4] Diesel- and lube oil-range petroleum hydrocarbons by Northwest Method NWTPH-Dx.

[5] Resource Conservation Recovery Act (RCRA) metals analyzed by EPA 6000/7000 series method.

[6] Volatile organic compounds (VOCs) analyzed by United States Environmental Protection Agency (EPA) Method 8260C.

[7] Total xylenes consists of m,p- and o- xylenes. The higher detection limit is used for non-detects.

[8] Polycyclic aromatic hydrocarbons (PAHs) and carcinogenic PAHs (cPAHs) analyzed by EPA Method 8270D/SIM.

[9] Total naphthalenes consists of 1-methylnaphthalene, 2-methylnaphthalene and naphthalene.

[10] MTCA Method B cleanup level used when Method A cleanup level has not been established.

[11] Model Toxics Control Act (MTCA) Method A cleanup level for gasoline is 30 mg/kg if benzene is detected or if the sum of toluene, ethylbenzene and xylenes are greater than or equal to 1% of the total gasoline detection.

[12] MTCA Method A cleanup level for Trivalent Chromium.

[13] Results for cPAHs are shown as the sum of the benzo[a]pyrene toxicity equivalent concentrations, calculated by multiplying each individual cPAH concentration by its corresponding TEF. In this sum, nondetects are represented as ½ of the corresponding analyte reporting limit multiplied by the TEF.

[14] 90th Percentile for natural background soil metals concentrations in Puget Sound region, Department of Ecology, publication #94-115, dated October 1994.

"–" = not tested

bgs = below ground surface

MTCA = Model Toxics Control Act

mg/kg = milligrams per kilogram

NE = not established

N/A = not applicable

U = Analyte was not detected at or greater than the listed reporting limit.

TEF = Toxicity Equivalency Factor as defined in WAC 173-340-900 Table 708-2.

Est = Estimated from NWTPH-HCID chromatogram

Bold font type indicates that the analyte was detected at a concentration greater than the respective laboratory reporting limit.

Gray shading indicates that the detected result exceeds the specified MTCA Cleanup Level.

APPENDIX B

Site Photographs

Photograph 1: Test Pit PH232-1, adjacent to oil-water separator

Photograph 2: Drain field test pit PH232-3, showing fill soils, piping, and native soil

Photograph 3: Drain field test pit PH232-5, showing fill soils, piping, and native soil

Photograph 4: Test pit PH232-6, southeast parcel corner showing native soils

Photograph 5: Test pit PH232-7, showing fill soil with debris over piping and drain rock, native soils at base.

Photograph 6: Remedial excavation

Photograph 7: Remedial excavation, final extent. Sample locations staked.

APPENDIX C

Laboratory Analytical Reports and Chain-of Custody

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

O'Neill Service Group
Vance Atkins
17619 NE 67th Court, Suite 100
Redmond, WA 98052

RE: F200
Work Order Number: 2003007

March 09, 2020

Attention Vance Atkins:

Fremont Analytical, Inc. received 10 sample(s) on 3/2/2020 for the analyses presented in the following report.

Hydrocarbon Identification by NWTPH-HCID
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *03/09/2020*

CLIENT: O'Neill Service Group
Project: F200
Work Order: 2003007

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2003007-001	PH232-1-1	03/02/2020 9:30 AM	03/02/2020 12:44 PM
2003007-002	PH232-1-3	03/02/2020 9:35 AM	03/02/2020 12:44 PM
2003007-003	PH232-2-3	03/02/2020 10:15 AM	03/02/2020 12:44 PM
2003007-004	PH232-2-5	03/02/2020 10:20 AM	03/02/2020 12:44 PM
2003007-005	PH232-3-3	03/02/2020 10:50 AM	03/02/2020 12:44 PM
2003007-006	PH232-3-5	03/02/2020 10:55 AM	03/02/2020 12:44 PM
2003007-007	PH232-4-3	03/02/2020 11:15 AM	03/02/2020 12:44 PM
2003007-008	PH232-4-5	03/02/2020 11:20 AM	03/02/2020 12:44 PM
2003007-009	PH232-5-3	03/02/2020 11:30 AM	03/02/2020 12:44 PM
2003007-010	PH232-5-5	03/02/2020 11:35 AM	03/02/2020 12:44 PM

Case Narrative

WO#: **2003007**
Date: **3/9/2020**

CLIENT: O'Neill Service Group
Project: F200

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2003007**
Date Reported: **3/9/2020**

Client: O'Neill Service Group
Collection Date: 3/2/2020 9:30:00 AM
Project: F200
Lab ID: 2003007-001
Matrix: Soil
Client Sample ID: PH232-1-1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Hydrocarbon Identification by NWTPH-HCID				Batch ID: 27641		Analyst: DW
Gasoline	ND	21.0		mg/Kg-dry	1	3/3/2020 4:03:57 PM
Mineral Spirits	ND	31.5		mg/Kg-dry	1	3/3/2020 4:03:57 PM
Kerosene	ND	52.5		mg/Kg-dry	1	3/3/2020 4:03:57 PM
Diesel (Fuel Oil)	ND	52.5		mg/Kg-dry	1	3/3/2020 4:03:57 PM
Heavy Oil	ND	105		mg/Kg-dry	1	3/3/2020 4:03:57 PM
Mineral Oil	ND	105		mg/Kg-dry	1	3/3/2020 4:03:57 PM
Surr: 2-Fluorobiphenyl	110	50 - 150		%Rec	1	3/3/2020 4:03:57 PM
Surr: o-Terphenyl	111	50 - 150		%Rec	1	3/3/2020 4:03:57 PM
Sample Moisture (Percent Moisture)				Batch ID: R57732		Analyst: EH
Percent Moisture	9.44	0.500		wt%	1	3/3/2020 9:48:27 AM

