

## **Soil and Groundwater Assessment**

Cle Elum City  
Site Assessment  
Cle Elum, Washington

*for*  
**Washington State Department of Ecology**

July 26, 2021



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## Cle Elum City Site Assessment Cle Elum, Washington

File No. 0504-177-00

July 26, 2021

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## ACRONYMS AND ABBREVIATIONS

bgs – below ground surface

BTEX – benzene, toluene, ethylbenzene and xylenes

COC – contaminants of concern

DO – dissolved oxygen

DRPH – diesel-range petroleum hydrocarbons

DTW – Depth to water

Ecology – Washington State Department of Ecology

EPA – United States Environmental Protection Agency

ESA – Environmental Site Assessment

GeoEngineers – GeoEngineers, Inc.

GRPH – gasoline-range petroleum hydrocarbons

µS/M – microseimens per meter

mg/L – milligrams per liter

MTCA – Model Toxics Control Act

mV – millivolts

NTU – nephelometric turbidity unit

ORP – oxidation/reduction potential

ORPH – oil-range petroleum hydrocarbons

PID – photoionization detector

ppm – parts per million

SV – soil vapor

TOC – top of casing

UST – underground storage tank

VOC – volatile organic compounds

## 1.0 INTRODUCTION

This report describes soil and groundwater assessment activities and results conducted at the Cle Elum City site located at the southwest corner of 1<sup>st</sup> Street and Billings Avenue in Cle Elum, Washington (herein referred to as “site”). The approximate site location is shown in the attached Vicinity Map, Figure 1. Washington State Department of Ecology (Ecology) reference numbers for the site include Facility Site ID 390 and Cleanup Site ID 4762.

This assessment report has been prepared by GeoEngineers, Inc. (GeoEngineers) for Ecology under Contract Number C1900044 and Work Assignment No. GEI037. This report describes the site history, field activities, observations and chemical analytical results associated with soil and groundwater samples collected at the site. The purpose of the assessment activities was to investigate if contamination greater than the Model Toxics Control Act (MTCA) cleanup levels is present at the site related to a historic fuel release.

## 2.0 SITE DESCRIPTION AND BACKGROUND

The site is currently occupied by the Timber Lodge Inn and is bound by 1<sup>st</sup> Street to the north, Billings Avenue the east, West Railroad Avenue to the south and a vacant lot to the west. The property is dominated by asphalt concrete pavement surfacing that surrounds the current Timber Lodge Inn structure. Concrete pavement curb, sidewalk, and gutter buffer the perimeter of the property to the northeast and south.

Before the Timber Lodge Inn was constructed, the site was occupied by the Preston Phillips 66 service station. In 1977, the Preston Phillips 66 service station was closed. According to the Timber Lodge Inn owners, two 1,000-gallon underground storage tanks (USTs), one 500-gallon UST and fuel dispensing pumps and piping associated with the Preston Phillips 66 service station were removed when the property changed ownership (Ecology 1996).

Subsurface petroleum contamination was encountered at the site by a US West crew during an underground utility installation project on November 19, 1991 (Ecology 1996). The reported petroleum contaminated soil was observed at approximately 10 feet below ground surface (bgs) in a utility manhole excavation located near the southwest corner of 1<sup>st</sup> Street and Billings Avenue. The fuel dispensing pumps reportedly were located approximately 10 feet from the 1991 manhole excavation.

In 1996, an environmental site assessment (ESA) was conducted to evaluate the presence of petroleum-related contamination at the site along with multiple other sites in Cle Elum primarily along 1<sup>st</sup> Avenue (Ecology 1996). During the 1996 ESA, multiple soil borings and monitoring wells were advanced and installed to evaluate subsurface soil and groundwater contamination.

Approximately 20 soil vapor (SV) borings and 25 soil borings were advanced as part of the 1996 ESA. Four borings were located near the site (SV-3 and SB-4 through SB-6). Boring SV-3 was advanced to 5 feet bgs along the west side of Billings Avenue to evaluate subsurface soil vapor concentrations. Soil vapor concentrations ranged from 16 to 24 parts per million (ppm) as methane in vapor samples from SV-3. Borings SB-4 through SB-6 were advanced to depths between 12½ to 15 feet bgs north of the site and were finished as groundwater monitoring wells (MW-4 through MW-6) to evaluate subsurface soil and groundwater conditions (Ecology 1996). Locations of the 1996 soil vapor and monitoring wells near the

site are shown on the Site Plan, Figure 2. Soil and groundwater analytical results are provided on Tables 1 and 2, respectively.

Analysis of soil samples from the three monitoring well installations indicated gasoline detected at concentrations greater than the 1996 MTCA Method A cleanup levels in SB-5/MW-5 at a depth of 5 to 6 feet bgs. Contaminants of concern (COCs) were less than the MTCA cleanup levels in SB-4/MW-4 and S-6/MW-6. A second sample collected from SB-5/MW-5 at a depth of 14.5 to 15 feet bgs did not indicate the presence of petroleum contamination greater than the MTCA Method A cleanup level. Groundwater samples collected from MW-5 in June and September 1996 and from MW-4 and MW-6 in June 1996 did not contain COCs greater than the applicable MTCA Method A cleanup levels in 1996.

### **3.0 FIELD ACTIVITIES**

The following sections describe field activities including: developing and sampling the existing groundwater well, advancing direct-push borings and a discussion on observed subsurface conditions. Field activities were conducted in general accordance with the site work plan (GeoEngineers 2021).

