**Undeveloped Land**

176th Street and 63rd Avenue
Puyallup, Pierce County, Washington

# TOPSOIL CHARACTERIZATION REPORT

**AUGUST 5, 2022**

**PREPARED FOR:**
**CH REALTY IX-JV I FRED310 INDUSTRIAL, L.P.**
c/o Panattoni Development Company, Inc.
7887 E. Belleview Avenue, Suite 475
Denver, CO 80111

**PREPARED BY:**
The VERTEX Companies, LLC
2420 W. 26th Avenue, Suite 100-D
Denver, CO 0211
**PHONE:** 303.623.9000

**VERTEX PROJECT NO:** 71555

August 5, 2022

Mr. Trevor McKune
Associate Risk Manager
CH REALTY IX-JV I FRED310 INDUSTRIAL, L.P. c/o
Panattoni Development Company, Inc.
7887 E. Belleview Avenue, Suite 475
Denver, CO 80111

Re: Topsoil Characterization Report
Undeveloped Land
176th Street and 63rd Avenue
Puyallup, Washington
VERTEX Project Number: 71555

Dear Mr. McKune:

The VERTEX Companies, LLC (VERTEX) is pleased to submit this Topsoil Characterization Report for the above referenced property (the Site). The purpose of this investigation was to characterize the quality of the topsoil at the Site for the purposes of profiling the soil for export during development.

The following report details the procedures of the sampling and summarizes the sampling results. The investigation was performed in general accordance with VERTEX proposal P.5447.22, dated June 27, 2022, and executed by Panattoni Development Company, Inc. on June 27, 2022.

Please do not hesitate to contact us at your convenience should you have any questions or comments regarding this report or our recommendations. It has been a pleasure working with you on this project.

Sincerely,

**The VERTEX Companies, LLC**

Steve Long
Regional Vice President

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# 1.0 INTRODUCTION

## 1.1 General Site Information

The "Site" or "Subject Property" for this investigation is located adjacent to the Boeing Frederickson Fabrication Division (BFFD) aircraft manufacturing plant at 18001 Canyon Road East, Puyallup, Pierce County, Washington, and consists of an approximately 312.1-acre vacant wooded property. The Site location is shown on **Figure 1**. A Site Vicinity Plan is provided as **Figure 2**. According to the Pierce County Assessor and Treasurers Office, the Site consists of two tracts of undeveloped land, totaling approximately 312-acres, occupying all, or parts of the following assessor's parcel numbers (APN):

| Parcel | APN | Listed Address | Acres |
|---|---|---|---|
| 2 | 0418061016 | 18001 Canyon Road East | 127.97 |
| 3 | 0419311021 | 6402 180th Street East | 184.13 |
| | | **Total** | **312.10** |

The Site is located within an area referred to as the Frederickson Industrial Park, which is located adjacent to the north, east, and south of the BFFD aircraft manufacturing plant. There are no current buildings on the Site and the parcels are not actively serviced by utilities.

## 1.2 Summary of Site History

The Site and surrounding properties historically operated as an explosives and propellants plant that manufactured trinitrotoluene (TNT), royal demolition explosive (RDX), and nitrocellulose-based propellants for small arms and artillery between 1936 and 1976 when the plant was closed. From about 1976 to 1986, the property operated as a sawmill. In 1987, Centrum Properties purchased the property for development of an industrial park. Centrum sold the property to Boeing in 1990 and Boeing subsequently developed the adjacent BFFD aircraft manufacturing plant on the adjacent property at that time. Boeing has not conducted any industrial operations

on the Site. A full summary of the Site and surrounding property history can be found in the VERTEX Phase I Environmental Site Assessment (ESA) Report, dated August 24, 2021.

VERTEX previously conducted a Phase II Limited Site Investigation (LSI) on the Site, dated August 27, 2021. The Phase II included collection and analysis of ten composite samples of the shallow topsoil at the site (0 to 6 inches below ground surface [bgs]). Based on the Phase I findings and concerns with historical operations, shallow composite soil samples were analyzed for Nitroaromatics, Nitramines, Nitrate Esters, and Nitroglycerin by EPA Method 8330B and perchlorate and perchlorate salts by EPA Method 314.0. None of the target analytes were detected in the shallow topsoil above the laboratory method detection limits (LMDLs) or the Washington Model Toxics Control Act (MTCA) Method A or Method B soil cleanup levels.

### 1.3 Purpose

VERTEX understands that CH REALTY IX-JV I FRED310 INDUSTRIAL, L.P. c/o Panattoni Development Company, Inc. (Panattoni) is planning to export the topsoil from the Site during the initial development activities for off-site disposal at the Washington Rock Quarries, Inc. King Creek Pit in Orting, Washington. Panattoni has requested further characterization of the topsoil in order to provide Washington Rock with a disposal profile for the soil and to ensure that the soil meets the requirements for disposal under the Washington Rock Quarries, Inc.'s disposal facility's permit.

### 1.4 Summary of Scope of Work

In order to characterize the topsoil at the Site for future disposal, VERTEX collected eleven (11) composite shallow samples from across the Site for laboratory analysis. The property was divided into eleven grids, each representing a 20 to 25 acre area of the Site. A ten-point shallow soil sample was collected from each grid using soil from 10 sub-samples collected throughout the grid at 0 to 6 inches bgs, which were composited into a single sample to represent the grid area. The composite soil samples were analyzed for Resource Conservation and Recovery Act (RCRA)

metals, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Total Petroleum Hydrocarbons as Gasoline (TPH-G), diesel (TPH-D) and oil (TPH-O).

# 2.0 FIELD ACTIVITIES

## 2.1 Utility Locate

Prior to drilling at the Site, VERTEX contacted the Washington Call Before You Dig utility notification center for public utility location services at the Site.

## 2.2 Shallow Composite Soil Sampling

In order to characterize the topsoil at the Site for future disposal, VERTEX collected eleven (11) composite shallow samples from across the Site for laboratory analysis. The samples were labeled as COMP-1 through COMP-11. The property was divided into eleven grids, each representing an approximately 20 to 25 acre area of the site. The composite grid locations are shown on Figure 3.

A ten-point shallow soil sample was collected from each grid. VERTEX collected ten (10) sub-samples from a depth of 0 to 6 inches bgs within the grid using a stainless-steel trowel. VERTEX attempted to geographically spread the sub-sample locations throughout the grid, subject to the constraints of the heavily wooded nature of much of the Site, which prevented access to all areas of the Site. The sub-samples were placed in a stainless-steel mixing bowl and thoroughly homogenized to create a single soil sample representing the grid. The soil samples were placed into 4 ounce, new glass containers provided by the laboratory and were placed in an iced cooler and shipped to the laboratory under chain of custody for analysis. The composite soil samples were analyzed by Friedman and Bruya, a Washington Department of Ecology (Ecology) certified laboratory, for the following target analytes:

- RCRA metals by EPA Methods 6010/7471
- VOCs by EPA Method 8260
- SVOCs by EPA Method 8270
- TPH-G by the NWTPH-Gx Method
- TPH-D and TPH-O by the NWTPH-Dx Method

# 3.0 LABORATORY ANALYTICAL RESULTS

## 3.1 Applicable Regulatory Standards

Soil, groundwater, and soil gas analytical results were compared to the Ecology Cleanup Levels and Risk Calculation (CLARC) Model Toxics Control Act (MCTA) Cleanup Levels (January 2020). Ecology has established variable cleanup levels under Method A, B, and C for both cancer and non-cancer health impacts for most chemicals of concern. The Method A and B cleanup levels are presented on the attached data tables. Some chemicals are known to produce both cancer and non-cancer health impacts. Where the chemical may produce both cancer and non-cancer health effects, the more stringent of the cancer or non-cancer endpoint is applied. Both the cancer and non-cancer health criteria are based on human health exposure through ingestion, dermal contact and inhalation of soil particles.

Additionally, Ecology has set MTCA cleanup levels for soil that are intended to protect groundwater. These levels were set at concentrations above which contaminants might leach from the soil into the groundwater, thereby creating a groundwater issue. Ecology typically does not apply the Soil: Protection of Groundwater Soil Cleanup Levels where the groundwater has been tested and does not contain the chemical of concern detected in the soil.

While the future use of the site is industrial, VERTEX first compared the data to the Method A and/or Method B unrestricted standards as a conservative approach. Method A/Method B unrestricted standards may apply if any of the soil is proposed to be transported off-site for re-use.

VERTEX also compared the concentrations of any detected petroleum constituents in the topsoil to the Ecology petroleum-impacted soil re-use criteria outlined in Ecology Publication No. 10-09-057, Guidance for Remediation of Petroleum Contaminated Sites, dated June 2016. Table 12.1 of this document outlines four potential soil re-use categories, which depend upon the concentrations of petroleum constituents detected in the soil. The petroleum contaminated soil re-use guidance is not strictly applicable to the Site as no petroleum impacts have been identified

that require remediation under MTCA. However, VERTEX has found that many disposal facilities utilize these criteria in evaluating the suitability of the soil for disposal or re-use.

### 3.2 Soil Analytical Results

VERTEX analyzed eleven (11) surficial composite soil samples from across the site that were labeled as COMP-1 through COMP-11. The surficial composite samples were analyzed for VOCs, SVOCs, RCRA Metals, TPH-G, TPH-D, and TPH-O. The soil analytical results for the composite samples are summarized in **Table 1**. A complete copy of the laboratory report is provided in **Appendix A**.

No target analytes were detected in any of the composite soil samples at concentrations exceeding the applicable MTCA Method A or Method B unrestricted use standards, with the exception of the detection of TPH-D and TPH-O at a combined concentration of 570 milligrams per kilogram (mg/kg) in COMP-2. Based on a conversation with the lab manager, VERTEX determined that the chromatogram for this result does not appear to be consistent with petroleum hydrocarbons and the chemist interpreted the results to be consistent with naturally occurring organics. The initial soil sample was analyzed by the laboratory without a silica gel cleanup to remove naturally occurring organics from the sample prior to analysis. TPH analysis with a silica gel cleanup is allowable by Ecology for soil samples that may contain naturally occurring organics. VERTEX subsequently requested that the laboratory re-analyze the soil sample for TPH-D and TPH-O with a silica gel cleanup. The results for both TPH-D and TPH-O were below the laboratory method detection limits (LMDLs); therefore it appears that the initial detection was not representative of petroleum hydrocarbons in the sample.

A number of polynuclear aromatic hydrocarbons (PAHs) were detected at low concentrations in COMP-11, including benzo(a)pyrene (BaP), benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. Rather than regulating each of these compounds individually, MTCA compares a weighted sum of these constituents to a single BaP toxic equivalency quotient (TEQ) soil cleanup level. The weighted sum of the detected PAH compounds as a BaP TEQ was calculated at 0.043

mg/kg. The calculated BaP TEQ is below the Method A unrestricted soil cleanup level of 0.1 mg/kg and is below the Ecology petroleum contaminated soil re-use guidance concentration for Category 1 (clean soil) of 0.05 mg/kg.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the Topsoil Characterization Investigation, it appears that the soil would be suitable for disposal at the Washington Rock King Creek Pit disposal facility. No target analytes were detected in the soil samples at concentrations exceeding the applicable MTCA Method A and B soil cleanup levels for unrestricted use, or the Ecology Petroleum Contaminated Soil Re-Use guidance concentrations for Category 1 soil re-use (No Detectable Petroleum Hydrocarbons).

The soil should be handled and disposed of in accordance with the Soil Management Plan for the Site dated January 14, 2022. The contractor should notify and request approval from Panattoni if they elect to dispose or re-use the soil at a facility other than the King Creek Pit disposal facility.

# 5.0 QUALIFICATIONS

## 5.1 Limitations and Exceptions

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. VERTEX is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

It must be recognized that environmental investigations are inherently limited in the sense that conclusions are drawn, and recommendations developed from information obtained from limited research and site investigation. All subsurface conditions at the site were not field investigated as part of this study and may differ from the conditions implied by the LSI. Additionally, the passage of time may result in a change in the environmental characteristics at this site and surrounding properties. VERTEX does not warrant that there are no toxic or hazardous materials or contamination on the site, nor does VERTEX accept any liability if such are found at some future time, or could have been found if additional studies, beyond the scope of this LSI, were conducted. VERTEX does not warrant against future operations or conditions, nor does VERTEX warrant against operations or conditions present of a type or at a location not investigated.

## 5.2 Special Terms and Conditions

The findings of this Topsoil Characterization Report are limited and based on the completeness and accuracy of the data and conditions of the site as of the date of the onsite investigation.

## 5.3 User Reliance

This report is for the exclusive use of Panattoni Development Company, Inc. CH REALTY IX-JV I FRED310 INDUSTRIAL, L.P. and affiliates, successors and assigns**,** and any and all holders of a note or notes secured by a mortgage, deed of trust, or deed to secure debt encumbering the Site;

and their respective affiliates, designates, successors and assignees, rating agencies, prospective bond holders, and bond holders. No other party shall have the right to rely on any service provided by VERTEX without prior written consent. Use of this report by any other party shall be at such party's sole risk.