Analytical Report

Work Order: **2003007**
Date Reported: **3/9/2020**

Client: O'Neill Service Group
Collection Date: 3/2/2020 9:35:00 AM
Project: F200
Lab ID: 2003007-002
Matrix: Soil
Client Sample ID: PH232-1-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Hydrocarbon Identification by NWTPH-HCID				Batch ID: 27641		Analyst: DW
Gasoline	ND	21.6		mg/Kg-dry	1	3/3/2020 5:34:31 PM
Mineral Spirits	ND	32.5		mg/Kg-dry	1	3/3/2020 5:34:31 PM
Kerosene	ND	54.1		mg/Kg-dry	1	3/3/2020 5:34:31 PM
Diesel (Fuel Oil)	ND	54.1		mg/Kg-dry	1	3/3/2020 5:34:31 PM
Heavy Oil	ND	108		mg/Kg-dry	1	3/3/2020 5:34:31 PM
Mineral Oil	ND	108		mg/Kg-dry	1	3/3/2020 5:34:31 PM
Surr: 2-Fluorobiphenyl	100	50 - 150		%Rec	1	3/3/2020 5:34:31 PM
Surr: o-Terphenyl	101	50 - 150		%Rec	1	3/3/2020 5:34:31 PM
Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	12.2	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group **Collection Date:** 3/2/2020 10:15:00 AM
Project: F200
Lab ID: 2003007-003 **Matrix:** Soil
Client Sample ID: PH232-2-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27647		Analyst: SB
Naphthalene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
2-Methylnaphthalene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
1-Methylnaphthalene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Acenaphthylene	ND	39.9	Q	µg/Kg-dry	1	3/4/2020 7:14:32 PM
Acenaphthene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Fluorene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Phenanthrene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Anthracene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Fluoranthene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Pyrene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Benz(a)anthracene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Chrysene	ND	39.9	Q	µg/Kg-dry	1	3/4/2020 7:14:32 PM
Benzo(b)fluoranthene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Benzo(k)fluoranthene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Benzo(a)pyrene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Indeno(1,2,3-cd)pyrene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Dibenz(a,h)anthracene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Benzo(g,h,i)perylene	ND	39.9		µg/Kg-dry	1	3/4/2020 7:14:32 PM
Surr: 2-Fluorobiphenyl	44.3	24.4 - 151		%Rec	1	3/4/2020 7:14:32 PM
Surr: Terphenyl-d14 (surr)	77.7	31.4 - 162		%Rec	1	3/4/2020 7:14:32 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	6.95	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group **Collection Date:** 3/2/2020 10:20:00 AM
Project: F200
Lab ID: 2003007-004 **Matrix:** Soil
Client Sample ID: PH232-2-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27647		Analyst: SB
Naphthalene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
2-Methylnaphthalene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
1-Methylnaphthalene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Acenaphthylene	ND	44.9	Q	µg/Kg-dry	1	3/4/2020 7:36:23 PM
Acenaphthene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Fluorene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Phenanthrene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Anthracene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Fluoranthene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Pyrene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Benz(a)anthracene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Chrysene	ND	44.9	Q	µg/Kg-dry	1	3/4/2020 7:36:23 PM
Benzo(b)fluoranthene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Benzo(k)fluoranthene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Benzo(a)pyrene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Indeno(1,2,3-cd)pyrene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Dibenz(a,h)anthracene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Benzo(g,h,i)perylene	ND	44.9		µg/Kg-dry	1	3/4/2020 7:36:23 PM
Surr: 2-Fluorobiphenyl	40.7	24.4 - 151		%Rec	1	3/4/2020 7:36:23 PM
Surr: Terphenyl-d14 (surr)	65.2	31.4 - 162		%Rec	1	3/4/2020 7:36:23 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	13.1	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group **Collection Date:** 3/2/2020 10:50:00 AM
Project: F200
Lab ID: 2003007-005 **Matrix:** Soil
Client Sample ID: PH232-3-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27647		Analyst: SB
Naphthalene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
2-Methylnaphthalene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
1-Methylnaphthalene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Acenaphthylene	ND	37.4	Q	µg/Kg-dry	1	3/4/2020 7:58:24 PM
Acenaphthene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Fluorene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Phenanthrene	48.5	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Anthracene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Fluoranthene	75.0	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Pyrene	71.2	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Benz(a)anthracene	40.8	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Chrysene	ND	37.4	Q	µg/Kg-dry	1	3/4/2020 7:58:24 PM
Benzo(b)fluoranthene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Benzo(k)fluoranthene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Benzo(a)pyrene	41.5	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Indeno(1,2,3-cd)pyrene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Dibenz(a,h)anthracene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Benzo(g,h,i)perylene	ND	37.4		µg/Kg-dry	1	3/4/2020 7:58:24 PM
Surr: 2-Fluorobiphenyl	45.0	24.4 - 151		%Rec	1	3/4/2020 7:58:24 PM
Surr: Terphenyl-d14 (surr)	60.5	31.4 - 162		%Rec	1	3/4/2020 7:58:24 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	7.30	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group **Collection Date:** 3/2/2020 10:55:00 AM
Project: F200
Lab ID: 2003007-006 **Matrix:** Soil
Client Sample ID: PH232-3-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27647		Analyst: SB
Naphthalene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
2-Methylnaphthalene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
1-Methylnaphthalene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Acenaphthylene	ND	42.0	Q	µg/Kg-dry	1	3/4/2020 8:20:23 PM
Acenaphthene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Fluorene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Phenanthrene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Anthracene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Fluoranthene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Pyrene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Benz(a)anthracene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Chrysene	ND	42.0	Q	µg/Kg-dry	1	3/4/2020 8:20:23 PM
Benzo(b)fluoranthene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Benzo(k)fluoranthene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Benzo(a)pyrene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Indeno(1,2,3-cd)pyrene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Dibenz(a,h)anthracene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Benzo(g,h,i)perylene	ND	42.0		µg/Kg-dry	1	3/4/2020 8:20:23 PM
Surr: 2-Fluorobiphenyl	22.2	24.4 - 151	S	%Rec	1	3/4/2020 8:20:23 PM
Surr: Terphenyl-d14 (surr)	55.2	31.4 - 162		%Rec	1	3/4/2020 8:20:23 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	16.2	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group
Collection Date: 3/2/2020 11:15:00 AM
Project: F200
Lab ID: 2003007-007
Matrix: Soil
Client Sample ID: PH232-4-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27687		Analyst: SB
Naphthalene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
2-Methylnaphthalene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
1-Methylnaphthalene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Acenaphthylene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Acenaphthene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Fluorene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Phenanthrene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Anthracene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Fluoranthene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Pyrene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Benz(a)anthracene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Chrysene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Benzo(b)fluoranthene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Benzo(k)fluoranthene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Benzo(a)pyrene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Indeno(1,2,3-cd)pyrene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Dibenz(a,h)anthracene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Benzo(g,h,i)perylene	ND	44.5		µg/Kg-dry	1	3/6/2020 3:52:40 PM
Surr: 2-Fluorobiphenyl	59.0	24.4 - 151		%Rec	1	3/6/2020 3:52:40 PM
Surr: Terphenyl-d14 (surr)	87.3	31.4 - 162		%Rec	1	3/6/2020 3:52:40 PM
Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	12.4	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group
Collection Date: 3/2/2020 11:20:00 AM
Project: F200
Lab ID: 2003007-008
Matrix: Soil
Client Sample ID: PH232-4-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27687		Analyst: SB
Naphthalene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
2-Methylnaphthalene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
1-Methylnaphthalene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Acenaphthylene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Acenaphthene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Fluorene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Phenanthrene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Anthracene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Fluoranthene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Pyrene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Benz(a)anthracene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Chrysene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Benzo(b)fluoranthene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Benzo(k)fluoranthene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Benzo(a)pyrene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Indeno(1,2,3-cd)pyrene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Dibenz(a,h)anthracene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Benzo(g,h,i)perylene	ND	40.0		µg/Kg-dry	1	3/6/2020 4:13:53 PM
Surr: 2-Fluorobiphenyl	49.8	24.4 - 151		%Rec	1	3/6/2020 4:13:53 PM
Surr: Terphenyl-d14 (surr)	69.9	31.4 - 162		%Rec	1	3/6/2020 4:13:53 PM
Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	13.2	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group **Collection Date:** 3/2/2020 11:30:00 AM
Project: F200
Lab ID: 2003007-009 **Matrix:** Soil
Client Sample ID: PH232-5-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27687		Analyst: SB
Naphthalene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
2-Methylnaphthalene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
1-Methylnaphthalene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Acenaphthylene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Acenaphthene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Fluorene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Phenanthrene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Anthracene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Fluoranthene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Pyrene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Benz(a)anthracene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Chrysene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Benzo(b)fluoranthene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Benzo(k)fluoranthene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Benzo(a)pyrene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Indeno(1,2,3-cd)pyrene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Dibenz(a,h)anthracene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Benzo(g,h,i)perylene	ND	42.9		µg/Kg-dry	1	3/6/2020 4:35:07 PM
Surr: 2-Fluorobiphenyl	68.4	24.4 - 151		%Rec	1	3/6/2020 4:35:07 PM
Surr: Terphenyl-d14 (surr)	92.8	31.4 - 162		%Rec	1	3/6/2020 4:35:07 PM
Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	8.73	0.500		wt%	1	3/4/2020 9:47:36 AM

Client: O'Neill Service Group
Collection Date: 3/2/2020 11:35:00 AM
Project: F200
Lab ID: 2003007-010
Matrix: Soil
Client Sample ID: PH232-5-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 27687		Analyst: SB
Naphthalene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
2-Methylnaphthalene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
1-Methylnaphthalene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Acenaphthylene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Acenaphthene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Fluorene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Phenanthrene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Anthracene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Fluoranthene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Pyrene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Benz(a)anthracene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Chrysene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Benzo(b)fluoranthene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Benzo(k)fluoranthene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Benzo(a)pyrene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Indeno(1,2,3-cd)pyrene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Dibenz(a,h)anthracene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Benzo(g,h,i)perylene	ND	43.4		µg/Kg-dry	1	3/6/2020 4:56:30 PM
Surr: 2-Fluorobiphenyl	57.3	24.4 - 151		%Rec	1	3/6/2020 4:56:30 PM
Surr: Terphenyl-d14 (surr)	80.0	31.4 - 162		%Rec	1	3/6/2020 4:56:30 PM
Sample Moisture (Percent Moisture)				Batch ID: R57769		Analyst: EH
Percent Moisture	11.7	0.500		wt%	1	3/4/2020 9:47:36 AM