#### **3.1. Groundwater Well Development and Sampling**

On April 29, 2021, GeoEngineers mobilized to the site to evaluate and redevelop the existing groundwater well at the site (MW-5). Inspection of the well and monument indicated that the monitoring well appeared to have been altered during the recent concrete work around the well monument. The monument lid was damaged, multiple tabs for the monument lid were missing, and what appeared to be a spliced in section of PVC riser pipe was observed. Due to potential monitoring well alterations to the original monitoring well construction, groundwater elevations for MW-5 were not estimated as part of this assessment.

Using an electronic interface probe, the groundwater surface was measured 7.26 feet below the top of casing (TOC) and the total well depth was measured 13.68 feet below the TOC. Using a decontaminated stainless-steel bailer, approximately 12 gallons of water were removed from the well. A decontaminated stainless-steel hurricane pump was then used to surge the well and an additional 18 gallons of water were removed. Extracted groundwater initially was opaque reddish-brown, but after redevelopment, the water was clear and colorless. Development water was placed into a steel 55-gallon drum and brought to the GeoEngineers Spokane Office.

On May 3, 2021, GeoEngineers returned to the site to sample MW-5. Before sampling, a volatile organic compound (VOC) headspace measurement of 0.5 parts per million was recorded using a photoionization detector (PID). The depth to groundwater was measured at 7.37 feet below the TOC. Using a peristaltic pump, the well was purged at about 200 milliliters per minute for approximately 15 minutes before a groundwater sample was collected. During well purging, field water quality parameters were measured using a YSI multi-parameter water quality meter. A water sample and duplicate sample were collected after water quality parameters stabilized. Water samples were submitted to Eurofins TestAmerica under standard chain-of-custody protocol. Analytical results are discussed in Section 4.0.

#### **3.2. Direct-Push Soil Assessment**

On May 17, 2021, the proposed locations of the soil borings identified in the work plan were marked using white spray paint. Site utilities located near the boring locations were identified and marked by Utilities Plus

during the initial site visit. Multiple underground utilities were noted along the southern shoulder of 1<sup>st</sup> Street near the monitoring well. Additionally, high pressure gas lines and other utilities were observed on the west shoulder of Billings Avenue, running parallel. As a result of the subsurface utilities, the boring locations were moved to the northbound lane of Billings Avenue. Boring locations are shown on Figure 2.

Cascade Drilling (Cascade) advanced three borings (GEI037-B1 through GEI037-B3) in the northbound lane of Billings Avenue on May 25, 2021. The borings were advanced to approximately 10 feet bgs. Drilling for each boring was terminated after the second drill rod run when groundwater was encountered. Soil samples recovered from the direct-push borings were field screened in accordance with the work plan (GeoEngineers 2021). The following summarizes the results of field screening and selection of soil samples for laboratory chemical analysis.

- Field screening did not indicate the presence of petroleum contamination in GEI037-B1 and therefore the soil sample collected for laboratory analysis was obtained just above the groundwater interface at 8 to 8½ feet bgs. A PID reading of 2.4 ppm was measured about 1 foot bgs, but it is unlikely this detection was related to a release from the former gas station at this depth, and the PID reading could have been influenced from the asphalt.
- Field screening indicated the greatest presence of petroleum contamination in GEI037-B2 at about 5½ to 6 feet bgs. This was indicated by a PID reading of 7.2 ppm and, therefore, soil from this interval was selected for laboratory analysis. The depth interval selected for laboratory chemical analysis was the only soil that had a PID reading greater than 1 ppm.
- Field screening indicated the greatest presence of petroleum contamination in GEI037-B3 at about 5 to 5½ feet bgs. This was indicated by a PID reading of 94.7 ppm and, therefore, soil from this interval was selected for laboratory analysis.

After selecting a soil sample for chemical analysis from each boring, grab groundwater samples were then collected by installing a new 5-foot section of 1-inch-diameter well screen into the boring. Groundwater was then purged using a peristaltic pump using low-flow sampling techniques for approximately 15 minutes. At the completion of the 15-minute purge interval, a grab groundwater sample was collected.

Cascade backfilled each boring with bentonite chips, hydrated the chips and finished the backfill with asphalt cold patch. Excess soil cuttings were placed in a 55-gallon drum, labeled and stored on site pending analysis and disposal. Boring logs associated with the borings are included in Appendix A. The work plan developed to guide field activities is included as Appendix B.

### 3.3. Subsurface Conditions

Subsurface conditions as indicated by soil recovered from GEI037-B1 through GEI037-B3 indicated the following soil profile from the surface:

- 3 inches of asphalt concrete pavement;
- 1 to 1½ feet of brown fine to coarse sand with trace silt;
- 1 to 1½ feet of brown silty fine sand with occasional gravel; and
- Brown fine to coarse gravel with silt and sand to the depths explored.



Groundwater was encountered at about 8 feet bgs. Based on historical groundwater data provided in the 1996 ESA, the estimated groundwater at the site is generally to the south and southeast (Ecology 1996).

## **4.0 CHEMICAL ANALYTICAL RESULTS**

The following sections describe soil and groundwater chemical results. Laboratory reports and a data validation report are included in Appendix B. Soil and groundwater analytical results are summarized in Tables 3 and 4 respectively.

### **4.1. Soil Chemical Analytical Results**

Three soil samples were submitted to Eurofins TestAmerica (Eurofins) for analyses of the following COCs:

- Gasoline-Range Petroleum Hydrocarbons (GRPH) using Northwest Method NWTPH-Gx;
- Diesel-Range Petroleum Hydrocarbons (DRPH) and Oil-Range Petroleum Hydrocarbons (ORPH) using Northwest Method NWTPH-Dx; and
- Benzene, toluene, ethylbenzene and xylene (BTEX) using Environmental Protection Agency (EPA) Method 8260D.