# FIGURES

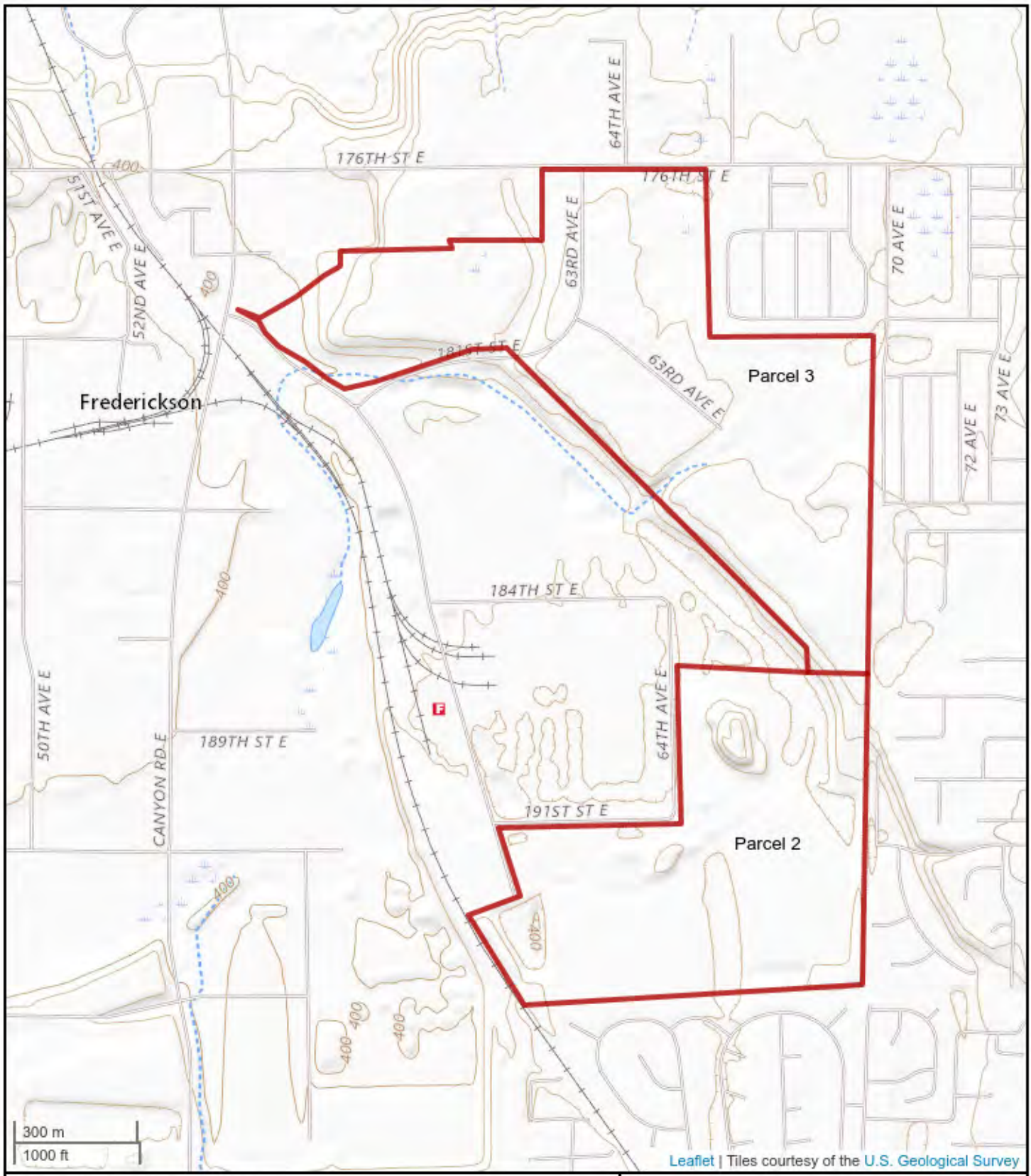


**Figure 1: Site Locus Map**

Boeing Frederickson Property
18001 Canyon Road East
Puyallup, Washington

VERTEX
VERTEXENG.COM
400 LIBBEY PARKWAY
WEYMOUTH, MA 02189
(T): 781.952.6000


Figure 2: Site Vicinity Map

Boeing Frederickson Property
18001 Canyon Road East
Puyallup, Washington

VERTEX
400 LIBBEY PARKWAY
WEYMOUTH, MA 02189
(T): 781.952.6000
VERTEXENG.COM

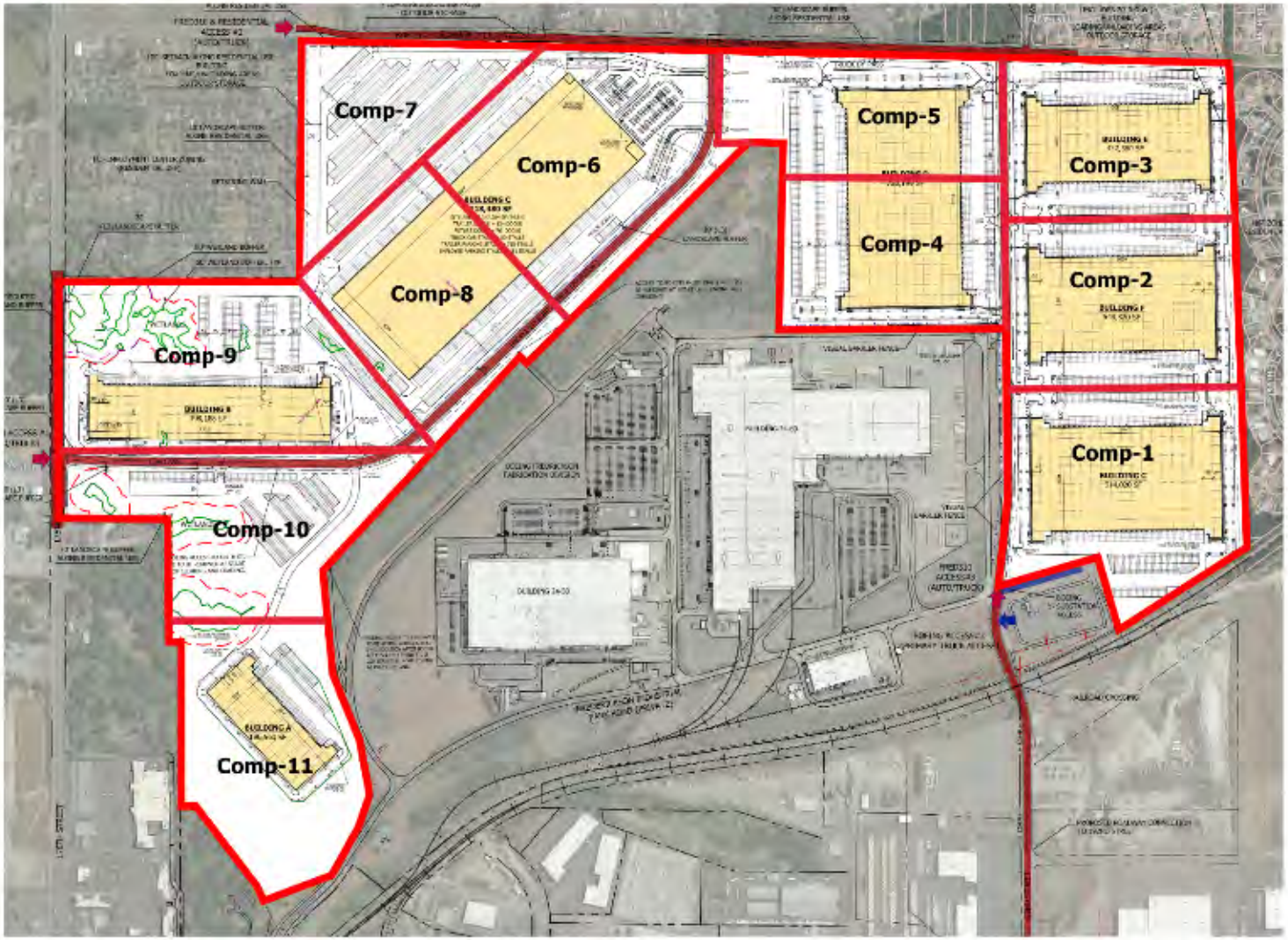


**Figure 3: Composite Soil Sampling Location Map**

Frederickson Industrial Park
18001 Canyon Road East
Puyallup, Washington

# TABLES

**Table 1**
**Summary of Soil Analytical Data**
**FRED 310**
**Puyallup, WA**
**VERTEX Project No. 71555**

| CHEMICAL NAME | MTCA METHOD A INDUSTRIAL | MTCA METHOD A UNRESTRICTED | MTCA METHOD B CANCER ENDPT. | MTCA METHOD B NON-CANCER ENDPT. | Sample ID | COMP-1 | COMP-2 | COMP-3 | COMP-4 | COMP-5 | COMP-6 | COMP-7 | COMP-8 | COMP-9 | COMP-10 | COMP-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date | 7/5/2022 | 7/5/2022 | 7/5/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 |
| | | | | | Lab ID | 207046-01 | 207046-02 | 207046-03 | 207101-01 | 207101-02 | 207101-03 | 207101-04 | 207101-05 | 207101-06 | 207101-07 | 207101-08 |
| **Volatile Organic Compounds** | | | | | Units | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | NSE | NSE | 38 | 2400 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,1,1-Trichloroethane (1,1,1-TCA) | 2 | 2 | NSE | 160000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,1,2-Trichloroethane | NSE | NSE | 18 | 320 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,1-Dichloroethane (1,1-DCA) | NSE | NSE | 180 | 16000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,1-Dichloroethene (1,1-DCE) | NSE | NSE | NSE | 4000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,1-Dichloropropene | NSE | NSE | NSE | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2,3-Trichlorobenzene | NSE | NSE | NSE | 64 | mg/kg | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| 1,2,3-Trichloropropane | NSE | NSE | 0.0063 | 320 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2,4-Trichlorobenzene | NSE | NSE | 34 | 800 | mg/kg | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| 1,2,4-Trimethylbenzene | NSE | NSE | NSE | 800 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2-Dibromo-3-Chloropropane | NSE | NSE | 0.23 | 16 | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 1,2-Dibromoethane (EDB) | 0.005 | 0.005 | 0.5 | 720 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2-Dichlorobenzene | NSE | NSE | NSE | 7200 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2-Dichloroethane (1,2-DCA) | NSE | NSE | 11 | 480 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2-Dichloroethylene, cis (1,2-DCE, cis) | NSE | NSE | NSE | 160 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2-Dichloroethylene, trans (1,2-DCE, trans) | NSE | NSE | NSE | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2-Dichloropropane | NSE | NSE | 27 | 3200 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,3,5-Trimethylbenzene | NSE | NSE | NSE | 800 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,3-Dichlorobenzene (1,3-DCB) | NSE | NSE | NSE | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,3-Dichloropropane | NSE | NSE | NSE | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,3-Dichloropropene, cis | NSE | NSE | NSE | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,3-Dichloropropene, trans | NSE | NSE | NSE | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,4-Dichlorobenzene | NSE | NSE | 190 | 5600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 2,2-Dichloropropane | NSE | NSE | NSE | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 2-Hexanone | NSE | NSE | NSE | 400 | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Acetone | NSE | NSE | NSE | 72000 | mg/kg | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) |
| Benzene | 0.03 | 0.03 | 18 | 320 | mg/kg | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) | ND(0.03) |
| Bromobenzene | NSE | NSE | NSE | 640 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Bromodichloromethane | NSE | NSE | 16 | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Bromoform | NSE | NSE | 130 | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Bromomethane | NSE | NSE | NSE | 110 | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Carbon Tetrachloride | NSE | NSE | 14 | 320 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Chlorobenzene | NSE | NSE | NSE | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Chloroethane | NSE | NSE | NSE | NSE | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Chloroform | NSE | NSE | 32 | 800 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Chloromethane | NSE | NSE | NSE | NSE | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Dibromochloromethane | NSE | NSE | 12 | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Dibromomethane | NSE | NSE | NSE | 800 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Dichlorodifluoromethane | NSE | NSE | NSE | 16000 | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Ethylbenzene | 6 | 6 | NSE | 8000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Hexachlorobutadiene | NSE | NSE | 13 | 80 | mg/kg | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| Hexane (N-Hexane) | NSE | NSE | NSE | 4800 | mg/kg | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| Isopropyl Benzene | NSE | NSE | NSE | 8000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Methyl Ethyl Ketone (MEK) | NSE | NSE | NSE | 48000 | mg/kg | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) |
| Methyl Isobutyl Ketone (MIBK) | NSE | NSE | NSE | 6400 | mg/kg | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) |
| Methyl Tert-Butyl Ether (MTBE) | 0.1 | 0.1 | 560 | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Methylene Chloride | 0.02 | 0.02 | 94 | 480 | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Naphthalene | 5 | 5 | NSE | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| o-Chlorotoluene | NSE | NSE | NSE | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| o-Xylene | NSE | NSE | NSE | 16000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| p/m-Xylene | NSE | NSE | NSE | NSE | mg/kg | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) | ND(0.1) |
| p-Chlorotoluene (4-Chlorotoluene) | NSE | NSE | NSE | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| p-Cymene | NSE | NSE | NSE | NSE | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Propylbenzene | NSE | NSE | NSE | 8000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Sec-Butylbenzene | NSE | NSE | NSE | 8000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Styrene | NSE | NSE | NSE | 16000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Tert-Butylbenzene | NSE | NSE | NSE | 8000 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Tetrachloroethane | NSE | NSE | 5 | 1600 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Tetrachloroethylene (PCE) | 0.05 | 0.05 | 480 | 480 | mg/kg | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) | ND(0.025) |
| Toluene | 7 | 7 | NSE | 6400 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Trichloroethylene (TCE) | 0.03 | 0.03 | 12 | 40 | mg/kg | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) | ND(0.02) |
| Trichlorofluoromethane | NSE | NSE | NSE | 24000 | mg/kg | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Vinyl Chloride | NSE | NSE | 0.67 | 240 | mg/kg | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |