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Hydrocarbon Identification by NWTPH-HCID

Sample ID: **MB-27641**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **3/2/2020**	RunNo: **57766**
Client ID: **MBLKS**	Batch ID: **27641**		Analysis Date: **3/3/2020**	SeqNo: **1153594**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	20.0									
Mineral Spirits	ND	30.0									
Kerosene	ND	50.0									
Diesel (Fuel Oil)	ND	50.0									
Heavy Oil	ND	100									
Mineral Oil	ND	100									
Surr: 2-Fluorobiphenyl	20.3		20.00		101	50	150				
Surr: o-Terphenyl	20.7		20.00		104	50	150				

Sample ID: **LCS-27641**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **3/2/2020**	RunNo: **57766**
Client ID: **LCSS**	Batch ID: **27641**		Analysis Date: **3/3/2020**	SeqNo: **1153595**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	475	50.0	500.0	0	95.0	65	135				
Surr: 2-Fluorobiphenyl	23.1		20.00		116	50	150				
Surr: o-Terphenyl	22.5		20.00		113	50	150				

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **MB-27687** SampType: **MBLK** Units: **µg/Kg** Prep Date: **3/6/2020** RunNo: **57843**
Client ID: **MBLKS** Batch ID: **27687** Analysis Date: **3/6/2020** SeqNo: **1154998**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	378		500.0		75.7	24.4	151				
Surr: Terphenyl-d14 (surr)	461		500.0		92.2	31.4	162				

Sample ID: **LCS-27687** SampType: **LCS** Units: **µg/Kg** Prep Date: **3/6/2020** RunNo: **57843**
Client ID: **LCSS** Batch ID: **27687** Analysis Date: **3/6/2020** SeqNo: **1154999**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	845	40.0	1,000	0	84.5	63.6	135				
2-Methylnaphthalene	849	40.0	1,000	0	84.9	61.5	140				
1-Methylnaphthalene	866	40.0	1,000	0	86.6	59.6	140				
Acenaphthylene	853	40.0	1,000	0	85.3	61.2	141				
Acenaphthene	852	40.0	1,000	0	85.2	62.3	134				

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **LCS-27687**	SampType: **LCS**	Units: **µg/Kg**	Prep Date: **3/6/2020**	RunNo: **57843**
Client ID: **LCSS**	Batch ID: **27687**		Analysis Date: **3/6/2020**	SeqNo: **1154999**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	844	40.0	1,000	0	84.4	64.1	134				
Phenanthrene	858	40.0	1,000	0	85.8	63.2	132				
Anthracene	840	40.0	1,000	0	84.0	61.5	136				
Fluoranthene	908	40.0	1,000	0	90.8	63.1	140				
Pyrene	892	40.0	1,000	0	89.2	63.4	140				
Benz(a)anthracene	940	40.0	1,000	0	94.0	62.7	148				
Chrysene	867	40.0	1,000	0	86.7	60.5	142				
Benzo(b)fluoranthene	937	40.0	1,000	0	93.7	55.8	158				
Benzo(k)fluoranthene	918	40.0	1,000	0	91.8	64	136				
Benzo(a)pyrene	961	40.0	1,000	0	96.1	61.9	151				
Indeno(1,2,3-cd)pyrene	847	40.0	1,000	0	84.7	48.3	147				
Dibenz(a,h)anthracene	849	40.0	1,000	0	84.9	47.9	150				
Benzo(g,h,i)perylene	862	40.0	1,000	0	86.2	44.4	144				
Surr: 2-Fluorobiphenyl	423		500.0		84.7	24.4	151				
Surr: Terphenyl-d14 (surr)	463		500.0		92.6	31.4	162				

Sample ID: **2002327-001ADUP**	SampType: **DUP**	Units: **µg/Kg-dry**	Prep Date: **3/6/2020**	RunNo: **57843**
Client ID: **BATCH**	Batch ID: **27687**		Analysis Date: **3/6/2020**	SeqNo: **1155001**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	53.4						0		30	H
2-Methylnaphthalene	ND	53.4						0		30	H
1-Methylnaphthalene	ND	53.4						0		30	H
Acenaphthylene	ND	53.4						0		30	H
Acenaphthene	ND	53.4						0		30	H
Fluorene	ND	53.4						0		30	H
Phenanthrene	ND	53.4						0		30	H
Anthracene	ND	53.4						0		30	H
Fluoranthene	ND	53.4						0		30	H
Pyrene	ND	53.4						0		30	H

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2002327-001ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **3/6/2020** RunNo: **57843**
Client ID: **BATCH** Batch ID: **27687** Analysis Date: **3/6/2020** SeqNo: **1155001**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	ND	53.4						0		30	H
Chrysene	ND	53.4						0		30	H
Benzo(b)fluoranthene	ND	53.4						0		30	H
Benzo(k)fluoranthene	ND	53.4						0		30	H
Benzo(a)pyrene	ND	53.4						0		30	H
Indeno(1,2,3-cd)pyrene	ND	53.4						0		30	H
Dibenz(a,h)anthracene	ND	53.4						0		30	H
Benzo(g,h,i)perylene	ND	53.4						0		30	H
Surr: 2-Fluorobiphenyl	402		668.1		60.2	24.4	151		0		H
Surr: Terphenyl-d14 (surr)	599		668.1		89.7	31.4	162		0		H

Sample ID: **2002327-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **3/6/2020** RunNo: **57843**
Client ID: **BATCH** Batch ID: **27687** Analysis Date: **3/6/2020** SeqNo: **1155002**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,040	54.4	1,359	0	76.8	37	127				H
2-Methylnaphthalene	1,070	54.4	1,359	0	78.8	38.9	128				H
1-Methylnaphthalene	1,090	54.4	1,359	0	80.6	36.2	129				H
Acenaphthylene	1,080	54.4	1,359	0	79.8	39	132				H
Acenaphthene	1,090	54.4	1,359	0	80.3	39.5	124				H
Fluorene	1,070	54.4	1,359	0	78.9	38.3	128				H
Phenanthrene	1,090	54.4	1,359	0	80.1	29.2	132				H
Anthracene	1,080	54.4	1,359	0	79.5	38.8	128				H
Fluoranthene	1,170	54.4	1,359	0	85.8	38.4	135				H
Pyrene	1,140	54.4	1,359	0	83.6	37.8	134				H
Benz(a)anthracene	1,220	54.4	1,359	11.06	89.2	39.2	143				H
Chrysene	1,090	54.4	1,359	0	80.0	35.9	131				H
Benzo(b)fluoranthene	1,300	54.4	1,359	0	95.6	36.3	148				H
Benzo(k)fluoranthene	1,040	54.4	1,359	0	76.2	31.2	133				H
Benzo(a)pyrene	1,190	54.4	1,359	0	87.8	35.9	144				H

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2002327-001AMS**	SampType: **MS**	Units: **µg/Kg-dry**	Prep Date: **3/6/2020**	RunNo: **57843**
Client ID: **BATCH**	Batch ID: **27687**		Analysis Date: **3/6/2020**	SeqNo: **1155002**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	1,050	54.4	1,359	0	77.1	25.3	131				H
Dibenz(a,h)anthracene	1,050	54.4	1,359	0	77.1	27.4	132				H
Benzo(g,h,i)perylene	1,070	54.4	1,359	5.420	78.3	20.1	128				H
Surr: 2-Fluorobiphenyl	440		679.4		64.7	24.4	151				H
Surr: Terphenyl-d14 (surr)	569		679.4		83.7	31.4	162				H