Chemical analytical results are summarized and compared to MTCA Method A cleanup levels for unrestricted land use in Summary of Chemical Analytical Results - Soil, Table 3. COCs were not detected above laboratory reporting limits in soil from GEI037-B1 and GEI037-B2. DRPH and ORPH were detected at concentrations greater than the laboratory reporting limit in GEI037-B3; however, concentrations were less than the respective MTCA Method A cleanup levels. Other COCs were less than the laboratory reporting limit in soil analyzed from GEI037-B3.

### **4.2. Groundwater Chemical Analytical Results**

Four groundwater samples were submitted to Eurofins for analyses of the following:

- GRPH using Northwest Method NWTPH-Gx;
- DRPH and ORPH using Northwest Method NWTPH-Dx; and
- BTEX using EPA Method 8260D.

Three of the groundwater samples were obtained from the direct push borings on May 25, 2021. The fourth sample was collected from MW-5 on May 3, 2021. Duplicate groundwater samples were collected on May 3 and 25, 2021.

Chemical analytical results are summarized and compared to MTCA Method A cleanup levels for unrestricted land use in Summary of Chemical Analytical Results - Groundwater, Table 4. COCs were less than the laboratory reporting limits for each of the samples analyzed.

### **4.3. Groundwater Quality Parameters**

During groundwater purging, temperature, pH, specific conductivity, oxygen-reduction potential (ORP), dissolved oxygen (DO), turbidity and temperature were measured in the field using a calibrated YSI Pro DSS multi-parameter meter equipped with a flow-through cell. Reported field parameters reflect conditions at

the conclusion of purging the temporary groundwater sampling point. Field measurement results are summarized below in Table I.

**TABLE I. WATER QUALITY PARAMETERS**

Sample Identification	Date Sampled	pH	Specific Conductivity (µS/m)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Temperature (°C)
MW-5	5/3/2021	6.39	1355	79.7	1.74	8.35	11.2
GEI037-B1	5/25/2021	6.57	402.2	55.5	2.64	57.10	11.9
GEI037-B2	5/25/2021	6.54	954	-443.2	0.26	39.29	14.0
GEI037-B3	5/25/2021	6.61	850	-245.1	0.64	43.16	13.5

Notes:

µS/M = microseimens per meter; NTU = nephelometric turbidity units; mg/L = milligrams per liter; °C = degrees centigrade; mV = millivolts; DTW = Depth to water

## 5.0 SUMMARY AND CONCLUSIONS

An existing site monitoring well (MW-5) was sampled on May 5, 2021. Analytical results indicated COCs were less than the MTCA Method A cleanup levels. Therefore, follow up assessment was conducted by advancing three direct-push soil borings downgradient of the historic petroleum contamination area in Billings Avenue away from subsurface utilities.

Laboratory chemical analysis of soil and groundwater samples obtained from the three borings indicated COCs were less than the MTCA Method A cleanup levels. The results of this soil and groundwater assessment for the Cle Elum City site indicate additional remedial action for the site is not warranted. Because the lid and monument of MW-5 was found in poor condition, the well monument should be replaced or the well should be abandoned.

## 6.0 LIMITATIONS

We have prepared this report for the exclusive use of Ecology and their authorized agents.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. The conclusions and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to “Report Limitations and Guidelines for Use,” Appendix C, for additional information pertaining to use of this report.

## 7.0 REFERENCES

GeoEngineers, Inc. 2021. Work Plan, Cle Elum City, Cle Elum, Washington.” May 4, 2021. GEI File Number 0504-177-00.

State of Washington Department of Ecology (Ecology). 1996. Phase 1 and 2 Environmental Site Assessment, Former and Current Service Stations and Bulk Storage Facilities, Cle Elum, Washington. Dated December 1996.



# Table 1

## Historic Chemical Analytical Results - Soil Cle Elum Site Assessment Cle Elum, Washington

				Location ID	SB-4 <sup>1</sup>	SB-5 <sup>1</sup>	SB-5 <sup>1</sup>	SB-6 <sup>1</sup>
				Sample ID	CE04S	CE05S	CE05AS	CE06S
				Sample Date	4/21/1996	4/28/1996	4/28/1997	4/29/1996
				Sample Depth (bgs)	6.5 to 7.5	5 to 6	14.5 to 15	8.5 to 9.5
Method	Analyte	Units	MTCA Method A (1996) CULs <sup>6</sup>					
WTPH-G <sup>2</sup>	Gasoline-range hydrocarbons	mg/kg	100	12 U	<b>270</b>	26	14 U	
WTPH-D <sup>3</sup>	Diesel-range hydrocarbons	mg/kg	200	98 U	65 U	130 U	95 U	
VOCs <sup>4</sup>	Benzene	mg/kg	0.5	0.10 U	0.068 U	-	0.062 U	
	Ethylbenzene	mg/kg	20	0.10 U	<b>0.29</b>	-	0.062 U	
	Toluene	mg/kg	40	0.10 U	<b>0.16</b>	-	0.062 U	
	Total Xylenes	mg/kg	20	0.31 U	0.21 U	-	0.19 U	
Lead <sup>5</sup>	Total Lead	mg/kg	250	<b>63.0</b>	<b>14.9</b>	-	<b>17.2</b>	

### Notes

<sup>1</sup>Samples analyzed by Manchester Environmental Laboratory as part of the December 1996 Phase 1 and 2 ESA in Cle Elum, Washington

<sup>2</sup>Gasoline-range hydrocarbons analyzed using Washington State Department of Ecology Method WTPH-G.