**Table 1**
**Summary of Soil Analytical Data**
**FRED 310**
**Puyallup, WA**
**VERTEX Project No. 71555**

| CHEMICAL NAME | MTCA METHOD A INDUSTRIAL | MTCA METHOD A UNRESTRICTED | MTCA METHOD B CANCER ENDPT. | MTCA METHOD B NON-CANCER ENDPT. | Units | Sample ID | COMP-1 | COMP-2 | COMP-3 | COMP-4 | COMP-5 | COMP-6 | COMP-7 | COMP-8 | COMP-9 | COMP-10 | COMP-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample Date | 7/5/2022 | 7/5/2022 | 7/5/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 | 7/6/2022 |
| | | | | | | Lab ID | 207046-01 | 207046-02 | 207046-03 | 207101-01 | 207101-02 | 207101-03 | 207101-04 | 207101-05 | 207101-06 | 207101-07 | 207101-08 |
| **Semivolatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | NSE | NSE | 34 | 800 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,2-Dichlorobenzene | NSE | NSE | NSE | 7200 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,3-Dichlorobenzene (1,3-DCB) | NSE | NSE | NSE | NSE | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1,4-Dichlorobenzene | NSE | NSE | 190 | 5600 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 1-Methylnaphthalene | NSE | NSE | 34 | 5600 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| 2,4,5-Trichlorophenol | NSE | NSE | NSE | 8000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 2,4,6-Trichlorophenol | NSE | NSE | 91 | 80 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 2,4-Dichlorophenol | NSE | NSE | NSE | 240 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 2,4-Dimethylphenol | NSE | NSE | NSE | 1600 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 2,4-Dinitrophenol | NSE | NSE | NSE | 160 | mg/kg | | ND(1.5) | ND(7.5) | ND(1.5) | ND(7.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) |
| 2,4-Dinitrotoluene | NSE | NSE | 3.2 | 160 | mg/kg | | ND(0.25) | ND(1.2) | ND(0.25) | ND(1.2) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| 2,6-Dinitrotoluene | NSE | NSE | 0.67 | 24 | mg/kg | | ND(0.25) | ND(1.2) | ND(0.25) | ND(1.2) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| 2-Chloronaphthalene | NSE | NSE | NSE | 6400 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 2-Chlorophenol | NSE | NSE | NSE | 400 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 2-Methylnaphthalene | NSE | NSE | NSE | 320 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| 2-Methylphenol (o-Cresol) | NSE | NSE | NSE | 4000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 2-Nitroaniline | NSE | NSE | NSE | 800 | mg/kg | | ND(0.25) | ND(1.2) | ND(0.25) | ND(1.2) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| 2-Nitrophenol (o-Nitrophenol) | NSE | NSE | NSE | NSE | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| 3-Methylphenol/4-Methylphenol (m,p-cresol) | | | | | mg/kg | | ND(1) | ND(5) | ND(1) | ND(5) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) |
| 3-Nitroaniline | NSE | NSE | NSE | NSE | mg/kg | | ND(5) | ND(25) | ND(5) | ND(25) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) |
| 4-Bromophenyl Phenyl Ether | NSE | NSE | NSE | NSE | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| 4-Chlorophenyl Phenyl Ether | NSE | NSE | NSE | NSE | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Acenaphthene | NSE | NSE | NSE | 4800 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| Acenaphthylene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| Anthracene | NSE | NSE | NSE | 24000 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| Benzo(a)Anthracene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.024** |
| Benzo(a)Pyrene | 2 | 0.1 | 0.19 | 24 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.032** |
| Benzo(b)Fluoranthene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | 0.011 | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.012** | ND(0.01) | **0.047** |
| Benzo(g,h,i)Perylene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| Benzo(k)Fluoranthene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.016** |
| Benzoic Acid | NSE | NSE | NSE | 320000 | mg/kg | | ND(2.5) | ND(12) | ND(2.5) | ND(12) | ND(2.5) | ND(2.5) | ND(2.5) | ND(2.5) | ND(2.5) | ND(2.5) | ND(2.5) |
| Benzyl Alcohol | NSE | NSE | NSE | 8000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Bis (2-Chloroethyl) Ether | NSE | NSE | 0.91 | NSE | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Bis(2-Chloroisopropyl)Ether | | | | | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Bis(2-Ethylhexyl)Phthalate | NSE | NSE | 71 | 1600 | mg/kg | | ND(0.8) | ND(4) | ND(0.8) | ND(4) | ND(0.8) | ND(0.8) | ND(0.8) | ND(0.8) | ND(0.8) | ND(0.8) | ND(0.8) |
| Butyl Benzyl Phthalate | NSE | NSE | 530 | 16000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Carbazole | NSE | NSE | NSE | NSE | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Chrysene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.026** |
| Dibenzo(a,h)Anthracene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| Dibenzofuran | NSE | NSE | NSE | 80 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Dichloromethoxy Ethane | 0 | 0 | NSE | 240 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Diethyl Phthalate | NSE | NSE | NSE | 64000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Dimethyl Phthalate | NSE | NSE | NSE | NSE | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Dinitrocresol | NSE | NSE | NSE | 6.4 | mg/kg | | ND(1.5) | ND(7.5) | ND(1.5) | ND(7.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) |
| Fluoranthene | NSE | NSE | NSE | 3200 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.064** |
| Fluorene | NSE | NSE | NSE | 3200 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| Hexachlorobenzene | NSE | NSE | 0.63 | 64 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Hexachlorobutadiene | NSE | NSE | 13 | 80 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Hexachlorocyclopentadiene | NSE | NSE | NSE | 480 | mg/kg | | ND(0.15) | ND(0.75) | ND(0.15) | ND(0.75) | ND(0.15) | ND(0.15) | ND(0.15) | ND(0.15) | ND(0.15) | ND(0.15) | ND(0.15) |
| Hexachloroethane | NSE | NSE | 25 | 56 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Indeno(1,2,3-cd)Pyrene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.013** |
| Isophorone | NSE | NSE | 1100 | 16000 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Naphthalene | 5 | 5 | NSE | 1600 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) |
| n-Butyl Phthalate | NSE | NSE | NSE | 8000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| n-Dioctyl Phthalate | NSE | NSE | NSE | 800 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| NDPA/DPA | NSE | NSE | 200 | NSE | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| Nitrobenzene | NSE | NSE | NSE | 160 | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| N-Nitrosodi-N-Propylamine | NSE | NSE | 0.14 | NSE | mg/kg | | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.25) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) | ND(0.05) |
| p-Chloroaniline | NSE | NSE | 5 | 320 | mg/kg | | ND(5) | ND(25) | ND(5) | ND(25) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) |
| p-Chloro-m-Cresol | NSE | NSE | NSE | 8000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| Pentachlorophenol | NSE | NSE | 2.5 | 400 | mg/kg | | ND(0.25) | ND(1.2) | ND(0.25) | ND(1.2) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) | ND(0.25) |
| Phenanthrene | NSE | NSE | NSE | NSE | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.04** |
| Phenol | NSE | NSE | NSE | 24000 | mg/kg | | ND(0.5) | ND(2.5) | ND(0.5) | ND(2.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) | ND(0.5) |
| p-Nitroaniline | 0 | 0 | 50 | 320 | mg/kg | | ND(5) | ND(25) | ND(5) | ND(25) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) |
| p-Nitrophenol | NSE | NSE | NSE | NSE | mg/kg | | ND(1.5) | ND(7.5) | ND(1.5) | ND(7.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) | ND(1.5) |
| Pyrene | NSE | NSE | NSE | 2400 | mg/kg | | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.05) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | ND(0.01) | **0.057** |
| **Metals** | | | | | | | | | | | | | | | | | |
| Arsenic | 20 | 20 | 0.67 | 24 | mg/kg | | **3.93** | **4.74** | **4.07** | **3.27** | **2.47** | **3.58** | **2.5** | **2.38** | **2.34** | **2.95** | **2.74** |
| Barium | NSE | NSE | NSE | 16000 | mg/kg | | **91.5** | **109** | **92.3** | **46.1** | **54.2** | **70.6** | **64.1** | **66.3** | **63.9** | **79.2** | **73.7** |
| Cadmium | 2 | 2 | NSE | 80 | mg/kg | | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) |
| Chromium | 2000 | 2000 | NSE | 120000 | mg/kg | | **12.9** | **6.9** | **8.53** | **9.03** | **8.26** | **8.89** | **9.05** | **12.5** | **14.4** | **13.2** | **12.8** |
| Lead | 1000 | 250 | NSE | NSE | mg/kg | | **9.19** | **16.2** | **10.1** | **5.67** | **7.88** | **11.4** | **6.27** | **6.73** | **5.44** | **7.89** | **7.09** |
| Mercury | 2 | 2 | NSE | NSE | mg/kg | | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) |
| Selenium | NSE | NSE | NSE | 400 | mg/kg | | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) |
| Silver | NSE | NSE | NSE | 400 | mg/kg | | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) | ND(1) |
| **NW TPH-Diesel Range** | | | | | | | | | | | | | | | | | |
| Motor Oil | 2000 | 2000 | NSE | NSE | mg/kg | | ND(250) | **430/ND*** ** | ND(250) | ND(250) | ND(250) | ND(250) | ND(250) | ND(250) | ND(250) | ND(250) | ND(250) |
| TPH Diesel Range Organics (TPH-DRO) | | | | | mg/kg | | ND(50) | **140/ND*** ** | ND(50) | ND(50) | ND(50) | ND(50) | ND(50) | ND(50) | ND(50) | ND(50) | ND(50) |
| **NW TPH-Gasoline Range** | | | | | | | | | | | | | | | | | |
| TPH Gasoline Range Hydrocarbons (TPH-GRO) | 30 | 30 | NSE | NSE | mg/kg | | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) | ND(5) |

Notes:
• mg/kg = milligram per kilogram
• ND = Not Detected above laboratory reporting limits shown in parenthesis
• - - = Not Analyzed
• NSE = No Standard Exists
Bold Type Indicates that the analyte was detected above the LMDL
*** - Initial result presented is for TPH with no silica gel cleanup and the second result is for TPH with silica gel cleanup. Ecology utilizes the results with silica gel cleanup for comparison with the MTCA soil cleanup levels.
• Full analytical results, including QA/QC information and data flags, are detailed in the laboratory analytical report

# APPENDIX A:

# Laboratory Analytical Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 13, 2022

Jason Cass, Project Manager
Vertex
810 3rd Ave, Suite 307
Seattle, WA 98104

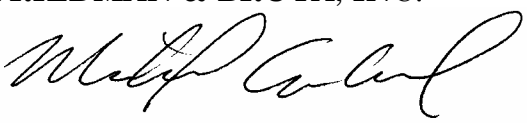
Dear Mr Cass:

Included are the results from the testing of material submitted on July 6, 2022 from the Fredrickson 71555, F&BI 207046 project. There are 24 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
VTX0713R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 6, 2022 by Friedman & Bruya, Inc. from the Vertex Fredrickson 71555, F&BI 207046 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Vertex |
|---|---|
| 207046 -01 | Comp-1 |
| 207046 -02 | Comp-2 |
| 207046 -03 | Comp-3 |

The 8260D calibration standard failed the acceptance criteria for chloroform. The data were flagged accordingly.

Arsenic and silver in the 6020B matrix spike and matrix spike duplicate failed the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

The 8260D matrix spike and matrix spike duplicate failed the relative percent difference for several compounds. The analytes were not detected therefore the data were acceptable.

2,4-Dimethylphenol and benzoic acid in the 8270E matrix spike and matrix spike duplicate failed the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

All other quality control requirements were acceptable.

Date of Report: 07/13/22
Date Received: 07/06/22
Project: Fredrickson 71555, F&BI 207046
Date Extracted: 07/08/22
Date Analyzed: 07/11/22

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

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

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate<br>(% Recovery)<br>(Limit 58-139) |
|---|---|---|
| Comp-1<br>207046-01 | <5 | 92 |
| Comp-2<br>207046-02 | <5 | 84 |
| Comp-3<br>207046-03 | <5 | 85 |
| Method Blank<br>02-1549 MB2 | <5 | 89 |

Date of Report: 07/13/22
Date Received: 07/06/22
Project: Fredrickson 71555, F&BI 207046
Date Extracted: 07/06/22
Date Analyzed: 07/06/22

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

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

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 56-165) |
|---|---|---|---|
| Comp-1<br>207046-01 | <50 | <250 | 95 |
| Comp-2<br>207046-02 | 140 x | 430 x | 102 |
| Comp-3<br>207046-03 | <50 | <250 | 90 |
| Method Blank<br>02-1585 MB2 | <50 | <250 | 102 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-1 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/08/22 | Lab ID: | 207046-01 |
| Date Analyzed: | 07/08/22 | Data File: | 207046-01.132 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | WE |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.93 |
| Barium | 91.5 |
| Cadmium | <1 |
| Lead | 9.19 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-1 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/08/22 | Lab ID: | 207046-01 x5 |
| Date Analyzed: | 07/08/22 | Data File: | 207046-01 x5.152 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | WE |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Chromium | 12.9 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-2 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/08/22 | Lab ID: | 207046-02 |
| Date Analyzed: | 07/08/22 | Data File: | 207046-02.133 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | WE |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.74 |
| Barium | 109 |
| Cadmium | <1 |
| Chromium | 6.90 |
| Lead | 16.2 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-3 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/08/22 | Lab ID: | 207046-03 |
| Date Analyzed: | 07/08/22 | Data File: | 207046-03.134 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | WE |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 4.07 |
| Barium | 92.3 |
| Cadmium | <1 |
| Chromium | 8.53 |
| Lead | 10.1 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Vertex |
| Date Received: | NA | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/08/22 | Lab ID: | I2-463 mb |
| Date Analyzed: | 07/08/22 | Data File: | I2-463 mb.038 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | WE |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-1 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 207046-01 |
| Date Analyzed: | 07/07/22 | Data File: | 070706.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 94 | 90 | 109 |
| Toluene-d8 | 98 | 89 | 112 |
| 4-Bromofluorobenzene | 102 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-2 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 207046-02 |
| Date Analyzed: | 07/07/22 | Data File: | 070707.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 96 | 90 | 109 |
| Toluene-d8 | 101 | 89 | 112 |
| 4-Bromofluorobenzene | 101 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-3 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 207046-03 |
| Date Analyzed: | 07/07/22 | Data File: | 070708.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 97 | 90 | 109 |
| Toluene-d8 | 101 | 89 | 112 |
| 4-Bromofluorobenzene | 102 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Vertex |
| Date Received: | Not Applicable | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 02-1573 mb |
| Date Analyzed: | 07/07/22 | Data File: | 070705.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 94 | 90 | 109 |
| Toluene-d8 | 99 | 89 | 112 |
| 4-Bromofluorobenzene | 101 | 84 | 115 |