Sample ID: **2002327-001AMSD**	SampType: **MSD**	Units: **µg/Kg-dry**	Prep Date: **3/6/2020**	RunNo: **57843**
Client ID: **BATCH**	Batch ID: **27687**		Analysis Date: **3/6/2020**	SeqNo: **1155003**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,110	53.8	1,344	0	82.9	37	127	1,044	6.52	30	H
2-Methylnaphthalene	1,130	53.8	1,344	0	84.1	38.9	128	1,071	5.49	30	H
1-Methylnaphthalene	1,160	53.8	1,344	0	86.1	36.2	129	1,095	5.53	30	H
Acenaphthylene	1,140	53.8	1,344	0	85.0	39	132	1,084	5.26	30	H
Acenaphthene	1,150	53.8	1,344	0	85.8	39.5	124	1,092	5.49	30	H
Fluorene	1,140	53.8	1,344	0	84.6	38.3	128	1,072	5.97	30	H
Phenanthrene	1,140	53.8	1,344	0	84.8	29.2	132	1,089	4.55	30	H
Anthracene	1,120	53.8	1,344	0	83.7	38.8	128	1,080	4.11	30	H
Fluoranthene	1,250	53.8	1,344	0	92.9	38.4	135	1,166	6.88	30	H
Pyrene	1,220	53.8	1,344	0	91.0	37.8	134	1,136	7.38	30	H
Benz(a)anthracene	1,300	53.8	1,344	11.06	96.2	39.2	143	1,223	6.49	30	H
Chrysene	1,180	53.8	1,344	0	87.5	35.9	131	1,086	7.89	30	H
Benzo(b)fluoranthene	1,260	53.8	1,344	0	93.8	36.3	148	1,299	2.97	30	H
Benzo(k)fluoranthene	1,230	53.8	1,344	0	91.8	31.2	133	1,035	17.5	30	H
Benzo(a)pyrene	1,270	53.8	1,344	0	94.8	35.9	144	1,193	6.61	30	H
Indeno(1,2,3-cd)pyrene	1,130	53.8	1,344	0	84.0	25.3	131	1,047	7.57	30	H
Dibenz(a,h)anthracene	1,140	53.8	1,344	0	84.5	27.4	132	1,048	8.01	30	H
Benzo(g,h,i)perylene	1,160	53.8	1,344	5.420	85.6	20.1	128	1,070	7.79	30	H
Surr: 2-Fluorobiphenyl	478		672.0		71.2	24.4	151		0		H
Surr: Terphenyl-d14 (surr)	632		672.0		94.1	31.4	162		0		H

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2002327-001AMSD**	SampType: **MSD**			Units: **µg/Kg-dry**		Prep Date: **3/6/2020**			RunNo: **57843**		
Client ID: **BATCH**	Batch ID: **27687**					Analysis Date: **3/6/2020**			SeqNo: **1155003**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **MB-27647** SampType: **MBLK** Units: **µg/Kg** Prep Date: **3/3/2020** RunNo: **57788**
Client ID: **MBLKS** Batch ID: **27647** Analysis Date: **3/4/2020** SeqNo: **1153948**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									Q
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									Q
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	329		500.0		65.8	24.4	151				
Surr: Terphenyl-d14 (surr)	467		500.0		93.4	31.4	162				

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **LCS-27647** SampType: **LCS** Units: **µg/Kg** Prep Date: **3/3/2020** RunNo: **57788**
Client ID: **LCSS** Batch ID: **27647** Analysis Date: **3/4/2020** SeqNo: **1153949**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	701	40.0	1,000	0	70.1	63.6	135				
2-Methylnaphthalene	783	40.0	1,000	0	78.3	61.5	140				
1-Methylnaphthalene	777	40.0	1,000	0	77.7	59.6	140				
Acenaphthylene	713	40.0	1,000	0	71.3	61.2	141				

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **LCS-27647**	SampType: **LCS**	Units: **µg/Kg**	Prep Date: **3/3/2020**	RunNo: **57788**
Client ID: **LCSS**	Batch ID: **27647**		Analysis Date: **3/4/2020**	SeqNo: **1153949**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	745	40.0	1,000	0	74.5	62.3	134				
Fluorene	737	40.0	1,000	0	73.7	64.1	134				
Phenanthrene	713	40.0	1,000	0	71.3	63.2	132				
Anthracene	711	40.0	1,000	0	71.1	61.5	136				
Fluoranthene	708	40.0	1,000	0	70.8	63.1	140				
Pyrene	704	40.0	1,000	0	70.4	63.4	140				
Benz(a)anthracene	733	40.0	1,000	0	73.3	62.7	148				
Chrysene	671	40.0	1,000	0	67.1	60.5	142				
Benzo(b)fluoranthene	736	40.0	1,000	0	73.6	55.8	158				
Benzo(k)fluoranthene	820	40.0	1,000	0	82.0	64	136				
Benzo(a)pyrene	758	40.0	1,000	0	75.8	61.9	151				
Indeno(1,2,3-cd)pyrene	773	40.0	1,000	0	77.3	48.3	147				
Dibenz(a,h)anthracene	807	40.0	1,000	0	80.7	47.9	150				
Benzo(g,h,i)perylene	765	40.0	1,000	0	76.5	44.4	144				
Surr: 2-Fluorobiphenyl	362		500.0		72.4	24.4	151				
Surr: Terphenyl-d14 (surr)	441		500.0		88.2	31.4	162				

Sample ID: **2002471-016ADUP**	SampType: **DUP**	Units: **µg/Kg-dry**	Prep Date: **3/3/2020**	RunNo: **57788**
Client ID: **BATCH**	Batch ID: **27647**		Analysis Date: **3/4/2020**	SeqNo: **1153952**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	39.1						0		30	
2-Methylnaphthalene	ND	39.1						0		30	
1-Methylnaphthalene	ND	39.1						0		30	
Acenaphthylene	ND	39.1						0		30	Q
Acenaphthene	ND	39.1						0		30	
Fluorene	ND	39.1						0		30	
Phenanthrene	ND	39.1						0		30	
Anthracene	ND	39.1						0		30	
Fluoranthene	47.8	39.1						39.96	17.8	30	

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2002471-016ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **3/3/2020** RunNo: **57788**
Client ID: **BATCH** Batch ID: **27647** Analysis Date: **3/4/2020** SeqNo: **1153952**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pyrene	40.4	39.1						34.66	15.4	30	
Benz(a)anthracene	ND	39.1						0		30	
Chrysene	ND	39.1						0		30	Q
Benzo(b)fluoranthene	ND	39.1						0		30	
Benzo(k)fluoranthene	ND	39.1						0		30	
Benzo(a)pyrene	ND	39.1						0		30	
Indeno(1,2,3-cd)pyrene	ND	39.1						0		30	
Dibenz(a,h)anthracene	ND	39.1						0		30	
Benzo(g,h,i)perylene	ND	39.1						0		30	
Surr: 2-Fluorobiphenyl	261		488.9		53.3	24.4	151		0		
Surr: Terphenyl-d14 (surr)	333		488.9		68.2	31.4	162		0		

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **2002471-016AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **3/3/2020** RunNo: **57788**
Client ID: **BATCH** Batch ID: **27647** Analysis Date: **3/4/2020** SeqNo: **1153953**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	614	40.9	1,022	0	60.1	37	127				
2-Methylnaphthalene	681	40.9	1,022	0	66.6	38.9	128				
1-Methylnaphthalene	678	40.9	1,022	0	66.4	36.2	129				
Acenaphthylene	610	40.9	1,022	0	59.7	39	132				
Acenaphthene	651	40.9	1,022	0	63.7	39.5	124				
Fluorene	638	40.9	1,022	0	62.5	38.3	128				
Phenanthrene	639	40.9	1,022	14.84	61.1	29.2	132				
Anthracene	622	40.9	1,022	2.130	60.6	38.8	128				
Fluoranthene	692	40.9	1,022	39.96	63.8	38.4	135				
Pyrene	679	40.9	1,022	34.66	63.0	37.8	134				
Benz(a)anthracene	726	40.9	1,022	22.30	68.8	39.2	143				
Chrysene	617	40.9	1,022	24.20	57.9	35.9	131				
Benzo(b)fluoranthene	684	40.9	1,022	26.20	64.3	36.3	148				