<sup>3</sup>Diesel and Oil-range hydrocarbons analyzed using Washington State Department of Ecology Method WTPH-D.

<sup>4</sup>Volatile organic compounds analyzed using EPA SW846 Method 8020.

<sup>5</sup>Total Lead analyzed using EPA Method 239.2.

<sup>6</sup>MTCA Method A 1996 soil cleanup levels (CUL).

mg/kg = milligrams per kilogram

U = analyte was not detected above the laboratory reporting or method detection limit (RL or MDL, respectively).

- = analyte not tested.

**Bold** indicates analyte was detected.

Gray shading and **bold** indicates the analyte exceeded the then current referenced cleanup level

**Table 2**  
**Historic Chemical Analytical Results - Groundwater**  
 Cle Elum Site Assessment  
 Cle Elum, Washington

			Location ID	MW-4 <sup>1</sup>	MW-5 <sup>1</sup>	MW-5 <sup>1</sup>	MW-6 <sup>1</sup>
			Sample ID	CE04W	CE05W	CE05W	CE06W
			Sample Date	6/24/1996	6/24/1996	9/27/1996	6/24/1996
Method	Analyte	Units	MTCA Method A (1996) CULs <sup>6</sup>				
WTPH-G <sup>2</sup>	Gasoline-range hydrocarbons	µg/L	1,000	120 U	<b>240 NJ</b>	<b>100 J</b>	120 U
WTPH-D <sup>3</sup>	Diesel-range hydrocarbons	mg/L	1.0	0.27 U	-	0.15 U	0.25 U
	Lube oil-range hydrocarbons	mg/L	1.0	-	-	-	-
VOCs <sup>4</sup>	Benzene	µg/L	5	1.0 U	1.0 U	<b>0.58 J</b>	1.0 U
	Ethylbenzene	µg/L	30	1.0 UJ	1.0 UJ	<b>0.58 J</b>	1.0 UJ
	Toluene	µg/L	40	1.0 U	1.0 U	<b>0.40 J</b>	1.0 U
	Total Xylenes	µg/L	20	3.0 UJ	3.0 UJ	<b>0.24 J</b>	3.0 UJ
	Xylene, m-,p-	µg/L	NE	-	-	<b>0.12 J</b>	-
Xylene, o-	µg/L	NE	-	-	<b>0.12 J</b>	-	
Lead <sup>5</sup>	Total Lead	µg/L	5	<b>1.8</b>	<b>3.4</b>	-	<b>1.6</b>

**Notes**

<sup>1</sup>Samples analyzed by Manchester Environmental Laboratory as part of the December 1996 Phase 1 and 2 ESA in Cle Elum, Washington

<sup>2</sup>Gasoline-range hydrocarbons analyzed using Washington State Department of Ecology Method WTPH-G.

<sup>3</sup>Diesel and Oil-range hydrocarbons analyzed using Washington State Department of Ecology Method WTPH-D.

<sup>4</sup>Volatile organic compounds analyzed using EPA SW846 Method 8020.

<sup>5</sup>Total Lead analyzed using EPA Method 239.2.

<sup>6</sup>MTCA Method A 1996 groundwater cleanup levels (CUL).

mg/L = milligrams per liter; µg/L = micrograms per liter; NE = not established

U = analyte was not detected above the laboratory reporting or method detection limit (RL or MDL, respectively).

J = estimated concentration.

UJ = the analyte was not detected at or above the reported estimated result.

NJ = evidence the analyte is present, estimated concentration.

- = analyte not tested.

**Bold** indicates analyte was detected.

**Table 3**  
**Summary of Chemical Analytical Results - Soil**  
Cle Elum Site Assessment  
Cle Elum, Washington

				Location ID	GEI037-B1 <sup>1</sup>	GEI037-B2 <sup>1</sup>	GEI037-B3 <sup>1</sup>
				Sample ID	GEI037-B1 (8-8.6)	GEI037-B2 (5.5-6)	GEI037-B3 (5-5.5)
				Sample Date	5/25/2021	5/25/2021	5/25/2021
				Sample Depth (bgs)	8 to 8.5	5.5 to 6	5 to 5.5
Method	Analyte	Units	MTCA Method A Unrestricted CULs <sup>5</sup>				
NWTPH-Gx <sup>2</sup>	Gasoline-Range Hydrocarbons	mg/kg	30 / 100 <sup>6</sup>	5.7 U	5.5 U	5.6 U	
NWTPH-Dx <sup>3</sup>	Diesel-Range Hydrocarbons	mg/kg	2,000	10 U	10 U	<b>67 J</b>	
	Lube oil-range hydrocarbons	mg/kg	2,000	26 U	25 U	<b>450</b>	
VOCs <sup>4</sup>	Benzene	mg/kg	0.03	0.023 U	0.022 U	0.022 U	
	Ethylbenzene	mg/kg	6	0.11 U	0.11 U	0.11 U	
	Toluene	mg/kg	7	0.11 U	0.11 U	0.11 U	
	Total Xylenes	mg/kg	9	0.68 U	0.66 U	0.67 U	
	Xylene, m-,p-	mg/kg	NE	0.45 U	0.44 U	0.45 U	
	Xylene, o-	mg/kg	NE	0.23 U	0.22 U	0.22 U	

**Notes**

<sup>1</sup>Samples analyzed by Eurofins TestAmerica located in Spokane Valley, Washington.