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

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-1 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 207046-01 1/5 |
| Date Analyzed: | 07/11/22 | Data File: | 071116.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 58 | 39 | 103 |
| Phenol-d6 | 67 | 48 | 109 |
| Nitrobenzene-d5 | 74 | 23 | 138 |
| 2-Fluorobiphenyl | 81 | 50 | 150 |
| 2,4,6-Tribromophenol | 88 | 40 | 127 |
| Terphenyl-d14 | 85 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 | Fluorene | <0.01 |
| Hexachloroethane | <0.05 | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-2 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 207046-02 1/25 |
| Date Analyzed: | 07/11/22 | Data File: | 071119.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 41 d | 39 | 103 |
| Phenol-d6 | 52 d | 48 | 109 |
| Nitrobenzene-d5 | 76 d | 23 | 138 |
| 2-Fluorobiphenyl | 88 d | 50 | 150 |
| 2,4,6-Tribromophenol | 89 d | 40 | 127 |
| Terphenyl-d14 | 93 d | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <2.5 | 2,6-Dinitrotoluene | <1.2 |
| Bis(2-chloroethyl) ether | <0.25 | 3-Nitroaniline | <25 |
| 2-Chlorophenol | <2.5 | Acenaphthene | <0.05 |
| 1,3-Dichlorobenzene | <0.25 | 2,4-Dinitrophenol | <7.5 |
| 1,4-Dichlorobenzene | <0.25 | Dibenzofuran | <0.25 |
| 1,2-Dichlorobenzene | <0.25 | 2,4-Dinitrotoluene | <1.2 |
| Benzyl alcohol | <2.5 | 4-Nitrophenol | <7.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.25 | Diethyl phthalate | <2.5 |
| 2-Methylphenol | <2.5 | Fluorene | <0.05 |
| Hexachloroethane | <0.25 | 4-Chlorophenyl phenyl ether | <0.25 |
| N-Nitroso-di-n-propylamine | <0.25 | N-Nitrosodiphenylamine | <0.25 |
| 3-Methylphenol + 4-Methylphenol | <5 | 4-Nitroaniline | <25 |
| Nitrobenzene | <0.25 | 4,6-Dinitro-2-methylphenol | <7.5 |
| Isophorone | <0.25 | 4-Bromophenyl phenyl ether | <0.25 |
| 2-Nitrophenol | <2.5 | Hexachlorobenzene | <0.25 |
| 2,4-Dimethylphenol | <2.5 | Pentachlorophenol | <1.2 |
| Benzoic acid | <12 | Phenanthrene | <0.05 |
| Bis(2-chloroethoxy)methane | <0.25 | Anthracene | <0.05 |
| 2,4-Dichlorophenol | <2.5 | Carbazole | <0.25 |
| 1,2,4-Trichlorobenzene | <0.25 | Di-n-butyl phthalate | <2.5 |
| Naphthalene | <0.05 | Fluoranthene | <0.05 |
| Hexachlorobutadiene | <0.25 | Pyrene | <0.05 |
| 4-Chloroaniline | <25 | Benzyl butyl phthalate | <2.5 |
| 4-Chloro-3-methylphenol | <2.5 | Benz(a)anthracene | <0.05 |
| 2-Methylnaphthalene | <0.05 | Chrysene | <0.05 |
| 1-Methylnaphthalene | <0.05 | Bis(2-ethylhexyl) phthalate | <4 |
| Hexachlorocyclopentadiene | <0.75 | Di-n-octyl phthalate | <2.5 |
| 2,4,6-Trichlorophenol | <2.5 | Benzo(a)pyrene | <0.05 |
| 2,4,5-Trichlorophenol | <2.5 | Benzo(b)fluoranthene | <0.05 |
| 2-Chloronaphthalene | <0.25 | Benzo(k)fluoranthene | <0.05 |
| 2-Nitroaniline | <1.2 | Indeno(1,2,3-cd)pyrene | <0.05 |
| Dimethyl phthalate | <2.5 | Dibenz(a,h)anthracene | <0.05 |
| Acenaphthylene | <0.05 | Benzo(g,h,i)perylene | <0.05 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-3 | Client: | Vertex |
| Date Received: | 07/06/22 | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 207046-03 1/5 |
| Date Analyzed: | 07/11/22 | Data File: | 071117.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 42 | 39 | 103 |
| Phenol-d6 | 51 | 48 | 109 |
| Nitrobenzene-d5 | 61 | 23 | 138 |
| 2-Fluorobiphenyl | 68 | 50 | 150 |
| 2,4,6-Tribromophenol | 77 | 40 | 127 |
| Terphenyl-d14 | 76 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 | Fluorene | <0.01 |
| Hexachloroethane | <0.05 | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | 0.011 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Vertex |
| Date Received: | Not Applicable | Project: | Fredrickson 71555, F&BI 207046 |
| Date Extracted: | 07/07/22 | Lab ID: | 02-1596 mb 1/5 |
| Date Analyzed: | 07/11/22 | Data File: | 071110.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 71 | 39 | 103 |
| Phenol-d6 | 80 | 48 | 109 |
| Nitrobenzene-d5 | 82 | 23 | 138 |
| 2-Fluorobiphenyl | 93 | 50 | 150 |
| 2,4,6-Tribromophenol | 101 | 40 | 127 |
| Terphenyl-d14 | 104 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 | Fluorene | <0.01 |
| Hexachloroethane | <0.05 | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

Date of Report: 07/13/22
Date Received: 07/06/22
Project: Fredrickson 71555, F&BI 207046

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

Laboratory Code: 206500-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | mg/kg (ppm) | 20 | 115 | 71-131 |

Date of Report: 07/13/22
Date Received: 07/06/22
Project: Fredrickson 71555, F&BI 207046

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

Laboratory Code: 206500-10 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet Wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | 57 | 100 | 95 | 73-135 | 5 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | 102 | 74-139 |

Date of Report: 07/13/22
Date Received: 07/06/22
Project: Fredrickson 71555, F&BI 207046

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

Laboratory Code: 206500-02 x5 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | <5 | 71 vo | 76 | 75-125 | 7 |
| Barium | mg/kg (ppm) | 50 | 34.4 | 85 | 81 | 75-125 | 5 |
| Cadmium | mg/kg (ppm) | 10 | <5 | 93 | 88 | 75-125 | 6 |
| Chromium | mg/kg (ppm) | 50 | 10.9 | 77 | 77 | 75-125 | 0 |
| Lead | mg/kg (ppm) | 50 | <5 | 94 | 89 | 75-125 | 5 |
| Mercury | mg/kg (ppm | 5 | <5 | 94 | 93 | 75-125 | 1 |
| Selenium | mg/kg (ppm) | 5 | <5 | 75 | 78 | 75-125 | 4 |
| Silver | mg/kg (ppm) | 10 | <5 | 72 vo | 88 | 75-125 | 20 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 91 | 80-120 |
| Barium | mg/kg (ppm) | 50 | 95 | 80-120 |
| Cadmium | mg/kg (ppm) | 10 | 95 | 80-120 |
| Chromium | mg/kg (ppm) | 50 | 92 | 80-120 |
| Lead | mg/kg (ppm) | 50 | 98 | 80-120 |
| Mercury | mg/kg (ppm) | 5 | 96 | 80-120 |
| Selenium | mg/kg (ppm) | 5 | 94 | 80-120 |
| Silver | mg/kg (ppm) | 10 | 96 | 80-120 |

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Project: Fredrickson 71555, F&BI 207046

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

Laboratory Code: 206513-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 1 | <0.5 | 17 | 12 | 10-142 | 34 vo |
| Chloromethane | mg/kg (ppm) | 1 | <0.5 | 38 | 32 | 10-126 | 17 |
| Vinyl chloride | mg/kg (ppm) | 1 | <0.05 | 41 | 32 | 10-138 | 25 vo |
| Bromomethane | mg/kg (ppm) | 1 | <0.5 | 67 | 49 | 10-163 | 31 vo |
| Chloroethane | mg/kg (ppm) | 1 | <0.5 | 55 | 42 | 10-176 | 27 vo |
| Trichlorofluoromethane | mg/kg (ppm) | 1 | <0.5 | 46 | 33 | 10-176 | 33 vo |
| Acetone | mg/kg (ppm) | 5 | <5 | 61 | 48 | 10-163 | 24 vo |
| 1,1-Dichloroethene | mg/kg (ppm) | 1 | <0.05 | 53 | 41 | 10-160 | 26 vo |
| Hexane | mg/kg (ppm) | 1 | <0.25 | 38 | 28 | 10-137 | 30 vo |
| Methylene chloride | mg/kg (ppm) | 1 | <0.5 | 78 | 55 | 10-156 | 35 vo |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 1 | <0.05 | 62 | 48 | 21-145 | 25 vo |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 1 | <0.05 | 58 | 45 | 14-137 | 25 vo |
| 1,1-Dichloroethane | mg/kg (ppm) | 1 | <0.05 | 57 | 44 | 19-140 | 26 vo |
| 2,2-Dichloropropane | mg/kg (ppm) | 1 | <0.05 | 83 | 61 | 10-158 | 31 vo |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 1 | <0.05 | 64 | 50 | 25-135 | 25 vo |
| Chloroform | mg/kg (ppm) | 1 | <0.05 | 46 | 30 | 21-145 | 42 vo |
| 2-Butanone (MEK) | mg/kg (ppm) | 5 | <1 | 62 | 52 | 19-147 | 18 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 1 | <0.05 | 61 | 48 | 12-160 | 24 vo |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 1 | <0.05 | 58 | 45 | 10-156 | 25 vo |
| 1,1-Dichloropropene | mg/kg (ppm) | 1 | <0.05 | 55 | 42 | 17-140 | 27 vo |
| Carbon tetrachloride | mg/kg (ppm) | 1 | <0.05 | 56 | 43 | 9-164 | 26 vo |
| Benzene | mg/kg (ppm) | 1 | <0.03 | 61 | 48 | 29-129 | 24 vo |
| Trichloroethene | mg/kg (ppm) | 1 | <0.02 | 55 | 42 | 21-139 | 27 vo |
| 1,2-Dichloropropane | mg/kg (ppm) | 1 | <0.05 | 60 | 49 | 30-135 | 20 |
| Bromodichloromethane | mg/kg (ppm) | 1 | <0.05 | 61 | 48 | 23-155 | 24 vo |
| Dibromomethane | mg/kg (ppm) | 1 | <0.05 | 67 | 52 | 23-145 | 25 vo |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 5 | <1 | 68 | 56 | 24-155 | 19 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 1 | <0.05 | 66 | 52 | 28-144 | 24 vo |
| Toluene | mg/kg (ppm) | 1 | <0.05 | 62 | 50 | 35-130 | 21 vo |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 1 | <0.05 | 68 | 53 | 26-149 | 25 vo |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 1 | <0.05 | 77 | 57 | 10-205 | 30 vo |
| 2-Hexanone | mg/kg (ppm) | 5 | <0.5 | 66 | 55 | 15-166 | 18 |
| 1,3-Dichloropropane | mg/kg (ppm) | 1 | <0.05 | 65 | 53 | 31-137 | 20 |
| Tetrachloroethene | mg/kg (ppm) | 1 | <0.025 | 57 | 45 | 20-133 | 24 vo |
| Dibromochloromethane | mg/kg (ppm) | 1 | <0.05 | 74 | 56 | 28-150 | 28 vo |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 1 | <0.05 | 67 | 52 | 28-142 | 25 vo |
| Chlorobenzene | mg/kg (ppm) | 1 | <0.05 | 67 | 53 | 32-129 | 23 vo |
| Ethylbenzene | mg/kg (ppm) | 1 | <0.05 | 59 | 48 | 32-137 | 21 vo |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 1 | <0.05 | 69 | 52 | 31-143 | 28 vo |
| m,p-Xylene | mg/kg (ppm) | 2 | <0.1 | 60 | 49 | 34-136 | 20 |
| o-Xylene | mg/kg (ppm) | 1 | <0.05 | 63 | 48 | 33-134 | 27 vo |
| Styrene | mg/kg (ppm) | 1 | <0.05 | 65 | 51 | 35-137 | 24 vo |
| Isopropylbenzene | mg/kg (ppm) | 1 | <0.05 | 59 | 46 | 31-142 | 25 vo |
| Bromoform | mg/kg (ppm) | 1 | <0.05 | 76 | 59 | 21-156 | 25 vo |
| n-Propylbenzene | mg/kg (ppm) | 1 | <0.05 | 57 | 46 | 23-146 | 21 vo |
| Bromobenzene | mg/kg (ppm) | 1 | <0.05 | 66 | 55 | 34-130 | 18 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 1 | 0.048 | 52 | 42 | 18-149 | 21 vo |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 1 | <0.05 | 109 | 81 | 28-140 | 29 vo |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 1 | <0.05 | 69 | 56 | 25-144 | 21 vo |
| 2-Chlorotoluene | mg/kg (ppm) | 1 | <0.05 | 62 | 49 | 31-134 | 23 vo |
| 4-Chlorotoluene | mg/kg (ppm) | 1 | <0.05 | 61 | 50 | 31-136 | 20 |
| tert-Butylbenzene | mg/kg (ppm) | 1 | <0.05 | 57 | 47 | 30-137 | 19 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 1 | 0.080 | 52 | 41 | 10-182 | 24 vo |
| sec-Butylbenzene | mg/kg (ppm) | 1 | 0.17 | 52 | 37 | 23-145 | 34 vo |
| p-Isopropyltoluene | mg/kg (ppm) | 1 | 0.15 | 52 | 38 | 21-149 | 31 vo |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 1 | <0.05 | 63 | 51 | 30-131 | 21 vo |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 1 | <0.05 | 64 | 51 | 29-129 | 23 vo |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 1 | <0.05 | 66 | 53 | 31-132 | 22 vo |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 1 | <0.5 | 63 | 54 | 11-161 | 15 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 1 | <0.25 | 65 | 50 | 22-142 | 26 vo |
| Hexachlorobutadiene | mg/kg (ppm) | 1 | <0.25 | 61 | 46 | 10-142 | 28 vo |
| Naphthalene | mg/kg (ppm) | 1 | <0.05 | 76 | 59 | 14-157 | 25 vo |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 1 | <0.25 | 66 | 51 | 20-144 | 26 vo |