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2002471-016AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **3/3/2020** RunNo: **57788**
Client ID: **BATCH** Batch ID: **27647** Analysis Date: **3/4/2020** SeqNo: **1153953**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	817	40.9	1,022	27.92	77.2	31.2	133				
Benzo(a)pyrene	735	40.9	1,022	22.90	69.7	35.9	144				
Indeno(1,2,3-cd)pyrene	685	40.9	1,022	17.59	65.3	25.3	131				
Dibenz(a,h)anthracene	692	40.9	1,022	7.379	67.0	27.4	132				
Benzo(g,h,i)perylene	684	40.9	1,022	20.91	64.8	20.1	128				
Surr: 2-Fluorobiphenyl	307		511.1		60.2	24.4	151				
Surr: Terphenyl-d14 (surr)	366		511.1		71.7	31.4	162				

Sample ID: **2002471-016AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **3/3/2020** RunNo: **57788**
Client ID: **BATCH** Batch ID: **27647** Analysis Date: **3/4/2020** SeqNo: **1153954**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	571	40.2	1,005	0	56.8	37	127	614.3	7.28	30	
2-Methylnaphthalene	637	40.2	1,005	0	63.4	38.9	128	680.6	6.60	30	
1-Methylnaphthalene	638	40.2	1,005	0	63.5	36.2	129	678.2	6.04	30	
Acenaphthylene	583	40.2	1,005	0	58.0	39	132	609.8	4.54	30	
Acenaphthene	612	40.2	1,005	0	61.0	39.5	124	651.3	6.15	30	
Fluorene	604	40.2	1,005	0	60.1	38.3	128	638.4	5.61	30	
Phenanthrene	622	40.2	1,005	14.84	60.4	29.2	132	639.0	2.73	30	
Anthracene	597	40.2	1,005	2.130	59.2	38.8	128	621.8	4.01	30	
Fluoranthene	685	40.2	1,005	39.96	64.2	38.4	135	692.0	1.04	30	
Pyrene	667	40.2	1,005	34.66	62.9	37.8	134	679.1	1.79	30	
Benz(a)anthracene	714	40.2	1,005	22.30	68.8	39.2	143	725.9	1.68	30	
Chrysene	594	40.2	1,005	24.20	56.7	35.9	131	616.5	3.78	30	
Benzo(b)fluoranthene	689	40.2	1,005	26.20	65.9	36.3	148	683.8	0.714	30	
Benzo(k)fluoranthene	736	40.2	1,005	27.92	70.5	31.2	133	817.4	10.4	30	
Benzo(a)pyrene	714	40.2	1,005	22.90	68.8	35.9	144	735.0	2.84	30	
Indeno(1,2,3-cd)pyrene	657	40.2	1,005	17.59	63.6	25.3	131	685.0	4.16	30	
Dibenz(a,h)anthracene	670	40.2	1,005	7.379	65.9	27.4	132	692.5	3.34	30	
Benzo(g,h,i)perylene	652	40.2	1,005	20.91	62.8	20.1	128	683.8	4.76	30	

Work Order: 2003007
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2002471-016AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **3/3/2020** RunNo: **57788**
Client ID: **BATCH** Batch ID: **27647** Analysis Date: **3/4/2020** SeqNo: **1153954**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 2-Fluorobiphenyl	275		502.4		54.7	24.4	151		0		
Surr: Terphenyl-d14 (surr)	354		502.4		70.4	31.4	162		0		

Sample Log-In Check List

Client Name:	**ONEILL**	Work Order Number:	**2003007**
Logged by:	**Carissa True**	Date Received:	**3/2/2020 12:44:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☐	No ☑	NA ☐
	Samples received straight from field			
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☐	No ☐	NA ☑
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler 1	12.7
Sample 1	10.0
Temp Blank 1	10.8

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 3/2/2020 Page: 1 of:

Project Name: F200

Project No: 2021

Collected by: DC

Location: FL232

Report To (PM): Vance

PM Email:

Laboratory Project No (internal): 2003007

Special Remarks:

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 30 days)

Client: OSG

Address:

City, State, Zip:

Telephone:

Fax:

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	PH232-1-1	3/2/20	930	S				X											
2	PH232-1-3		935					X											
3	PH232-2-3		1015								X								
4	PH232-2-5		1020								X								
5	PH232-3-3		1050								X								
6	PH232-3-5		1055								X								
7	PH232-4-3		1115								X								
8	PH232-4-5		1120								X								
9	PH232-5-3		1130								X								
10	PH232-5-5		1135								X								

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	3/2/20 1744	x	3/2/20 1244
Relinquished	Date/Time	Received	Date/Time
x		x	

Turn-around Time:

- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

O'Neill Service Group
Vance Atkins
17619 NE 67th Court, Suite 100
Redmond, WA 98052

RE: F200
Work Order Number: 2004260

April 24, 2020

Attention Vance Atkins:

Fremont Analytical, Inc. received 8 sample(s) on 4/22/2020 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *04/24/2020*

CLIENT: O'Neill Service Group
Project: F200
Work Order: 2004260

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2004260-001	232 PEX-1-3	04/22/2020 10:50 AM	04/22/2020 2:28 PM
2004260-002	232 PEX-2-5	04/22/2020 10:55 AM	04/22/2020 2:28 PM
2004260-003	PH232-6-3	04/22/2020 11:10 AM	04/22/2020 2:28 PM
2004260-004	PH232-6-5	04/22/2020 11:15 AM	04/22/2020 2:28 PM
2004260-005	PH232-7-3	04/22/2020 11:20 AM	04/22/2020 2:28 PM
2004260-006	PH232-7-5	04/22/2020 11:25 AM	04/22/2020 2:28 PM
2004260-007	PH232-8-3	04/22/2020 11:30 AM	04/22/2020 2:28 PM
2004260-008	PH232-8-5	04/22/2020 11:35 AM	04/22/2020 2:28 PM

Case Narrative

WO#: **2004260**
Date: **4/24/2020**

CLIENT: O'Neill Service Group
Project: F200

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 10:50:00 AM
Project: F200
Lab ID: 2004260-001
Matrix: Soil
Client Sample ID: 232 PEX-1-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	22.3		mg/Kg-dry	1	4/23/2020 9:47:30 PM
Heavy Oil	ND	55.8		mg/Kg-dry	1	4/24/2020 9:24:08 AM
Surr: 2-Fluorobiphenyl	95.0	50 - 150		%Rec	1	4/23/2020 9:47:30 PM
Surr: o-Terphenyl	99.5	50 - 150		%Rec	1	4/23/2020 9:47:30 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	44.7		µg/Kg-dry	1	4/24/2020 9:32:06 AM
Chrysene	ND	44.7		µg/Kg-dry	1	4/24/2020 9:32:06 AM
Benzo(b)fluoranthene	ND	44.7		µg/Kg-dry	1	4/24/2020 9:32:06 AM
Benzo(k)fluoranthene	ND	44.7		µg/Kg-dry	1	4/24/2020 9:32:06 AM
Benzo(a)pyrene	ND	44.7		µg/Kg-dry	1	4/24/2020 9:32:06 AM
Indeno(1,2,3-cd)pyrene	ND	44.7		µg/Kg-dry	1	4/24/2020 9:32:06 AM
Dibenz(a,h)anthracene	ND	44.7		µg/Kg-dry	1	4/24/2020 9:32:06 AM
Surr: 2-Fluorobiphenyl	62.1	24.4 - 151		%Rec	1	4/24/2020 9:32:06 AM
Surr: Terphenyl-d14 (surr)	64.6	31.4 - 162		%Rec	1	4/24/2020 9:32:06 AM
Sample Moisture (Percent Moisture)				Batch ID: R58734		Analyst: CJ
Percent Moisture	13.9	0.500		wt%	1	4/22/2020 4:42:36 PM