<sup>2</sup>Gasoline-range hydrocarbons analyzed using Northwest Method NWTPH-Gx.

<sup>3</sup>Diesel and Oil-range hydrocarbons analyzed using Northwest Method NWTPH-Dx.

<sup>4</sup>Volatile organic compounds (VOCs) analyzed using EPA Method 8260D.

<sup>5</sup>MTCA Method A unrestricted land use cleanup levels (CUL).

<sup>6</sup>Gasoline-range hydrocarbons when benzene is present / no detectable benzene.

mg/kg = milligrams per kilogram; NE = not established

U = analyte was not detected above the laboratory reporting or method detection limit (RL or MDL, respectively).

J = estimated concentration.

- = analyte not tested.

**Bold** indicates analyte was detected.

Gray shading and **bold** indicates the analyte exceeded the current referenced cleanup level

## Table 4

### Summary of Chemical Analytical Results - Groundwater

Cle Elum Site Assessment  
Cle Elum, Washington

				Location ID	GEI037-B1 <sup>1</sup>	GEI037-B2 <sup>1</sup>	GEI037-B3 <sup>1</sup>	GEI037-B3 <sup>1</sup>	GEI037-MW-5 <sup>1</sup>	GEI037-MW-5 <sup>1</sup>
				Sample ID	GEI037-B1- 052521	GEI037-B2- 052521	GEI037-B3- 052521	GEI037-DUP- 052521	GEI037-MW-5- 050321	GEI037-DUP- 050321
				Sample Date	5/25/2021	5/25/2021	5/25/2021	5/25/2021	5/3/2021	5/3/2021
Method	Analyte	Units	MTCA Method A Unrestricted CULs <sup>5</sup>							
NWTPH-Gx <sup>2</sup>	Gasoline-Range Hydrocarbons	µg/L	800/1,000 <sup>6</sup>	150 U	150 U	150 U	150 U	150 U	150 U	150 U
NWTPH-Dx <sup>3</sup>	Diesel-Range Hydrocarbons	mg/L	0.5	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
	Lube oil-range hydrocarbons	mg/L	0.5	0.39 U	0.39 U	0.38 U	0.38 U	0.38 U	0.38 U	0.39 U
VOCs <sup>4</sup>	Benzene	µg/L	5	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
	Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	Toluene	µg/L	1,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	Total Xylenes	µg/L	1,000	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
	Xylene, m-,p-	µg/L	NE	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
	Xylene, o-	µg/L	NE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

#### Notes

<sup>1</sup>Samples analyzed by Eurofins TestAmerica located in Spokane Valley, Washington.

<sup>2</sup>Gasoline-range hydrocarbons analyzed using Northwest Method NWTPH-Gx.

<sup>3</sup>Diesel and Oil-range hydrocarbons analyzed using Northwest Method NWTPH-Dx.

<sup>4</sup>Volatile organic compounds (VOCs) analyzed using EPA Method 8260D.

<sup>5</sup>MTCA Method A unrestricted land use cleanup levels (CUL).

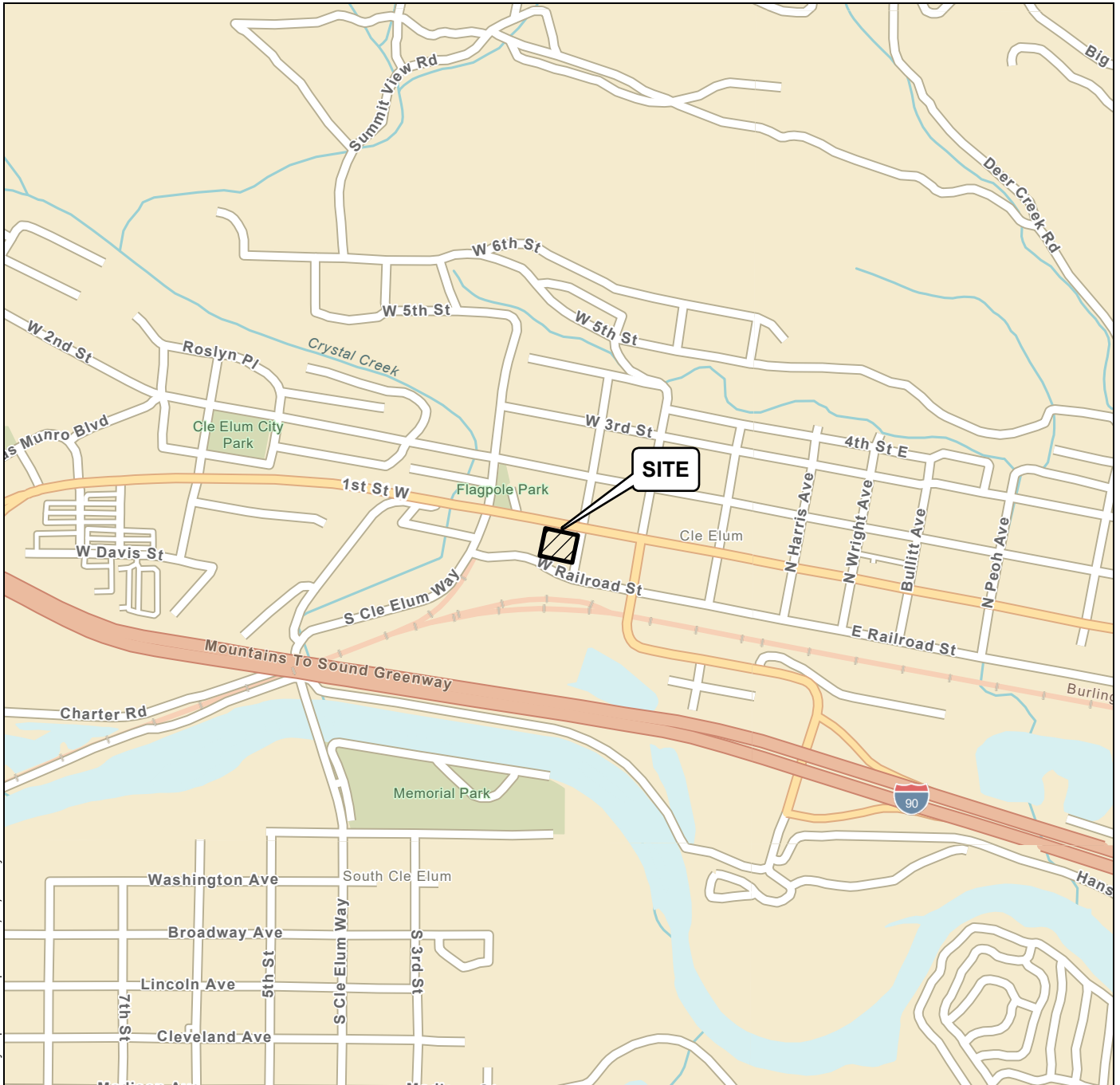
<sup>6</sup>Gasoline-range hydrocarbons when benzene is present / no detectable benzene.