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

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 1 | 56 | 10-146 |
| Chloromethane | mg/kg (ppm) | 1 | 65 | 27-133 |
| Vinyl chloride | mg/kg (ppm) | 1 | 77 | 22-139 |
| Bromomethane | mg/kg (ppm) | 1 | 106 | 38-114 |
| Chloroethane | mg/kg (ppm) | 1 | 88 | 9-163 |
| Trichlorofluoromethane | mg/kg (ppm) | 1 | 91 | 10-196 |
| Acetone | mg/kg (ppm) | 5 | 86 | 52-141 |
| 1,1-Dichloroethene | mg/kg (ppm) | 1 | 84 | 47-128 |
| Hexane | mg/kg (ppm) | 1 | 93 | 43-142 |
| Methylene chloride | mg/kg (ppm) | 1 | 79 | 10-184 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 1 | 80 | 60-123 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 1 | 84 | 67-129 |
| 1,1-Dichloroethane | mg/kg (ppm) | 1 | 80 | 68-115 |
| 2,2-Dichloropropane | mg/kg (ppm) | 1 | 115 | 52-170 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 1 | 86 | 72-127 |
| Chloroform | mg/kg (ppm) | 1 | 67 | 66-120 |
| 2-Butanone (MEK) | mg/kg (ppm) | 5 | 85 | 30-197 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 1 | 81 | 56-135 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 1 | 86 | 62-131 |
| 1,1-Dichloropropene | mg/kg (ppm) | 1 | 81 | 69-128 |
| Carbon tetrachloride | mg/kg (ppm) | 1 | 86 | 60-139 |
| Benzene | mg/kg (ppm) | 1 | 86 | 71-118 |
| Trichloroethene | mg/kg (ppm) | 1 | 77 | 63-121 |
| 1,2-Dichloropropane | mg/kg (ppm) | 1 | 82 | 72-127 |
| Bromodichloromethane | mg/kg (ppm) | 1 | 81 | 57-126 |
| Dibromomethane | mg/kg (ppm) | 1 | 87 | 62-123 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 5 | 87 | 45-145 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 1 | 88 | 67-122 |
| Toluene | mg/kg (ppm) | 1 | 91 | 66-126 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 1 | 88 | 72-132 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 1 | 93 | 64-115 |
| 2-Hexanone | mg/kg (ppm) | 5 | 90 | 33-152 |
| 1,3-Dichloropropane | mg/kg (ppm) | 1 | 88 | 72-130 |
| Tetrachloroethene | mg/kg (ppm) | 1 | 91 | 72-114 |
| Dibromochloromethane | mg/kg (ppm) | 1 | 94 | 55-121 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 1 | 91 | 74-132 |
| Chlorobenzene | mg/kg (ppm) | 1 | 93 | 76-111 |
| Ethylbenzene | mg/kg (ppm) | 1 | 89 | 64-123 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 1 | 88 | 64-121 |
| m,p-Xylene | mg/kg (ppm) | 2 | 91 | 78-122 |
| o-Xylene | mg/kg (ppm) | 1 | 87 | 77-124 |
| Styrene | mg/kg (ppm) | 1 | 89 | 74-126 |
| Isopropylbenzene | mg/kg (ppm) | 1 | 89 | 76-127 |
| Bromoform | mg/kg (ppm) | 1 | 97 | 56-132 |
| n-Propylbenzene | mg/kg (ppm) | 1 | 94 | 74-124 |
| Bromobenzene | mg/kg (ppm) | 1 | 94 | 72-122 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 1 | 89 | 76-126 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 1 | 105 | 56-143 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 1 | 93 | 61-137 |
| 2-Chlorotoluene | mg/kg (ppm) | 1 | 92 | 74-121 |
| 4-Chlorotoluene | mg/kg (ppm) | 1 | 91 | 75-122 |
| tert-Butylbenzene | mg/kg (ppm) | 1 | 94 | 73-130 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 1 | 89 | 76-125 |
| sec-Butylbenzene | mg/kg (ppm) | 1 | 93 | 71-130 |
| p-Isopropyltoluene | mg/kg (ppm) | 1 | 94 | 70-132 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 1 | 93 | 75-121 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 1 | 94 | 74-117 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 1 | 92 | 76-121 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 1 | 83 | 58-138 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 1 | 91 | 64-135 |
| Hexachlorobutadiene | mg/kg (ppm) | 1 | 95 | 50-153 |
| Naphthalene | mg/kg (ppm) | 1 | 87 | 63-140 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 1 | 91 | 63-138 |

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

Laboratory Code: 207063-04 1/5 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Phenol | mg/kg (ppm) | 0.83 | <0.5 | 66 | 66 | 50-150 | 0 |
| Bis(2-chloroethyl) ether | mg/kg (ppm) | 0.83 | <0.05 | 74 | 70 | 50-150 | 6 |
| 2-Chlorophenol | mg/kg (ppm) | 0.83 | <0.5 | 74 | 72 | 50-150 | 3 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 0.83 | <0.05 | 75 | 70 | 50-150 | 7 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 0.83 | <0.05 | 74 | 70 | 50-150 | 6 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 0.83 | <0.05 | 74 | 70 | 50-150 | 6 |
| Benzyl alcohol | mg/kg (ppm) | 4.2 | <0.5 | 80 | 77 | 50-150 | 4 |
| 2,2'-Oxybis(1-chloropropane) | mg/kg (ppm) | 0.83 | <0.05 | 77 | 72 | 50-150 | 7 |
| 2-Methylphenol | mg/kg (ppm) | 0.83 | <0.5 | 63 | 59 | 50-150 | 7 |
| Hexachloroethane | mg/kg (ppm) | 0.83 | <0.05 | 72 | 68 | 50-150 | 6 |
| N-Nitroso-di-n-propylamine | mg/kg (ppm) | 0.83 | <0.05 | 80 | 78 | 50-150 | 3 |
| 3-Methylphenol + 4-Methylphenol | mg/kg (ppm) | 0.83 | <1 | 65 | 61 | 50-150 | 6 |
| Nitrobenzene | mg/kg (ppm) | 0.83 | <0.05 | 77 | 77 | 50-150 | 0 |
| Isophorone | mg/kg (ppm) | 0.83 | <0.05 | 82 | 81 | 50-150 | 1 |
| 2-Nitrophenol | mg/kg (ppm) | 0.83 | <0.5 | 83 | 83 | 50-150 | 0 |
| 2,4-Dimethylphenol | mg/kg (ppm) | 0.83 | <0.5 | 32 vo | 27 vo | 50-150 | 17 |
| Benzoic acid | mg/kg (ppm) | 2.5 | <2.5 | 48 vo | 45 vo | 50-150 | 6 |
| Bis(2-chloroethoxy)methane | mg/kg (ppm) | 0.83 | <0.05 | 83 | 82 | 50-150 | 1 |
| 2,4-Dichlorophenol | mg/kg (ppm) | 0.83 | <0.5 | 78 | 78 | 50-150 | 0 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 0.83 | <0.05 | 78 | 76 | 50-150 | 3 |
| Naphthalene | mg/kg (ppm) | 0.83 | <0.01 | 65 | 63 | 50-150 | 3 |
| Hexachlorobutadiene | mg/kg (ppm) | 0.83 | <0.05 | 80 | 77 | 50-150 | 4 |
| 4-Chloroaniline | mg/kg (ppm) | 4.2 | <5 | 72 | 70 | 50-150 | 3 |
| 4-Chloro-3-methylphenol | mg/kg (ppm) | 0.83 | <0.5 | 81 | 78 | 50-150 | 4 |
| 2-Methylnaphthalene | mg/kg (ppm) | 0.83 | <0.01 | 69 | 68 | 50-150 | 1 |
| 1-Methylnaphthalene | mg/kg (ppm) | 0.83 | <0.01 | 68 | 67 | 50-150 | 1 |
| Hexachlorocyclopentadiene | mg/kg (ppm) | 0.83 | <0.15 | 88 | 90 | 50-150 | 2 |
| 2,4,6-Trichlorophenol | mg/kg (ppm) | 0.83 | <0.5 | 82 | 81 | 50-150 | 1 |
| 2,4,5-Trichlorophenol | mg/kg (ppm) | 0.83 | <0.5 | 85 | 85 | 50-150 | 0 |
| 2-Chloronaphthalene | mg/kg (ppm) | 0.83 | <0.05 | 83 | 81 | 50-150 | 2 |
| 2-Nitroaniline | mg/kg (ppm) | 4.2 | <0.25 | 90 | 89 | 50-150 | 1 |
| Dimethyl phthalate | mg/kg (ppm) | 0.83 | <0.5 | 87 | 86 | 50-150 | 1 |
| Acenaphthylene | mg/kg (ppm) | 0.83 | <0.01 | 73 | 73 | 50-150 | 0 |
| 2,6-Dinitrotoluene | mg/kg (ppm) | 0.83 | <0.25 | 88 | 87 | 50-150 | 1 |
| 3-Nitroaniline | mg/kg (ppm) | 4.2 | <5 | 87 | 85 | 50-150 | 2 |
| Acenaphthene | mg/kg (ppm) | 0.83 | <0.01 | 71 | 70 | 50-150 | 1 |
| 2,4-Dinitrophenol | mg/kg (ppm) | 1.7 | <1.5 | 92 | 87 | 50-150 | 6 |
| Dibenzofuran | mg/kg (ppm) | 0.83 | <0.05 | 73 | 72 | 50-150 | 1 |
| 2,4-Dinitrotoluene | mg/kg (ppm) | 0.83 | <0.25 | 90 | 90 | 50-150 | 0 |
| 4-Nitrophenol | mg/kg (ppm) | 1.7 | <1.5 | 84 | 85 | 50-150 | 1 |
| Diethyl phthalate | mg/kg (ppm) | 0.83 | <0.5 | 87 | 87 | 50-150 | 0 |
| Fluorene | mg/kg (ppm) | 0.83 | <0.01 | 75 | 75 | 50-150 | 0 |
| 4-Chlorophenyl phenyl ether | mg/kg (ppm) | 0.83 | <0.05 | 86 | 85 | 50-150 | 1 |
| N-Nitrosodiphenylamine | mg/kg (ppm) | 0.83 | <0.05 | 67 | 60 | 50-150 | 11 |
| 4-Nitroaniline | mg/kg (ppm) | 4.2 | <5 | 83 | 77 | 50-150 | 7 |
| 4,6-Dinitro-2-methylphenol | mg/kg (ppm) | 0.83 | <1.5 | 107 | 101 | 50-150 | 6 |
| 4-Bromophenyl phenyl ether | mg/kg (ppm) | 0.83 | <0.05 | 88 | 84 | 50-150 | 5 |
| Hexachlorobenzene | mg/kg (ppm) | 0.83 | <0.05 | 88 | 82 | 50-150 | 7 |
| Pentachlorophenol | mg/kg (ppm) | 0.83 | <0.25 | 92 | 83 | 50-150 | 10 |
| Phenanthrene | mg/kg (ppm) | 0.83 | <0.01 | 76 | 71 | 50-150 | 7 |
| Anthracene | mg/kg (ppm) | 0.83 | <0.01 | 77 | 71 | 50-150 | 8 |
| Carbazole | mg/kg (ppm) | 0.83 | <0.05 | 82 | 77 | 50-150 | 6 |
| Di-n-butyl phthalate | mg/kg (ppm) | 0.83 | <0.5 | 97 | 95 | 50-150 | 2 |
| Fluoranthene | mg/kg (ppm) | 0.83 | <0.01 | 82 | 78 | 50-150 | 5 |
| Pyrene | mg/kg (ppm) | 0.83 | <0.01 | 76 | 74 | 50-150 | 3 |
| Benzyl butyl phthalate | mg/kg (ppm) | 0.83 | <0.5 | 96 | 95 | 50-150 | 1 |
| Benz(a)anthracene | mg/kg (ppm) | 0.83 | <0.01 | 78 | 76 | 50-150 | 3 |
| Chrysene | mg/kg (ppm) | 0.83 | <0.01 | 76 | 75 | 50-150 | 1 |
| Bis(2-ethylhexyl) phthalate | mg/kg (ppm) | 0.83 | <0.8 | 84 | 87 | 50-150 | 4 |
| Di-n-octyl phthalate | mg/kg (ppm) | 0.83 | <0.5 | 101 | 100 | 50-150 | 1 |
| Benzo(a)pyrene | mg/kg (ppm) | 0.83 | <0.01 | 79 | 77 | 50-150 | 3 |
| Benzo(b)fluoranthene | mg/kg (ppm) | 0.83 | <0.01 | 78 | 75 | 50-150 | 4 |
| Benzo(k)fluoranthene | mg/kg (ppm) | 0.83 | <0.01 | 78 | 76 | 50-150 | 3 |
| Indeno(1,2,3-cd)pyrene | mg/kg (ppm) | 0.83 | <0.01 | 88 | 86 | 50-150 | 2 |
| Dibenz(a,h)anthracene | mg/kg (ppm) | 0.83 | <0.01 | 90 | 89 | 50-150 | 1 |
| Benzo(g,h,i)perylene | mg/kg (ppm) | 0.83 | <0.01 | 83 | 82 | 50-150 | 1 |