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 10:55:00 AM
Project: F200
Lab ID: 2004260-002
Matrix: Soil
Client Sample ID: 232 PEX-2-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	21.1		mg/Kg-dry	1	4/23/2020 10:17:46 PM
Heavy Oil	62.2	52.6		mg/Kg-dry	1	4/24/2020 9:54:24 AM
Surr: 2-Fluorobiphenyl	130	50 - 150		%Rec	1	4/23/2020 10:17:46 PM
Surr: o-Terphenyl	133	50 - 150		%Rec	1	4/23/2020 10:17:46 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	43.5		µg/Kg-dry	1	4/24/2020 9:53:32 AM
Chrysene	ND	43.5		µg/Kg-dry	1	4/24/2020 9:53:32 AM
Benzo(b)fluoranthene	ND	43.5		µg/Kg-dry	1	4/24/2020 9:53:32 AM
Benzo(k)fluoranthene	ND	43.5		µg/Kg-dry	1	4/24/2020 9:53:32 AM
Benzo(a)pyrene	ND	43.5		µg/Kg-dry	1	4/24/2020 9:53:32 AM
Indeno(1,2,3-cd)pyrene	ND	43.5		µg/Kg-dry	1	4/24/2020 9:53:32 AM
Dibenz(a,h)anthracene	ND	43.5		µg/Kg-dry	1	4/24/2020 9:53:32 AM
Surr: 2-Fluorobiphenyl	67.0	24.4 - 151		%Rec	1	4/24/2020 9:53:32 AM
Surr: Terphenyl-d14 (surr)	67.9	31.4 - 162		%Rec	1	4/24/2020 9:53:32 AM
Sample Moisture (Percent Moisture)				Batch ID: R58734		Analyst: CJ
Percent Moisture	12.3	0.500		wt%	1	4/22/2020 4:42:36 PM

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 11:10:00 AM
Project: F200
Lab ID: 2004260-003
Matrix: Soil
Client Sample ID: PH232-6-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	21.3		mg/Kg-dry	1	4/23/2020 10:47:53 PM
Heavy Oil	ND	53.3		mg/Kg-dry	1	4/23/2020 10:47:53 PM
Surr: 2-Fluorobiphenyl	87.3	50 - 150		%Rec	1	4/23/2020 10:47:53 PM
Surr: o-Terphenyl	90.6	50 - 150		%Rec	1	4/23/2020 10:47:53 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	42.8		µg/Kg-dry	1	4/24/2020 10:14:54 AM
Chrysene	ND	42.8		µg/Kg-dry	1	4/24/2020 10:14:54 AM
Benzo(b)fluoranthene	ND	42.8		µg/Kg-dry	1	4/24/2020 10:14:54 AM
Benzo(k)fluoranthene	ND	42.8		µg/Kg-dry	1	4/24/2020 10:14:54 AM
Benzo(a)pyrene	ND	42.8		µg/Kg-dry	1	4/24/2020 10:14:54 AM
Indeno(1,2,3-cd)pyrene	ND	42.8		µg/Kg-dry	1	4/24/2020 10:14:54 AM
Dibenz(a,h)anthracene	ND	42.8		µg/Kg-dry	1	4/24/2020 10:14:54 AM
Surr: 2-Fluorobiphenyl	62.0	24.4 - 151		%Rec	1	4/24/2020 10:14:54 AM
Surr: Terphenyl-d14 (surr)	73.8	31.4 - 162		%Rec	1	4/24/2020 10:14:54 AM
Sample Moisture (Percent Moisture)				Batch ID: R58734		Analyst: CJ
Percent Moisture	13.8	0.500		wt%	1	4/22/2020 4:42:36 PM

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 11:15:00 AM
Project: F200
Lab ID: 2004260-004
Matrix: Soil
Client Sample ID: PH232-6-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	18.8		mg/Kg-dry	1	4/23/2020 11:18:09 PM
Heavy Oil	ND	47.1		mg/Kg-dry	1	4/23/2020 11:18:09 PM
Surr: 2-Fluorobiphenyl	85.6	50 - 150		%Rec	1	4/23/2020 11:18:09 PM
Surr: o-Terphenyl	90.3	50 - 150		%Rec	1	4/23/2020 11:18:09 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	38.8		µg/Kg-dry	1	4/24/2020 10:36:18 AM
Chrysene	ND	38.8		µg/Kg-dry	1	4/24/2020 10:36:18 AM
Benzo(b)fluoranthene	ND	38.8		µg/Kg-dry	1	4/24/2020 10:36:18 AM
Benzo(k)fluoranthene	ND	38.8		µg/Kg-dry	1	4/24/2020 10:36:18 AM
Benzo(a)pyrene	ND	38.8		µg/Kg-dry	1	4/24/2020 10:36:18 AM
Indeno(1,2,3-cd)pyrene	ND	38.8		µg/Kg-dry	1	4/24/2020 10:36:18 AM
Dibenz(a,h)anthracene	ND	38.8		µg/Kg-dry	1	4/24/2020 10:36:18 AM
Surr: 2-Fluorobiphenyl	58.6	24.4 - 151		%Rec	1	4/24/2020 10:36:18 AM
Surr: Terphenyl-d14 (surr)	72.2	31.4 - 162		%Rec	1	4/24/2020 10:36:18 AM
Sample Moisture (Percent Moisture)				Batch ID: R58734		Analyst: CJ
Percent Moisture	5.25	0.500		wt%	1	4/22/2020 4:42:36 PM

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 11:20:00 AM
Project: F200
Lab ID: 2004260-005
Matrix: Soil
Client Sample ID: PH232-7-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	20.8		mg/Kg-dry	1	4/23/2020 11:48:14 PM
Heavy Oil	75.4	52.0		mg/Kg-dry	1	4/23/2020 11:48:14 PM
Surr: 2-Fluorobiphenyl	82.3	50 - 150		%Rec	1	4/23/2020 11:48:14 PM
Surr: o-Terphenyl	86.8	50 - 150		%Rec	1	4/23/2020 11:48:14 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	38.5		µg/Kg-dry	1	4/24/2020 10:57:44 AM
Chrysene	ND	38.5		µg/Kg-dry	1	4/24/2020 10:57:44 AM
Benzo(b)fluoranthene	ND	38.5		µg/Kg-dry	1	4/24/2020 10:57:44 AM
Benzo(k)fluoranthene	ND	38.5		µg/Kg-dry	1	4/24/2020 10:57:44 AM
Benzo(a)pyrene	ND	38.5		µg/Kg-dry	1	4/24/2020 10:57:44 AM
Indeno(1,2,3-cd)pyrene	ND	38.5		µg/Kg-dry	1	4/24/2020 10:57:44 AM
Dibenz(a,h)anthracene	ND	38.5		µg/Kg-dry	1	4/24/2020 10:57:44 AM
Surr: 2-Fluorobiphenyl	63.7	24.4 - 151		%Rec	1	4/24/2020 10:57:44 AM
Surr: Terphenyl-d14 (surr)	69.5	31.4 - 162		%Rec	1	4/24/2020 10:57:44 AM
Sample Moisture (Percent Moisture)				Batch ID: R58734		Analyst: CJ
Percent Moisture	10.7	0.500		wt%	1	4/22/2020 4:42:36 PM