mg/L = milligrams per liter; µg/L = micrograms per liter; NE = not established

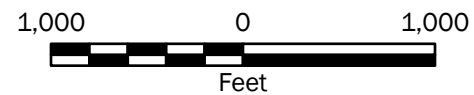
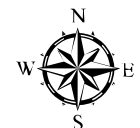
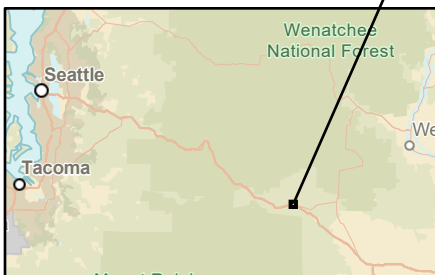
U = analyte was not detected above the laboratory reporting or method detection limit (RL or MDL, respectively).







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**Notes:**

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

Data Source: ESRI

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

<b>Vicinity Map</b>	
Cle Elum City Cle Elum, Washington	
	<b>Figure 1</b>

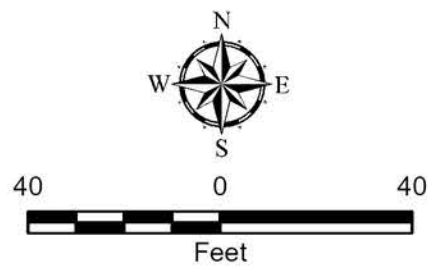




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**Notes:**  
 1. The locations of all features shown are approximate.  
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.  
 3. Locations of 1996 explorations were approximated by centering an electronic image from the 1996 report over field located MW-5 and then electronically stretching the image to match gridded street layout of the figure and recent aerial imagery.  
 Data Source: ESRI Clarity  
 Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

- Legend**
- Approximate location of Historical Exploration (Ecology, 1996)
  - ⊕ Boring Number and Approximate Location
  - Approximate UST Excavation Location
  - ⌈⌋ Timber Lodge Motel



<b>Site Plan</b>	
Cle Elum City Cle Elum, Washington	
	Figure 2



## **APPENDIX A**

### **Boring Logs**



## SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS <small>(LITTLE OR NO FINES)</small>		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS <small>(LITTLE OR NO FINES)</small>		<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND
FINE GRAINED SOILS	SILTS AND CLAYS	SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES
		LIQUID LIMIT LESS THAN 50		<b>ML</b>	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		LIQUID LIMIT LESS THAN 50		<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
		LIQUID LIMIT GREATER THAN 50		<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY	
	LIQUID LIMIT GREATER THAN 50		<b>OH</b>	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY	
	LIQUID LIMIT GREATER THAN 50		<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	
HIGHLY ORGANIC SOILS				<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

### Sampler Symbol Descriptions

	2.4-inch I.D. split barrel
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab
	Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

## ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
	<b>AC</b>	Asphalt Concrete
	<b>CC</b>	Cement Concrete
	<b>CR</b>	Crushed Rock/ Quarry Spalls
	<b>SOD</b>	Sod/Forest Duff
	<b>TS</b>	Topsoil

### Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

### Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

### Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

### Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point load test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

### Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

## Key to Exploration Logs

Start Drilled	5/25/2021	End	5/25/2021	Total Depth (ft)	10	Logged By	JDO	Checked By	JRS	Driller	Cascade Drilling	Drilling Method	Direct Push
Surface Elevation (ft) Vertical Datum	1912 NAVD88			Hammer Data	N/A			Drilling Equipment	GeoProbe 7822DT				
Easting (X) Northing (Y)	1530533 679191			System Datum	WA State Plane North NAD83 (feet)			Groundwater not observed at time of exploration					
Notes: A temporary 1-inch was installed on 5/25/2021 to a depth of 10 feet													

Elevation (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0		48				AC	3 inches of asphalt				
						SP	Brown fine to coarse sand with gravel, trace silt (dense, moist)	NS	2.4		
19.10						GP	White coarse gravel with sand (dense, moist)	NS	<1		
						SM	Brown silty fine sand with occasional gravel (medium dense, moist)	NS	<1		
						GP-GM	Brown fine to coarse gravel with silt and sand (dense, moist)	NS	<1		
5		42					Grades to white				
							Grades to brown				
19.05							Becomes wet				
								NS	<1		
10											