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

Laboratory Code: Laboratory Control Sample 1/5

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Phenol | mg/kg (ppm) | 0.83 | 67 | 64-106 |
| Bis(2-chloroethyl) ether | mg/kg (ppm) | 0.83 | 71 | 60-96 |
| 2-Chlorophenol | mg/kg (ppm) | 0.83 | 73 | 63-103 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 0.83 | 71 | 58-100 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 0.83 | 70 | 59-100 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 0.83 | 70 | 60-101 |
| Benzyl alcohol | mg/kg (ppm) | 4.2 | 77 | 62-106 |
| 2,2'-Oxybis(1-chloropropane) | mg/kg (ppm) | 0.83 | 72 | 58-97 |
| 2-Methylphenol | mg/kg (ppm) | 0.83 | 75 | 62-107 |
| Hexachloroethane | mg/kg (ppm) | 0.83 | 69 | 59-102 |
| N-Nitroso-di-n-propylamine | mg/kg (ppm) | 0.83 | 79 | 64-112 |
| 3-Methylphenol + 4-Methylphenol | mg/kg (ppm) | 0.83 | 75 | 63-110 |
| Nitrobenzene | mg/kg (ppm) | 0.83 | 76 | 56-98 |
| Isophorone | mg/kg (ppm) | 0.83 | 82 | 62-111 |
| 2-Nitrophenol | mg/kg (ppm) | 0.83 | 81 | 64-112 |
| 2,4-Dimethylphenol | mg/kg (ppm) | 0.83 | 72 | 31-105 |
| Benzoic acid | mg/kg (ppm) | 2.5 | 74 | 46-88 |
| Bis(2-chloroethoxy)methane | mg/kg (ppm) | 0.83 | 82 | 64-103 |
| 2,4-Dichlorophenol | mg/kg (ppm) | 0.83 | 79 | 62-112 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 0.83 | 74 | 61-104 |
| Naphthalene | mg/kg (ppm) | 0.83 | 63 | 61-102 |
| Hexachlorobutadiene | mg/kg (ppm) | 0.83 | 76 | 54-97 |
| 4-Chloroaniline | mg/kg (ppm) | 4.2 | 70 | 50-100 |
| 4-Chloro-3-methylphenol | mg/kg (ppm) | 0.83 | 87 | 63-116 |
| 2-Methylnaphthalene | mg/kg (ppm) | 0.83 | 68 | 62-108 |
| 1-Methylnaphthalene | mg/kg (ppm) | 0.83 | 67 | 62-108 |
| Hexachlorocyclopentadiene | mg/kg (ppm) | 0.83 | 91 | 58-125 |
| 2,4,6-Trichlorophenol | mg/kg (ppm) | 0.83 | 87 | 61-114 |
| 2,4,5-Trichlorophenol | mg/kg (ppm) | 0.83 | 88 | 64-121 |
| 2-Chloronaphthalene | mg/kg (ppm) | 0.83 | 83 | 62-112 |
| 2-Nitroaniline | mg/kg (ppm) | 4.2 | 92 | 30-179 |
| Dimethyl phthalate | mg/kg (ppm) | 0.83 | 92 | 63-124 |
| Acenaphthylene | mg/kg (ppm) | 0.83 | 75 | 61-111 |
| 2,6-Dinitrotoluene | mg/kg (ppm) | 0.83 | 91 | 64-124 |
| 3-Nitroaniline | mg/kg (ppm) | 4.2 | 89 | 57-114 |
| Acenaphthene | mg/kg (ppm) | 0.83 | 73 | 61-110 |
| 2,4-Dinitrophenol | mg/kg (ppm) | 1.7 | 103 | 66-131 |
| Dibenzofuran | mg/kg (ppm) | 0.83 | 75 | 65-118 |
| 2,4-Dinitrotoluene | mg/kg (ppm) | 0.83 | 94 | 47-146 |
| 4-Nitrophenol | mg/kg (ppm) | 1.7 | 90 | 66-121 |
| Diethyl phthalate | mg/kg (ppm) | 0.83 | 91 | 63-124 |
| Fluorene | mg/kg (ppm) | 0.83 | 77 | 62-114 |
| 4-Chlorophenyl phenyl ether | mg/kg (ppm) | 0.83 | 89 | 61-116 |
| N-Nitrosodiphenylamine | mg/kg (ppm) | 0.83 | 90 | 64-116 |
| 4-Nitroaniline | mg/kg (ppm) | 4.2 | 84 | 63-117 |
| 4,6-Dinitro-2-methylphenol | mg/kg (ppm) | 0.83 | 113 | 74-140 |
| 4-Bromophenyl phenyl ether | mg/kg (ppm) | 0.83 | 92 | 66-118 |
| Hexachlorobenzene | mg/kg (ppm) | 0.83 | 91 | 58-108 |
| Pentachlorophenol | mg/kg (ppm) | 0.83 | 89 | 66-130 |
| Phenanthrene | mg/kg (ppm) | 0.83 | 79 | 64-112 |
| Anthracene | mg/kg (ppm) | 0.83 | 80 | 63-111 |
| Carbazole | mg/kg (ppm) | 0.83 | 83 | 68-120 |
| Di-n-butyl phthalate | mg/kg (ppm) | 0.83 | 98 | 52-130 |
| Fluoranthene | mg/kg (ppm) | 0.83 | 85 | 66-115 |
| Pyrene | mg/kg (ppm) | 0.83 | 82 | 65-112 |
| Benzyl butyl phthalate | mg/kg (ppm) | 0.83 | 95 | 56-131 |
| Benz(a)anthracene | mg/kg (ppm) | 0.83 | 81 | 64-116 |
| Chrysene | mg/kg (ppm) | 0.83 | 81 | 66-119 |
| Bis(2-ethylhexyl) phthalate | mg/kg (ppm) | 0.83 | 85 | 66-124 |
| Di-n-octyl phthalate | mg/kg (ppm) | 0.83 | 97 | 62-120 |
| Benzo(a)pyrene | mg/kg (ppm) | 0.83 | 84 | 62-116 |
| Benzo(b)fluoranthene | mg/kg (ppm) | 0.83 | 82 | 61-118 |
| Benzo(k)fluoranthene | mg/kg (ppm) | 0.83 | 83 | 65-119 |
| Indeno(1,2,3-cd)pyrene | mg/kg (ppm) | 0.83 | 97 | 64-130 |
| Dibenz(a,h)anthracene | mg/kg (ppm) | 0.83 | 100 | 67-131 |
| Benzo(g,h,i)perylene | mg/kg (ppm) | 0.83 | 95 | 67-126 |

# Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

# SAMPLE CHAIN OF CUSTODY

7/6/22 DOJ/USAT

Page # 1 of 1

2207046

Report To Jason Cass

Company Vertex

Address 810 3rd Ave, Suite 307

City, State, ZIP Seattle, WA 98104

Phone 206-429-6200 Email jcass@vertexeng.com

SAMPLERS (*signature*): Allison Eng

PROJECT NAME: Fredrickson

PO #: 71555

REMARKS: Project specific RLs? - Yes / No

INVOICE TO

TURNAROUND TIME
- ☑ Standard turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | RCRA Metals | SVOCs | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ANALYSES REQUESTED | | | | | | | | | | | |
| Comp-1 | 01 A-E | 7/5/22 | 1550 | Soil | 5 | X | X | | | X | | X | X | X | | | Hold PCBs |
| Comp-2 | 02 | ↓ | 1710 | ↓ | ↓ | ↓ | ↓ | | | ↓ | | ↓ | ↓ | ↓ | | | Hold PCBs |
| Comp-3 | 03 | ↓ | 1720 | ↓ | ↓ | ↓ | ↓ | | | ↓ | | ↓ | ↓ | ↓ | | | Hold PCBs |
| | | | | | | | | | | | | | | | | | |
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| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | K. Norsworthy | VERTEX | 7/6/22 | 9:20 |
| Received by: W. Madden | W. Madden | F+BI | 7/6/22 | 0919 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 3 °C | | |

*Friedman & Bruya, Inc.*
*Ph. (206) 285-8282*

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 19, 2022

Jason Cass, Project Manager
Vertex
810 3rd Ave, Suite 307
Seattle, WA 98104

Dear Mr Cass:

Included are the results from the testing of material submitted on July 7, 2022 from the Fredrickson 71555, F&BI 207101 project. There are 38 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
VTX0719R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 7, 2022 by Friedman & Bruya, Inc. from the Vertex Fredrickson 71555, F&BI 207101 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Vertex |
|---|---|
| 207101 -01 | Comp-4 |
| 207101 -02 | Comp-5 |
| 207101 -03 | Comp-6 |
| 207101 -04 | Comp-7 |
| 207101 -05 | Comp-8 |
| 207101 -06 | Comp-9 |
| 207101 -07 | Comp-10 |
| 207101 -08 | Comp-11 |

The 8260D calibration standard failed the acceptance criteria for chloroform. The data were flagged accordingly.

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

Several compounds in the 8270E laboratory control sample and laboratory control sample duplicate failed the acceptance criteria. The data were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 07/19/22
Date Received: 07/07/22
Project: Fredrickson 71555, F&BI 207101
Date Extracted: 07/13/22
Date Analyzed: 07/14/22

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

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

| Sample ID<br>Laboratory ID | Gasoline Range | Surrogate<br>(% Recovery)<br>(Limit 58-139) |
|---|---|---|
| Comp-4<br>207101-01 | <5 | 83 |
| Comp-5<br>207101-02 | <5 | 76 |
| Comp-6<br>207101-03 | <5 | 77 |
| Comp-7<br>207101-04 | <5 | 77 |
| Comp-8<br>207101-05 | <5 | 78 |
| Comp-9<br>207101-06 | <5 | 73 |
| Comp-10<br>207101-07 | <5 | 76 |
| Comp-11<br>207101-08 | <5 | 77 |
| Method Blank<br>02-1558 MB2 | <5 | 77 |

Date of Report: 07/19/22
Date Received: 07/07/22
Project: Fredrickson 71555, F&BI 207101
Date Extracted: 07/08/22
Date Analyzed: 07/08/22

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

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

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate<br>(% Recovery)<br>(Limit 48-168) |
|---|---|---|---|
| Comp-4<br>207101-01 | <50 | <250 | 80 |
| Comp-5<br>207101-02 | <50 | <250 | 89 |
| Comp-6<br>207101-03 | <50 | <250 | 88 |
| Comp-7<br>207101-04 | <50 | <250 | 84 |
| Comp-8<br>207101-05 | <50 | <250 | 84 |
| Comp-9<br>207101-06 | <50 | <250 | 82 |
| Comp-10<br>207101-07 | <50 | <250 | 81 |
| Comp-11<br>207101-08 | <50 | <250 | 82 |
| Method Blank<br>02-1605 MB | <50 | <250 | 86 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-4 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-01 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-01.142 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.27 |
| Barium | 46.1 |
| Cadmium | <1 |
| Chromium | 9.03 |
| Lead | 5.67 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-5 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-02 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-02.159 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.47 |
| Barium | 54.2 |
| Cadmium | <1 |
| Chromium | 8.26 |
| Lead | 7.88 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-6 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-03 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-03.160 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.58 |
| Barium | 70.6 |
| Cadmium | <1 |
| Chromium | 8.89 |
| Lead | 11.4 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-7 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-04 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-04.161 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.50 |
| Barium | 64.1 |
| Cadmium | <1 |
| Chromium | 9.05 |
| Lead | 6.27 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-8 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-05 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-05.162 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.38 |
| Barium | 66.3 |
| Cadmium | <1 |
| Chromium | 12.5 |
| Lead | 6.73 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-9 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-06 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-06.163 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.34 |
| Barium | 63.9 |
| Cadmium | <1 |
| Chromium | 14.4 |
| Lead | 5.44 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-10 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-07 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-07.166 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.95 |
| Barium | 79.2 |
| Cadmium | <1 |
| Chromium | 13.2 |
| Lead | 7.89 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Comp-11 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | 207101-08 |
| Date Analyzed: | 07/12/22 | Data File: | 207101-08.167 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.74 |
| Barium | 73.7 |
| Cadmium | <1 |
| Chromium | 12.8 |
| Lead | 7.09 |
| Mercury | <1 |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Vertex |
| Date Received: | NA | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/12/22 | Lab ID: | I2-473 mb |
| Date Analyzed: | 07/12/22 | Data File: | I2-473 mb.132 |
| Matrix: | Soil | Instrument: | ICPMS2 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-4 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-01 |
| Date Analyzed: | 07/12/22 | Data File: | 071239.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 92 | 90 | 109 |
| Toluene-d8 | 101 | 89 | 112 |
| 4-Bromofluorobenzene | 97 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-4 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-01 |
| Date Analyzed: | 07/11/22 | Data File: | 071128.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

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

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| 1,2-Dibromo-3-chloropropane | <0.5 |

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-5 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-02 |
| Date Analyzed: | 07/11/22 | Data File: | 071129.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 95 | 90 | 109 |
| Toluene-d8 | 101 | 89 | 112 |
| 4-Bromofluorobenzene | 103 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-6 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-03 |
| Date Analyzed: | 07/11/22 | Data File: | 071130.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 98 | 90 | 109 |
| Toluene-d8 | 100 | 89 | 112 |
| 4-Bromofluorobenzene | 97 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-7 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-04 |
| Date Analyzed: | 07/11/22 | Data File: | 071131.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 91 | 90 | 109 |
| Toluene-d8 | 100 | 89 | 112 |
| 4-Bromofluorobenzene | 100 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-8 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-05 |
| Date Analyzed: | 07/11/22 | Data File: | 071132.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 94 | 90 | 109 |
| Toluene-d8 | 101 | 89 | 112 |
| 4-Bromofluorobenzene | 102 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-9 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-06 |
| Date Analyzed: | 07/11/22 | Data File: | 071133.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 98 | 90 | 109 |
| Toluene-d8 | 100 | 89 | 112 |
| 4-Bromofluorobenzene | 101 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-10 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-07 |
| Date Analyzed: | 07/11/22 | Data File: | 071134.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 93 | 90 | 109 |
| Toluene-d8 | 104 | 89 | 112 |
| 4-Bromofluorobenzene | 100 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-11 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 207101-08 |
| Date Analyzed: | 07/11/22 | Data File: | 071135.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 96 | 90 | 109 |
| Toluene-d8 | 100 | 89 | 112 |
| 4-Bromofluorobenzene | 99 | 84 | 115 |

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

## Analysis For Volatile Compounds By EPA Method 8260D

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Vertex |
| Date Received: | Not Applicable | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/11/22 | Lab ID: | 02-1581 mb |
| Date Analyzed: | 07/11/22 | Data File: | 071120.D |
| Matrix: | Soil | Instrument: | GCMS4 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | RF |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 96 | 90 | 109 |
| Toluene-d8 | 101 | 89 | 112 |
| 4-Bromofluorobenzene | 103 | 84 | 115 |