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 11:25:00 AM
Project: F200
Lab ID: 2004260-006
Matrix: Soil
Client Sample ID: PH232-7-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	22.4		mg/Kg-dry	1	4/24/2020 12:18:30 AM
Heavy Oil	ND	56.0		mg/Kg-dry	1	4/24/2020 12:18:30 AM
Surr: 2-Fluorobiphenyl	97.6	50 - 150		%Rec	1	4/24/2020 12:18:30 AM
Surr: o-Terphenyl	104	50 - 150		%Rec	1	4/24/2020 12:18:30 AM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	45.2		µg/Kg-dry	1	4/24/2020 11:19:06 AM
Chrysene	ND	45.2		µg/Kg-dry	1	4/24/2020 11:19:06 AM
Benzo(b)fluoranthene	ND	45.2		µg/Kg-dry	1	4/24/2020 11:19:06 AM
Benzo(k)fluoranthene	ND	45.2		µg/Kg-dry	1	4/24/2020 11:19:06 AM
Benzo(a)pyrene	ND	45.2		µg/Kg-dry	1	4/24/2020 11:19:06 AM
Indeno(1,2,3-cd)pyrene	ND	45.2		µg/Kg-dry	1	4/24/2020 11:19:06 AM
Dibenz(a,h)anthracene	ND	45.2		µg/Kg-dry	1	4/24/2020 11:19:06 AM
Surr: 2-Fluorobiphenyl	55.6	24.4 - 151		%Rec	1	4/24/2020 11:19:06 AM
Surr: Terphenyl-d14 (surr)	76.5	31.4 - 162		%Rec	1	4/24/2020 11:19:06 AM
Sample Moisture (Percent Moisture)				Batch ID: R58734		Analyst: CJ
Percent Moisture	11.8	0.500		wt%	1	4/22/2020 4:42:36 PM

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 11:30:00 AM
Project: F200
Lab ID: 2004260-007
Matrix: Soil
Client Sample ID: PH232-8-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	20.7		mg/Kg-dry	1	4/24/2020 12:48:37 AM
Heavy Oil	ND	51.8		mg/Kg-dry	1	4/24/2020 12:48:37 AM
Surr: 2-Fluorobiphenyl	89.3	50 - 150		%Rec	1	4/24/2020 12:48:37 AM
Surr: o-Terphenyl	94.3	50 - 150		%Rec	1	4/24/2020 12:48:37 AM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	38.7		µg/Kg-dry	1	4/24/2020 11:40:30 AM
Chrysene	ND	38.7		µg/Kg-dry	1	4/24/2020 11:40:30 AM
Benzo(b)fluoranthene	ND	38.7		µg/Kg-dry	1	4/24/2020 11:40:30 AM
Benzo(k)fluoranthene	ND	38.7		µg/Kg-dry	1	4/24/2020 11:40:30 AM
Benzo(a)pyrene	ND	38.7		µg/Kg-dry	1	4/24/2020 11:40:30 AM
Indeno(1,2,3-cd)pyrene	ND	38.7		µg/Kg-dry	1	4/24/2020 11:40:30 AM
Dibenz(a,h)anthracene	ND	38.7		µg/Kg-dry	1	4/24/2020 11:40:30 AM
Surr: 2-Fluorobiphenyl	58.9	24.4 - 151		%Rec	1	4/24/2020 11:40:30 AM
Surr: Terphenyl-d14 (surr)	67.9	31.4 - 162		%Rec	1	4/24/2020 11:40:30 AM
Sample Moisture (Percent Moisture)				Batch ID: R58739		Analyst: EH
Percent Moisture	8.53	0.500		wt%	1	4/23/2020 9:52:06 AM

Analytical Report

Work Order: **2004260**
Date Reported: **4/24/2020**

Client: O'Neill Service Group
Collection Date: 4/22/2020 11:35:00 AM
Project: F200
Lab ID: 2004260-008
Matrix: Soil
Client Sample ID: PH232-8-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 28135		Analyst: DW
Diesel (Fuel Oil)	ND	20.4		mg/Kg-dry	1	4/24/2020 1:19:00 AM
Heavy Oil	ND	50.9		mg/Kg-dry	1	4/24/2020 1:19:00 AM
Surr: 2-Fluorobiphenyl	84.3	50 - 150		%Rec	1	4/24/2020 1:19:00 AM
Surr: o-Terphenyl	89.2	50 - 150		%Rec	1	4/24/2020 1:19:00 AM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 28136		Analyst: SB
Benz(a)anthracene	ND	39.9		µg/Kg-dry	1	4/24/2020 12:01:56 PM
Chrysene	ND	39.9		µg/Kg-dry	1	4/24/2020 12:01:56 PM
Benzo(b)fluoranthene	ND	39.9		µg/Kg-dry	1	4/24/2020 12:01:56 PM
Benzo(k)fluoranthene	ND	39.9		µg/Kg-dry	1	4/24/2020 12:01:56 PM
Benzo(a)pyrene	ND	39.9		µg/Kg-dry	1	4/24/2020 12:01:56 PM
Indeno(1,2,3-cd)pyrene	ND	39.9		µg/Kg-dry	1	4/24/2020 12:01:56 PM
Dibenz(a,h)anthracene	ND	39.9		µg/Kg-dry	1	4/24/2020 12:01:56 PM
Surr: 2-Fluorobiphenyl	48.4	24.4 - 151		%Rec	1	4/24/2020 12:01:56 PM
Surr: Terphenyl-d14 (surr)	67.4	31.4 - 162		%Rec	1	4/24/2020 12:01:56 PM
Sample Moisture (Percent Moisture)				Batch ID: R58739		Analyst: EH
Percent Moisture	8.70	0.500		wt%	1	4/23/2020 9:52:06 AM

Work Order: 2004260
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **MB-28135**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **4/22/2020**	RunNo: **58768**
Client ID: **MBLKS**	Batch ID: **28135**		Analysis Date: **4/23/2020**	SeqNo: **1173652**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	14.4		20.00		72.0	50	150				
Surr: o-Terphenyl	15.8		20.00		79.2	50	150				

Sample ID: **LCS-28135**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **4/22/2020**	RunNo: **58768**
Client ID: **LCSS**	Batch ID: **28135**		Analysis Date: **4/23/2020**	SeqNo: **1173653**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	456	20.0	500.0	0	91.2	65	135				
Surr: 2-Fluorobiphenyl	17.5		20.00		87.5	50	150				
Surr: o-Terphenyl	16.7		20.00		83.5	50	150				

Sample ID: **2004259-001ADUP**	SampType: **DUP**	Units: **mg/Kg-dry**	Prep Date: **4/22/2020**	RunNo: **58768**
Client ID: **BATCH**	Batch ID: **28135**		Analysis Date: **4/23/2020**	SeqNo: **1173656**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	21.2						0		30	
Heavy Oil	14,000	52.9						13,010	7.17	30	E
Surr: 2-Fluorobiphenyl	18.7		21.15		88.3	50	150		0		
Surr: o-Terphenyl	19.4		21.15		91.7	50	150		0		

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **2004260-008ADUP**	SampType: **DUP**	Units: **mg/Kg-dry**	Prep Date: **4/22/2020**	RunNo: **58768**
Client ID: **PH232-8-5**	Batch ID: **28135**		Analysis Date: **4/24/2020**	SeqNo: **1173666**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.9						0		30	
Heavy Oil	ND	52.4						0		30	

Work Order: 2004260
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **2004260-008ADUP**	SampType: **DUP**	Units: **mg/Kg-dry**	Prep Date: **4/22/2020**	RunNo: **58768**
Client ID: **PH232-8-5**	Batch ID: **28135**		Analysis Date: **4/24/2020**	SeqNo: **1173666**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 2-Fluorobiphenyl	16.8		20.94		80.0	50	150		0		
Surr: o-Terphenyl	18.1		20.94		86.2	50	150		0		

Sample ID: **2004260-008AMS**	SampType: **MS**	Units: **mg/Kg-dry**	Prep Date: **4/22/2020**	RunNo: **58768**
Client ID: **PH232-8-5**	Batch ID: **28135**		Analysis Date: **4/24/2020**	SeqNo: **1173667**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	544	18.8	468.9	0	116	65	135				
Surr: 2-Fluorobiphenyl	18.5		18.76		98.4	50	150				
Surr: o-Terphenyl	19.2		18.76		102	50	150				