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring GEI037-B-1



Project: Soil and Groundwater Assessment  
Project Location: Cle Elum, Washington  
Project Number: 0504-177-00

Date: 7/15/21 Path: \\GEOENGINEERS.COM\WORK\PROJECTS\0504177\GINT\050417700.GPJ\DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_ENVIRONMENTAL\_STANDARD\_NO\_GW

Drilled	Start 5/25/2021	End 5/25/2021	Total Depth (ft)	10	Logged By Checked By	JDO JRS	Driller	Cascade Drilling	Drilling Method	Direct Push
Surface Elevation (ft) Vertical Datum	1912 NAVD88			Hammer Data	N/A			Drilling Equipment	GeoProbe 7822DT	
Easting (X) Northing (Y)	1530538 679220			System Datum	WA State Plane North NAD83 (feet)			Groundwater not observed at time of exploration		
Notes: A temporary 1-inch was installed on 5/25/2021 to a depth of 10 feet										

Elevation (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing							
0	42					AC	3 inches of asphalt				
						SP	Brown fine to coarse sand with gravel, trace silt (dense, moist)	NS	<1		
19.10						SM	Brown silty fine sand with occasional gravel (medium dense, moist)	NS	<1		
						GP	Brown fine to coarse gravel with sand (dense, moist)	NS	<1		
5	42							NS	7.2		
19.05											
								NS	<1		
							Increased silt content Becomes wet				
10											

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring GEI037-B-2



Project: Soil and Groundwater Assessment  
Project Location: Cle Elum, Washington  
Project Number: 0504-177-00

Figure A-3  
Sheet 1 of 1

Date: 7/15/21 Path: \\GEOENGINEERS.COM\WORK\PROJECTS\0504177\GINT\050417700.GPJ\DLLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_ENVIRONMENTAL\_STANDARD\_NO\_GW



Drilled	Start 5/25/2021	End 5/25/2021	Total Depth (ft)	10	Logged By Checked By	JDO JRS	Driller	Cascade Drilling	Drilling Method	Direct Push
Surface Elevation (ft) Vertical Datum	1912 NAVD88		Hammer Data	N/A			Drilling Equipment	GeoProbe 7822DT		
Easting (X) Northing (Y)	1530540 679238		System Datum	WA State Plane North NAD83 (feet)			Groundwater not observed at time of exploration			
Notes: A temporary 1-inch was installed on 5/25/2021 to a depth of 10 feet										

Elevation (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing							
0	42					AC	3 inches of asphalt				
						SP	Brown fine to coarse sand with gravel, trace silt (dense, moist)	NS	17.3		
19.10						SM	Brown silty fine sand with occasional gravel (dense, moist)	NS	1.5		
						GP	Brown fine to coarse gravel with sand, trace silt (dense, moist)	NS	<1		
5	36			GEI037-B3 (3,5,5) CA				SS	94.7		
19.05							Becomes wet	NS	2.7		
10											

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring GEI037-B3



Project: Soil and Groundwater Assessment  
Project Location: Cle Elum, Washington  
Project Number: 0504-177-00

Figure A-4  
Sheet 1 of 1

Date: 7/15/21 Path: \\GEOENGINEERS.COM\WORK\PROJECTS\0504177\GINT\050417700.GPJ\DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_ENVIRONMENTAL\_STANDARD\_NO\_GW

**APPENDIX B**  
**Work Plan**

## **Work Plan**

Cle Elum City  
Site Assessment  
Cle Elum, Washington

for  
**Washington State Department of Ecology**

May 4, 2021



## **Work Plan**

Cle Elum City  
Site Assessment  
Cle Elum, Washington

*for*

**Washington State Department of Ecology**

May 4, 2021



523 East Second Avenue  
Spokane, Washington 99202  
509.363.3125

**Work Plan**  
**Cle Elum City**  
**Site Assessment**  
**Cle Elum, Washington**

**File No. 0504-177-00**

**May 4, 2021**

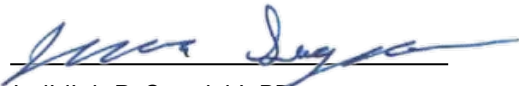
Prepared for:

Washington State Department of Ecology  
Eastern Regional Office  
4601 North Monroe Street  
Spokane, Washington 99205

Attention: Valerie Bound

Prepared by: Justin D. Orr

GeoEngineers, Inc.  
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Principal

JDO:JRS:BDW:mce

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<b>3.0 FIELD INVESTIGATION ACTIVITIES</b> .....	<b>2</b>
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    Table B-2. Methods of Analysis and Practical Quantitation Limits (Soil)

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## 1.0 INTRODUCTION

This Work Plan presents the scope of work and approach to conduct a soil and groundwater assessment at the Cle Elum City site (herein designated the site) located at the southwest corner of 1st Street and Billings Avenue in Cle Elum, Washington, as shown in Vicinity Map, Figure 1. Based on recent aerial imagery, the site is currently occupied by a commercial building (Timber Lodge Inn) and associated paved parking.

This Work Plan has been prepared by GeoEngineers for the State of Washington Department of Ecology (Ecology) under Ecology Master Contract No. C1900044, work assignment number GEI037. The purpose of this assessment is to characterize soil and groundwater contaminants and define the extent of contamination related to a historic fuel release at the site. Data generated from this assessment will support a no further action (NFA) determination or planning potential remedial actions within the defined project area to address ecological and human health risks associated with historical contamination.