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

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-4 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-01 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071215.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 67 | 39 | 103 |
| Phenol-d6 | 78 | 48 | 109 |
| Nitrobenzene-d5 | 81 | 23 | 138 |
| 2-Fluorobiphenyl | 91 | 50 | 150 |
| 2,4,6-Tribromophenol | 103 | 40 | 127 |
| Terphenyl-d14 | 103 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-4 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-01 1/25 |
| Date Analyzed: | 07/13/22 | Data File: | 071308.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 69 d | 39 | 103 |
| Phenol-d6 | 80 d | 48 | 109 |
| Nitrobenzene-d5 | 84 d | 23 | 138 |
| 2-Fluorobiphenyl | 90 d | 50 | 150 |
| 2,4,6-Tribromophenol | 79 d | 40 | 127 |
| Terphenyl-d14 | 97 d | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <2.5 | 2,6-Dinitrotoluene | <1.2 |
| Bis(2-chloroethyl) ether | <0.25 | 3-Nitroaniline | <25 |
| 2-Chlorophenol | <2.5 | Acenaphthene | <0.05 |
| 1,3-Dichlorobenzene | <0.25 | 2,4-Dinitrophenol | <7.5 |
| 1,4-Dichlorobenzene | <0.25 | Dibenzofuran | <0.25 |
| 1,2-Dichlorobenzene | <0.25 jl | 2,4-Dinitrotoluene | <1.2 |
| Benzyl alcohol | <2.5 | 4-Nitrophenol | <7.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.25 | Diethyl phthalate | <2.5 |
| 2-Methylphenol | <2.5 jl | Fluorene | <0.05 |
| Hexachloroethane | <0.25 jl | 4-Chlorophenyl phenyl ether | <0.25 |
| N-Nitroso-di-n-propylamine | <0.25 | N-Nitrosodiphenylamine | <0.25 |
| 3-Methylphenol + 4-Methylphenol | <5 | 4-Nitroaniline | <25 |
| Nitrobenzene | <0.25 | 4,6-Dinitro-2-methylphenol | <7.5 |
| Isophorone | <0.25 | 4-Bromophenyl phenyl ether | <0.25 |
| 2-Nitrophenol | <2.5 | Hexachlorobenzene | <0.25 |
| 2,4-Dimethylphenol | <2.5 | Pentachlorophenol | <1.2 |
| Benzoic acid | <12 | Phenanthrene | <0.05 |
| Bis(2-chloroethoxy)methane | <0.25 | Anthracene | <0.05 |
| 2,4-Dichlorophenol | <2.5 | Carbazole | <0.25 |
| 1,2,4-Trichlorobenzene | <0.25 | Di-n-butyl phthalate | <2.5 |
| Naphthalene | <0.05 | Fluoranthene | <0.05 |
| Hexachlorobutadiene | <0.25 | Pyrene | <0.05 |
| 4-Chloroaniline | <25 | Benzyl butyl phthalate | <2.5 |
| 4-Chloro-3-methylphenol | <2.5 | Benz(a)anthracene | <0.05 |
| 2-Methylnaphthalene | <0.05 | Chrysene | <0.05 |
| 1-Methylnaphthalene | <0.05 | Bis(2-ethylhexyl) phthalate | <4 |
| Hexachlorocyclopentadiene | <0.75 | Di-n-octyl phthalate | <2.5 |
| 2,4,6-Trichlorophenol | <2.5 | Benzo(a)pyrene | <0.05 |
| 2,4,5-Trichlorophenol | <2.5 | Benzo(b)fluoranthene | <0.05 |
| 2-Chloronaphthalene | <0.25 | Benzo(k)fluoranthene | <0.05 |
| 2-Nitroaniline | <1.2 | Indeno(1,2,3-cd)pyrene | <0.05 |
| Dimethyl phthalate | <2.5 | Dibenz(a,h)anthracene | <0.05 |
| Acenaphthylene | <0.05 | Benzo(g,h,i)perylene | <0.05 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-5 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-02 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071208.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 64 | 39 | 103 |
| Phenol-d6 | 71 | 48 | 109 |
| Nitrobenzene-d5 | 78 | 23 | 138 |
| 2-Fluorobiphenyl | 88 | 50 | 150 |
| 2,4,6-Tribromophenol | 101 | 40 | 127 |
| Terphenyl-d14 | 98 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-6 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-03 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071209.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 70 | 39 | 103 |
| Phenol-d6 | 78 | 48 | 109 |
| Nitrobenzene-d5 | 88 | 23 | 138 |
| 2-Fluorobiphenyl | 94 | 50 | 150 |
| 2,4,6-Tribromophenol | 104 | 40 | 127 |
| Terphenyl-d14 | 101 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-7 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-04 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071210.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 63 | 39 | 103 |
| Phenol-d6 | 71 | 48 | 109 |
| Nitrobenzene-d5 | 77 | 23 | 138 |
| 2-Fluorobiphenyl | 87 | 50 | 150 |
| 2,4,6-Tribromophenol | 99 | 40 | 127 |
| Terphenyl-d14 | 95 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-8 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-05 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071211.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 59 | 39 | 103 |
| Phenol-d6 | 71 | 48 | 109 |
| Nitrobenzene-d5 | 77 | 23 | 138 |
| 2-Fluorobiphenyl | 84 | 50 | 150 |
| 2,4,6-Tribromophenol | 100 | 40 | 127 |
| Terphenyl-d14 | 94 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-9 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-06 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071212.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 71 | 39 | 103 |
| Phenol-d6 | 79 | 48 | 109 |
| Nitrobenzene-d5 | 82 | 23 | 138 |
| 2-Fluorobiphenyl | 90 | 50 | 150 |
| 2,4,6-Tribromophenol | 104 | 40 | 127 |
| Terphenyl-d14 | 96 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | 0.012 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-10 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-07 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071213.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 61 | 39 | 103 |
| Phenol-d6 | 72 | 48 | 109 |
| Nitrobenzene-d5 | 79 | 23 | 138 |
| 2-Fluorobiphenyl | 89 | 50 | 150 |
| 2,4,6-Tribromophenol | 100 | 40 | 127 |
| Terphenyl-d14 | 96 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Comp-11 | Client: | Vertex |
| Date Received: | 07/07/22 | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 207101-08 1/5 |
| Date Analyzed: | 07/12/22 | Data File: | 071214.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 66 | 39 | 103 |
| Phenol-d6 | 75 | 48 | 109 |
| Nitrobenzene-d5 | 79 | 23 | 138 |
| 2-Fluorobiphenyl | 87 | 50 | 150 |
| 2,4,6-Tribromophenol | 99 | 40 | 127 |
| Terphenyl-d14 | 97 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | 0.040 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | 0.064 |
| Hexachlorobutadiene | <0.05 | Pyrene | 0.057 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | 0.024 |
| 2-Methylnaphthalene | <0.01 | Chrysene | 0.026 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | 0.032 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | 0.047 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | 0.016 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | 0.013 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | 0.010 |

## Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Vertex |
| Date Received: | Not Applicable | Project: | Fredrickson 71555, F&BI 207101 |
| Date Extracted: | 07/08/22 | Lab ID: | 02-1601 mb2 1/5 |
| Date Analyzed: | 07/11/22 | Data File: | 071111.D |
| Matrix: | Soil | Instrument: | GCMS12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| 2-Fluorophenol | 88 | 39 | 103 |
| Phenol-d6 | 97 | 48 | 109 |
| Nitrobenzene-d5 | 98 | 23 | 138 |
| 2-Fluorobiphenyl | 105 | 50 | 150 |
| 2,4,6-Tribromophenol | 109 | 40 | 127 |
| Terphenyl-d14 | 109 | 50 | 150 |

| Compounds: | Concentration mg/kg (ppm) | Compounds: | Concentration mg/kg (ppm) |
|---|---|---|---|
| Phenol | <0.5 | 2,6-Dinitrotoluene | <0.25 |
| Bis(2-chloroethyl) ether | <0.05 | 3-Nitroaniline | <5 |
| 2-Chlorophenol | <0.5 | Acenaphthene | <0.01 |
| 1,3-Dichlorobenzene | <0.05 | 2,4-Dinitrophenol | <1.5 |
| 1,4-Dichlorobenzene | <0.05 | Dibenzofuran | <0.05 |
| 1,2-Dichlorobenzene | <0.05 jl | 2,4-Dinitrotoluene | <0.25 |
| Benzyl alcohol | <0.5 | 4-Nitrophenol | <1.5 |
| 2,2'-Oxybis(1-chloropropane) | <0.05 | Diethyl phthalate | <0.5 |
| 2-Methylphenol | <0.5 jl | Fluorene | <0.01 |
| Hexachloroethane | <0.05 jl | 4-Chlorophenyl phenyl ether | <0.05 |
| N-Nitroso-di-n-propylamine | <0.05 | N-Nitrosodiphenylamine | <0.05 |
| 3-Methylphenol + 4-Methylphenol | <1 | 4-Nitroaniline | <5 |
| Nitrobenzene | <0.05 | 4,6-Dinitro-2-methylphenol | <1.5 |
| Isophorone | <0.05 | 4-Bromophenyl phenyl ether | <0.05 |
| 2-Nitrophenol | <0.5 | Hexachlorobenzene | <0.05 |
| 2,4-Dimethylphenol | <0.5 | Pentachlorophenol | <0.25 |
| Benzoic acid | <2.5 | Phenanthrene | <0.01 |
| Bis(2-chloroethoxy)methane | <0.05 | Anthracene | <0.01 |
| 2,4-Dichlorophenol | <0.5 | Carbazole | <0.05 |
| 1,2,4-Trichlorobenzene | <0.05 | Di-n-butyl phthalate | <0.5 |
| Naphthalene | <0.01 | Fluoranthene | <0.01 |
| Hexachlorobutadiene | <0.05 | Pyrene | <0.01 |
| 4-Chloroaniline | <5 | Benzyl butyl phthalate | <0.5 |
| 4-Chloro-3-methylphenol | <0.5 | Benz(a)anthracene | <0.01 |
| 2-Methylnaphthalene | <0.01 | Chrysene | <0.01 |
| 1-Methylnaphthalene | <0.01 | Bis(2-ethylhexyl) phthalate | <0.8 |
| Hexachlorocyclopentadiene | <0.15 | Di-n-octyl phthalate | <0.5 |
| 2,4,6-Trichlorophenol | <0.5 | Benzo(a)pyrene | <0.01 |
| 2,4,5-Trichlorophenol | <0.5 | Benzo(b)fluoranthene | <0.01 |
| 2-Chloronaphthalene | <0.05 | Benzo(k)fluoranthene | <0.01 |
| 2-Nitroaniline | <0.25 | Indeno(1,2,3-cd)pyrene | <0.01 |
| Dimethyl phthalate | <0.5 | Dibenz(a,h)anthracene | <0.01 |
| Acenaphthylene | <0.01 | Benzo(g,h,i)perylene | <0.01 |

Date of Report: 07/19/22
Date Received: 07/07/22
Project: Fredrickson 71555, F&BI 207101

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

Laboratory Code: 207142-01 (Duplicate)

| Analyte | Reporting Units | Sample Result (Wet Wt) | Duplicate Result (Wet Wt) | RPD (Limit 20) |
|---|---|---|---|---|
| Gasoline | mg/kg (ppm) | 22 | 21 | 5 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Gasoline | mg/kg (ppm) | 20 | 100 | 71-131 |

Date of Report: 07/19/22
Date Received: 07/07/22
Project: Fredrickson 71555, F&BI 207101

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

Laboratory Code: 207045-02 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet Wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | <50 | 94 | 100 | 73-135 | 6 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Diesel Extended | mg/kg (ppm) | 5,000 | 96 | 74-139 |

Date of Report: 07/19/22
Date Received: 07/07/22
Project: Fredrickson 71555, F&BI 207101

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

Laboratory Code: 207101-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 3.04 | 90 | 95 | 75-125 | 5 |
| Barium | mg/kg (ppm) | 50 | 42.9 | 106 | 115 | 75-125 | 8 |
| Cadmium | mg/kg (ppm) | 10 | <1 | 95 | 93 | 75-125 | 2 |
| Chromium | mg/kg (ppm) | 50 | 8.39 | 84 | 82 | 75-125 | 2 |
| Lead | mg/kg (ppm) | 50 | 5.27 | 95 | 92 | 75-125 | 3 |
| Mercury | mg/kg (ppm | 5 | <1 | 96 | 90 | 75-125 | 6 |
| Selenium | mg/kg (ppm) | 5 | <1 | 94 | 95 | 75-125 | 1 |
| Silver | mg/kg (ppm) | 10 | <1 | 96 | 94 | 75-125 | 2 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 93 | 80-120 |
| Barium | mg/kg (ppm) | 50 | 93 | 80-120 |
| Cadmium | mg/kg (ppm) | 10 | 97 | 80-120 |
| Chromium | mg/kg (ppm) | 50 | 92 | 80-120 |
| Lead | mg/kg (ppm) | 50 | 102 | 80-120 |
| Mercury | mg/kg (ppm) | 5 | 103 | 80-120 |
| Selenium | mg/kg (ppm) | 5 | 97 | 80-120 |
| Silver | mg/kg (ppm) | 10 | 98 | 80-120 |

Date of Report: 07/19/22
Date Received: 07/07/22
Project: Fredrickson 71555, F&BI 207101