Sample ID: **2004260-008AMSD**	SampType: **MSD**	Units: **mg/Kg-dry**	Prep Date: **4/22/2020**	RunNo: **58768**
Client ID: **PH232-8-5**	Batch ID: **28135**		Analysis Date: **4/24/2020**	SeqNo: **1173668**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	482	20.1	502.9	0	95.9	65	135	544.4	12.1	30	
Surr: 2-Fluorobiphenyl	17.8		20.12		88.6	50	150		0		
Surr: o-Terphenyl	17.8		20.12		88.5	50	150		0		

Work Order: 2004260
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **MB-28136**	SampType: **MBLK**	Units: **µg/Kg**	Prep Date: **4/22/2020**	RunNo: **58778**
Client ID: **MBLKS**	Batch ID: **28136**		Analysis Date: **4/24/2020**	SeqNo: **1173844**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Surr: 2-Fluorobiphenyl	336		500.0		67.1	24.4	151				
Surr: Terphenyl-d14 (surr)	433		500.0		86.7	31.4	162				

Sample ID: **LCS-28136**	SampType: **LCS**	Units: **µg/Kg**	Prep Date: **4/22/2020**	RunNo: **58778**
Client ID: **LCSS**	Batch ID: **28136**		Analysis Date: **4/24/2020**	SeqNo: **1173845**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	820	40.0	1,000	0	82.0	62.7	148				
Chrysene	838	40.0	1,000	0	83.8	60.5	142				
Benzo(b)fluoranthene	800	40.0	1,000	0	80.0	55.8	158				
Benzo(k)fluoranthene	872	40.0	1,000	0	87.2	64	136				
Benzo(a)pyrene	829	40.0	1,000	0	82.9	61.9	151				
Indeno(1,2,3-cd)pyrene	871	40.0	1,000	0	87.1	48.3	147				
Dibenz(a,h)anthracene	887	40.0	1,000	0	88.7	47.9	150				
Surr: 2-Fluorobiphenyl	371		500.0		74.1	24.4	151				
Surr: Terphenyl-d14 (surr)	423		500.0		84.5	31.4	162				

Sample ID: **2004258-001ADUP**	SampType: **DUP**	Units: **µg/Kg-dry**	Prep Date: **4/22/2020**	RunNo: **58778**
Client ID: **BATCH**	Batch ID: **28136**		Analysis Date: **4/24/2020**	SeqNo: **1173847**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	ND	45.1						0		30	
Chrysene	ND	45.1						0		30	

Work Order: 2004260
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2004258-001ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **4/22/2020** RunNo: **58778**
Client ID: **BATCH** Batch ID: **28136** Analysis Date: **4/24/2020** SeqNo: **1173847**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(b)fluoranthene	ND	45.1						0		30	
Benzo(k)fluoranthene	ND	45.1						0		30	
Benzo(a)pyrene	ND	45.1						0		30	
Indeno(1,2,3-cd)pyrene	ND	45.1						0		30	
Dibenz(a,h)anthracene	ND	45.1						0		30	
Surr: 2-Fluorobiphenyl	332		563.6		59.0	24.4	151		0		
Surr: Terphenyl-d14 (surr)	357		563.6		63.3	31.4	162		0		

Sample ID: **2004258-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **4/22/2020** RunNo: **58778**
Client ID: **BATCH** Batch ID: **28136** Analysis Date: **4/24/2020** SeqNo: **1173848**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	769	43.6	1,089	6.035	70.1	39.2	143				
Chrysene	764	43.6	1,089	0	70.2	35.9	131				
Benzo(b)fluoranthene	776	43.6	1,089	0	71.3	36.3	148				
Benzo(k)fluoranthene	731	43.6	1,089	0	67.1	31.2	133				
Benzo(a)pyrene	748	43.6	1,089	0	68.7	35.9	144				
Indeno(1,2,3-cd)pyrene	782	43.6	1,089	0	71.8	25.3	131				
Dibenz(a,h)anthracene	792	43.6	1,089	0	72.7	27.4	132				
Surr: 2-Fluorobiphenyl	354		544.7		65.0	24.4	151				
Surr: Terphenyl-d14 (surr)	381		544.7		69.9	31.4	162				

Sample ID: **2004258-001AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **4/22/2020** RunNo: **58778**
Client ID: **BATCH** Batch ID: **28136** Analysis Date: **4/24/2020** SeqNo: **1173849**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	752	42.4	1,060	6.035	70.4	39.2	143	769.3	2.29	30	
Chrysene	755	42.4	1,060	0	71.3	35.9	131	764.4	1.17	30	
Benzo(b)fluoranthene	687	42.4	1,060	0	64.8	36.3	148	776.3	12.2	30	
Benzo(k)fluoranthene	804	42.4	1,060	0	75.8	31.2	133	730.5	9.53	30	

Work Order: 2004260
CLIENT: O'Neill Service Group
Project: F200

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **2004258-001AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **4/22/2020** RunNo: **58778**
Client ID: **BATCH** Batch ID: **28136** Analysis Date: **4/24/2020** SeqNo: **1173849**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(a)pyrene	743	42.4	1,060	0	70.1	35.9	144	748.1	0.717	30	
Indeno(1,2,3-cd)pyrene	769	42.4	1,060	0	72.5	25.3	131	781.9	1.69	30	
Dibenz(a,h)anthracene	780	42.4	1,060	0	73.6	27.4	132	792.1	1.57	30	
Surr: 2-Fluorobiphenyl	344		529.9		64.9	24.4	151		0		
Surr: Terphenyl-d14 (surr)	366		529.9		69.1	31.4	162		0		

Sample Log-In Check List

Client Name:	**ONEILL**	Work Order Number:	**2004260**
Logged by:	**Clare Griggs**	Date Received:	**4/22/2020 2:28:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☑	No ☐	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	3.4
Sample	5.2

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 4/22/20 | Page: 1 of: 1 | Laboratory Project No (internal): 2004260

Project Name: F200 | Special Remarks:

Client: OSG | Project No: 2021

Address: | Collected by: ATKINS

City, State, Zip: | Location: PL232

Telephone: | Report To (PM): ATKINS | Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax: | PM Email:

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1	~~232~~PL232-1-3	4/22/20	1050	S				X			X								
2	~~232~~PL232-2-5		1055																
3	PH232-6-3		1110																
4	PH232-6-5		1115																
5	PH232-7-3		1120																
6	PH232-7-5		1125																
7	PH232-8-3		1130																
8	PH232-8-5		1135					✓			✓								
9																			
10																			

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x [signature]	4/22/20 1340	x [signature]	4/22/20 @ 1428
Relinquished	Date/Time	Received	Date/Time
x		x	

Turn-around Time:
- ☐ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day (specify)

APPENDIX D

Soil Disposal Information

REGIONAL DISPOSAL INTERMODAL --
3rd and lander Seattle, WA

REPRINT

01 **984078**

IN - Florence D. OUT - Kim L.

012976 - KLB Construction Inc
PO Box 158
Mukilteo, WA 98275-0158

4/22/20 9:28 am 4/22/20 10:18 am

134 KLB

Contract:TB-4608 PO:219056

Scale In	GROSS WEIGHT	102,020	NET TONS	31.53	INBOUND
Scale Out	TARE WEIGHT	38,960	NET WEIGHT	63,060	INVOICE

0.00	YD	Tracking QTY	
31.53	tn	SW-CONT W/FUEL	Origin:SEA-TAC/KING 100%

CHANGE:
CHECK :

REGIONAL DISPOSAL INTERMODAL --
3rd and lander Seattle, WA

REPRINT

01 **984079**

IN - Florence D. OUT - Kim L.

012976 - KLB Construction Inc
PO Box 158
Mukilteo, WA 98275-0158

4/22/20 11:21 am 4/22/20 11:38 am

134 KLB

Contract:TB-4608 PO:219056

Scale In	GROSS WEIGHT	101,260	NET TONS	30.87	INBOUND
Scale Out	TARE WEIGHT	39,520	NET WEIGHT	61,740	INVOICE

0.00	YD	Tracking QTY	
30.87	tn	SW-CONT W/FUEL	Origin:SEA-TAC/KING 100%

CHANGE:
CHECK :