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

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | mg/kg (ppm) | 1 | 122 | 115 | 10-146 | 6 |
| Chloromethane | mg/kg (ppm) | 1 | 97 | 99 | 27-133 | 2 |
| Vinyl chloride | mg/kg (ppm) | 1 | 107 | 112 | 22-139 | 5 |
| Bromomethane | mg/kg (ppm) | 1 | 132 vo | 131 vo | 38-114 | 1 |
| Chloroethane | mg/kg (ppm) | 1 | 104 | 105 | 9-163 | 1 |
| Trichlorofluoromethane | mg/kg (ppm) | 1 | 108 | 110 | 10-196 | 2 |
| Acetone | mg/kg (ppm) | 5 | 92 | 87 | 52-141 | 6 |
| 1,1-Dichloroethene | mg/kg (ppm) | 1 | 93 | 91 | 47-128 | 2 |
| Hexane | mg/kg (ppm) | 1 | 125 | 122 | 43-142 | 2 |
| Methylene chloride | mg/kg (ppm) | 1 | 100 | 95 | 10-184 | 5 |
| Methyl t-butyl ether (MTBE) | mg/kg (ppm) | 1 | 87 | 86 | 60-123 | 1 |
| trans-1,2-Dichloroethene | mg/kg (ppm) | 1 | 93 | 92 | 67-129 | 1 |
| 1,1-Dichloroethane | mg/kg (ppm) | 1 | 88 | 84 | 68-115 | 5 |
| 2,2-Dichloropropane | mg/kg (ppm) | 1 | 119 | 116 | 52-170 | 3 |
| cis-1,2-Dichloroethene | mg/kg (ppm) | 1 | 93 | 92 | 72-127 | 1 |
| Chloroform | mg/kg (ppm) | 1 | 74 | 74 | 66-120 | 0 |
| 2-Butanone (MEK) | mg/kg (ppm) | 5 | 90 | 89 | 30-197 | 1 |
| 1,2-Dichloroethane (EDC) | mg/kg (ppm) | 1 | 88 | 87 | 56-135 | 1 |
| 1,1,1-Trichloroethane | mg/kg (ppm) | 1 | 94 | 93 | 62-131 | 1 |
| 1,1-Dichloropropene | mg/kg (ppm) | 1 | 89 | 89 | 69-128 | 0 |
| Carbon tetrachloride | mg/kg (ppm) | 1 | 94 | 92 | 60-139 | 2 |
| Benzene | mg/kg (ppm) | 1 | 93 | 92 | 71-118 | 1 |
| Trichloroethene | mg/kg (ppm) | 1 | 83 | 81 | 63-121 | 2 |
| 1,2-Dichloropropane | mg/kg (ppm) | 1 | 91 | 92 | 72-127 | 1 |
| Bromodichloromethane | mg/kg (ppm) | 1 | 88 | 88 | 57-126 | 0 |
| Dibromomethane | mg/kg (ppm) | 1 | 97 | 95 | 62-123 | 2 |
| 4-Methyl-2-pentanone | mg/kg (ppm) | 5 | 99 | 94 | 45-145 | 5 |
| cis-1,3-Dichloropropene | mg/kg (ppm) | 1 | 95 | 92 | 67-122 | 3 |
| Toluene | mg/kg (ppm) | 1 | 97 | 96 | 66-126 | 1 |
| trans-1,3-Dichloropropene | mg/kg (ppm) | 1 | 93 | 92 | 72-132 | 1 |
| 1,1,2-Trichloroethane | mg/kg (ppm) | 1 | 98 | 97 | 64-115 | 1 |
| 2-Hexanone | mg/kg (ppm) | 5 | 99 | 98 | 33-152 | 1 |
| 1,3-Dichloropropane | mg/kg (ppm) | 1 | 94 | 92 | 72-130 | 2 |
| Tetrachloroethene | mg/kg (ppm) | 1 | 98 | 96 | 72-114 | 2 |
| Dibromochloromethane | mg/kg (ppm) | 1 | 102 | 100 | 55-121 | 2 |
| 1,2-Dibromoethane (EDB) | mg/kg (ppm) | 1 | 99 | 96 | 74-132 | 3 |
| Chlorobenzene | mg/kg (ppm) | 1 | 100 | 98 | 76-111 | 2 |
| Ethylbenzene | mg/kg (ppm) | 1 | 95 | 94 | 64-123 | 1 |
| 1,1,1,2-Tetrachloroethane | mg/kg (ppm) | 1 | 94 | 94 | 64-121 | 0 |
| m,p-Xylene | mg/kg (ppm) | 2 | 97 | 95 | 78-122 | 2 |
| o-Xylene | mg/kg (ppm) | 1 | 91 | 91 | 77-124 | 0 |
| Styrene | mg/kg (ppm) | 1 | 97 | 96 | 74-126 | 1 |
| Isopropylbenzene | mg/kg (ppm) | 1 | 95 | 93 | 76-127 | 2 |
| Bromoform | mg/kg (ppm) | 1 | 107 | 108 | 56-132 | 1 |
| n-Propylbenzene | mg/kg (ppm) | 1 | 101 | 100 | 74-124 | 1 |
| Bromobenzene | mg/kg (ppm) | 1 | 100 | 103 | 72-122 | 3 |
| 1,3,5-Trimethylbenzene | mg/kg (ppm) | 1 | 95 | 94 | 76-126 | 1 |
| 1,1,2,2-Tetrachloroethane | mg/kg (ppm) | 1 | 114 | 113 | 56-143 | 1 |
| 1,2,3-Trichloropropane | mg/kg (ppm) | 1 | 101 | 100 | 61-137 | 1 |
| 2-Chlorotoluene | mg/kg (ppm) | 1 | 99 | 98 | 74-121 | 1 |
| 4-Chlorotoluene | mg/kg (ppm) | 1 | 100 | 99 | 75-122 | 1 |
| tert-Butylbenzene | mg/kg (ppm) | 1 | 98 | 98 | 73-130 | 0 |
| 1,2,4-Trimethylbenzene | mg/kg (ppm) | 1 | 94 | 94 | 76-125 | 0 |
| sec-Butylbenzene | mg/kg (ppm) | 1 | 97 | 97 | 71-130 | 0 |
| p-Isopropyltoluene | mg/kg (ppm) | 1 | 98 | 99 | 70-132 | 1 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 1 | 99 | 98 | 75-121 | 1 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 1 | 99 | 101 | 74-117 | 2 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 1 | 98 | 98 | 76-121 | 0 |
| 1,2-Dibromo-3-chloropropane | mg/kg (ppm) | 1 | 88 | 86 | 58-138 | 2 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 1 | 93 | 96 | 64-135 | 3 |
| Hexachlorobutadiene | mg/kg (ppm) | 1 | 103 | 101 | 50-153 | 2 |
| Naphthalene | mg/kg (ppm) | 1 | 89 | 90 | 63-140 | 1 |
| 1,2,3-Trichlorobenzene | mg/kg (ppm) | 1 | 95 | 95 | 63-138 | 0 |

Date of Report: 07/19/22
Date Received: 07/07/22
Project: Fredrickson 71555, F&BI 207101

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

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Phenol | mg/kg (ppm) | 0.83 | 62 | 62 | 47-128 | 0 |
| Bis(2-chloroethyl) ether | mg/kg (ppm) | 0.83 | 54 | 56 | 35-131 | 4 |
| 2-Chlorophenol | mg/kg (ppm) | 0.83 | 65 | 62 | 58-111 | 5 |
| 1,3-Dichlorobenzene | mg/kg (ppm) | 0.83 | 59 | 54 | 52-105 | 9 |
| 1,4-Dichlorobenzene | mg/kg (ppm) | 0.83 | 58 | 56 | 53-106 | 4 |
| 1,2-Dichlorobenzene | mg/kg (ppm) | 0.83 | 56 | 53 vo | 54-105 | 6 |
| Benzyl alcohol | mg/kg (ppm) | 4.2 | 68 | 68 | 36-147 | 0 |
| 2,2'-Oxybis(1-chloropropane) | mg/kg (ppm) | 0.83 | 58 | 58 | 58-97 | 0 |
| 2-Methylphenol | mg/kg (ppm) | 0.83 | 62 vo | 65 | 65-107 | 5 |
| Hexachloroethane | mg/kg (ppm) | 0.83 | 60 | 54 vo | 58-107 | 11 |
| N-Nitroso-di-n-propylamine | mg/kg (ppm) | 0.83 | 80 | 77 | 70-130 | 4 |
| 3-Methylphenol + 4-Methylphenol | mg/kg (ppm) | 0.83 | 70 | 69 | 67-109 | 1 |
| Nitrobenzene | mg/kg (ppm) | 0.83 | 69 | 67 | 63-112 | 3 |
| Isophorone | mg/kg (ppm) | 0.83 | 80 | 82 | 52-128 | 2 |
| 2-Nitrophenol | mg/kg (ppm) | 0.83 | 85 | 89 | 62-119 | 5 |
| 2,4-Dimethylphenol | mg/kg (ppm) | 0.83 | 72 | 68 | 53-119 | 6 |
| Benzoic acid | mg/kg (ppm) | 2.5 | 83 | 81 | 13-223 | 2 |
| Bis(2-chloroethoxy)methane | mg/kg (ppm) | 0.83 | 76 | 75 | 65-108 | 1 |
| 2,4-Dichlorophenol | mg/kg (ppm) | 0.83 | 70 | 74 | 67-109 | 6 |
| 1,2,4-Trichlorobenzene | mg/kg (ppm) | 0.83 | 59 | 61 | 58-109 | 3 |
| Naphthalene | mg/kg (ppm) | 0.83 | 62 | 61 | 58-108 | 2 |
| Hexachlorobutadiene | mg/kg (ppm) | 0.83 | 65 | 62 | 55-108 | 5 |
| 4-Chloroaniline | mg/kg (ppm) | 4.2 | 30 | 41 | 10-136 | 31 vo |
| 4-Chloro-3-methylphenol | mg/kg (ppm) | 0.83 | 85 | 83 | 70-130 | 2 |
| 2-Methylnaphthalene | mg/kg (ppm) | 0.83 | 69 | 68 | 67-108 | 1 |
| 1-Methylnaphthalene | mg/kg (ppm) | 0.83 | 70 | 69 | 66-107 | 1 |
| Hexachlorocyclopentadiene | mg/kg (ppm) | 0.83 | 74 | 71 | 46-127 | 4 |
| 2,4,6-Trichlorophenol | mg/kg (ppm) | 0.83 | 84 | 83 | 65-116 | 1 |
| 2,4,5-Trichlorophenol | mg/kg (ppm) | 0.83 | 86 | 85 | 67-117 | 1 |
| 2-Chloronaphthalene | mg/kg (ppm) | 0.83 | 74 | 73 | 67-109 | 1 |
| 2-Nitroaniline | mg/kg (ppm) | 4.2 | 97 | 97 | 46-148 | 0 |
| Dimethyl phthalate | mg/kg (ppm) | 0.83 | 88 | 92 | 70-130 | 4 |
| Acenaphthylene | mg/kg (ppm) | 0.83 | 83 | 82 | 70-130 | 1 |
| 2,6-Dinitrotoluene | mg/kg (ppm) | 0.83 | 86 | 91 | 70-130 | 6 |
| Acenaphthene | mg/kg (ppm) | 0.83 | 80 | 80 | 66-112 | 0 |
| 2,4-Dinitrophenol | mg/kg (ppm) | 1.7 | 101 | 106 | 10-233 | 5 |
| Dibenzofuran | mg/kg (ppm) | 0.83 | 75 | 74 | 63-117 | 1 |
| 2,4-Dinitrotoluene | mg/kg (ppm) | 0.83 | 100 | 101 | 63-137 | 1 |
| 4-Nitrophenol | mg/kg (ppm) | 1.7 | 101 | 103 | 16-187 | 2 |
| Diethyl phthalate | mg/kg (ppm) | 0.83 | 89 | 92 | 64-120 | 3 |
| Fluorene | mg/kg (ppm) | 0.83 | 84 | 85 | 67-117 | 1 |
| 4-Chlorophenyl phenyl ether | mg/kg (ppm) | 0.83 | 84 | 85 | 70-130 | 1 |
| N-Nitrosodiphenylamine | mg/kg (ppm) | 0.83 | 84 | 90 | 70-130 | 7 |
| 4-Nitroaniline | mg/kg (ppm) | 4.2 | 88 | 96 | 45-150 | 9 |
| 4,6-Dinitro-2-methylphenol | mg/kg (ppm) | 0.83 | 110 | 122 | 51-152 | 10 |
| 4-Bromophenyl phenyl ether | mg/kg (ppm) | 0.83 | 95 | 93 | 70-130 | 2 |
| Hexachlorobenzene | mg/kg (ppm) | 0.83 | 86 | 89 | 70-130 | 3 |
| Pentachlorophenol | mg/kg (ppm) | 0.83 | 103 | 113 | 60-133 | 9 |
| Phenanthrene | mg/kg (ppm) | 0.83 | 86 | 93 | 70-130 | 8 |
| Anthracene | mg/kg (ppm) | 0.83 | 85 | 92 | 70-130 | 8 |
| Carbazole | mg/kg (ppm) | 0.83 | 89 | 100 | 70-130 | 12 |
| Di-n-butyl phthalate | mg/kg (ppm) | 0.83 | 77 | 87 | 55-123 | 12 |
| Fluoranthene | mg/kg (ppm) | 0.83 | 92 | 101 | 70-130 | 9 |
| Pyrene | mg/kg (ppm) | 0.83 | 92 | 93 | 70-130 | 1 |
| Benzyl butyl phthalate | mg/kg (ppm) | 0.83 | 112 | 115 | 67-119 | 3 |
| Benz(a)anthracene | mg/kg (ppm) | 0.83 | 95 | 99 | 70-130 | 4 |
| Chrysene | mg/kg (ppm) | 0.83 | 91 | 95 | 70-130 | 4 |
| Bis(2-ethylhexyl) phthalate | mg/kg (ppm) | 0.83 | 100 | 106 | 59-116 | 6 |
| Di-n-octyl phthalate | mg/kg (ppm) | 0.83 | 108 | 117 | 46-129 | 8 |
| Benzo(a)pyrene | mg/kg (ppm) | 0.83 | 89 | 96 | 68-120 | 8 |
| Benzo(b)fluoranthene | mg/kg (ppm) | 0.83 | 90 | 97 | 69-125 | 7 |
| Benzo(k)fluoranthene | mg/kg (ppm) | 0.83 | 93 | 99 | 70-130 | 6 |
| Indeno(1,2,3-cd)pyrene | mg/kg (ppm) | 0.83 | 97 | 107 | 67-129 | 10 |
| Dibenz(a,h)anthracene | mg/kg (ppm) | 0.83 | 98 | 106 | 67-128 | 8 |
| Benzo(g,h,i)perylene | mg/kg (ppm) | 0.83 | 95 | 103 | 64-127 | 8 |

# Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

207101

# SAMPLE CHAIN OF CUSTODY

07/07/22

003/VSA4

Page # 1 of 1

Report To Jason Cass

Company Vertex

Address 810 3rd Ave, Suite 307

City, State, ZIP Seattle, WA 98104

Phone 206-429-6200 Email jcass@vertexeng.com

SAMPLERS (*signature*) Allyson Eng

PROJECT NAME Fredrickson

PO # 71555

REMARKS Project specific RLs? - Yes / No

INVOICE TO

TURNAROUND TIME
- ☑ Standard turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | RCRA Metals | SVOCs | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 01A-E | | | | | ANALYSES REQUESTED | | | | | | | | | | | |
| Comp-4 | ~~7/6/22~~ AE | 7/6/22 | 1305 | soil | 5 | X | X | | | X | | X | X | X | | | Hold BAE PCB |
| Comp-5 | 02 | | 1240 | | | | | | | | | | | | | | Hold PCBs |
| Comp-6 | 03 | | 1445 | | | | | | | | | | | | | | Hold PCBs |
| Comp-7 | 04 | | 1445 | | | | | | | | | | | | | | Hold PCBs |
| Comp-8 | 05 | | 1640 | | | | | | | | | | | | | | Hold PCBs |
| Comp-9 | 06 | 7/7/22 | 1150 | | | | | | | | | | | | | | Hold PCBs |
| Comp-10 | 07 | | 1155 | | | | | | | | | | | | | | Hold PCBs |
| Comp-11 | 08 | | 1345 | | | | | | | | | | | | | | Hold PCBs |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | K. Norsworthy | VERTEX | 7-7-22 | 18:05 |
| Received by: | BISRAT TARESE | FSI | 7/7/22 | 18:05 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 5 °C | | |

*Friedman & Bruya, Inc.*
*Ph. (206) 285-8282*