A sampling plan, with a description of field assessment procedures is provided in Appendix A; the Quality Assurance Project Plan (QAPP) and the Health and Safety Plan (HASP) are presented as Appendices B and C, respectively. The Work Plan is organized as follows:

- Site Description and Background – Section 2.0
- Field Investigation Activities – Section 3.0
- Schedule – Section 4.0
- References – Section 5.0

## 2.0 SITE DESCRIPTION AND BACKGROUND

Previous site reports indicate petroleum products were encountered at approximately 10 feet below ground surface (bgs) inside a manhole excavation while installing telephone cables in 1991. The site was previously occupied by a Preston Phillips 66 service station. Fuel dispensing pumps were located about 10 feet from the manhole excavation.

In 1996, an environmental site assessment (ESA) was conducted to evaluate the presence of petroleum-related contamination at the site. According to the owners at the time of the site assessment, two 1,000-gallon underground storage tanks (USTs), one 500-gallon UST and fuel dispensing pumps with associated piping were removed when the property changed ownership (Ecology, 1996). One soil boring, SB-5, was advanced and converted into monitoring well MW-5 to evaluate subsurface and groundwater conditions. MW-5 is generally located between the manhole excavation and the former fuel dispensing pumps (Ecology, 1996). The soil sample collected from SB-5 indicated a gasoline concentration of 270 milligrams per kilogram (mg/kg) which is greater than the Model Toxics Control Act (MTCA) Method A cleanup level of 100 mg/kg when benzene is not present. Groundwater monitoring conducted in 1996 indicated that the gasoline concentration in MW-5 (240 micrograms per liter [ $\mu\text{g}/\text{L}$ ]) was less than the MTCA Method A cleanup level at the time (1,000  $\mu\text{g}/\text{L}$ ).

Based on our review of previous site reports and our experience in the area, groundwater is likely to occur at depths ranging from approximately 7 to 9 feet bgs and likely flows to the east. Subsurface soils likely consist of sand and gravel with various amounts of silt.

To assess the potential extent of petroleum contaminated soil and groundwater, we plan to advance soil borings and install temporary well points, collect soil and groundwater samples from these borings, and submit the groundwater samples for laboratory analyses of gasoline-range petroleum hydrocarbons, diesel-range petroleum hydrocarbons, oil-range petroleum hydrocarbons (GRPH, DRPH and ORPH, respectively) and benzene, toluene, ethylbenzene and xylenes (BTEX).

### 3.0 FIELD INVESTIGATION ACTIVITIES

The tasks described below reflect the proposed field activities. The specific tasks conducted at the site may change in response to conditions encountered in the field or as additional information is obtained. Adjustments to the tasks listed will be mutually-agreed upon by Ecology and GeoEngineers and authorized prior to implementation.

Field investigation activities will include the following:

- Coordinate underground utility locating using the State of Washington Utility Notification and Utilities Plus, LLC (Utilities Plus) for private utility locating. Per state regulations, GeoEngineers will mobilize to/from the site from Spokane, Washington to mark the proposed boring locations prior to initiating the locate request.
- Mobilize to/from the site from Spokane, Washington to conduct the sampling event.
- Measure and record the depth to groundwater and the depth of MW-5.
- Redevelop MW-5 (if viable) by surging and purging at least five well casing volumes of water. If MW-5 is purged dry during development, we will adjust the minimum volume of water purged during development, based upon well recovery time and Ecology concurrence.
- Purge MW-5 using low-flow, low stress methods as described in Appendix A. Measure and record water quality parameters including temperature, pH, specific conductivity, dissolved oxygen, oxidation-reduction potential and turbidity.
- Collect a groundwater sample and duplicate from MW-5 per procedures described in Appendix A.
- Conduct 1 day of subsurface assessment using direct-push drilling techniques following receipt of laboratory analytical reports from the monitoring well sampling event above. Following approval by Ecology, we will mobilize to/from the site from Spokane, Washington. The number, location and depth of the borings will depend on field conditions (such as field screening evidence of contamination, accessibility, soil conditions and depth to groundwater). We estimate advancing three borings near the former UST excavation. With Ecology's concurrence, borings will be advanced out from their initial locations if evidence of contamination is encountered. Proposed exploration locations are shown in Site Plan, Figure 2. Soil samples will be collected from 5-foot intervals using a continuous core sampler for field screening and potential chemical analysis. Borings will be advanced to a maximum depth of 15 feet bgs or at least 2 feet below the groundwater interface, whichever is shallower. Soil samples will be collected per procedures described in Appendix A for direct push sampling.
- Observe, field screen and document subsurface soil conditions using a qualified field engineer or geologist. Field screening will consist of visual observation, water sheen testing and headspace vapor measurements using a photoionization detector (PID).



- When groundwater is encountered, then the boring will be advanced a minimum of 2 feet below the groundwater interface and a temporary groundwater sampling point will be installed to collect a grab groundwater sample. A minimum of one duplicate groundwater sample will be obtained for laboratory analysis. Grab groundwater samples will be collected per procedures outlined in Appendix A.
- Backfill borings with bentonite clay and surface completed with gravel, asphalt or concrete patch to match the existing ground surface.
- Submit a minimum of one soil sample and one grab groundwater sample (if groundwater is encountered) from each boring to Eurofins TestAmerica Laboratories [Eurofins TA] of Spokane Valley, Washington for chemical analysis. The soil sample with the greatest field screening indication of potential contamination or the closest sample collected above the groundwater interface, if present, will be submitted for laboratory analysis. Samples will be submitted for analysis under a standard turnaround time (TAT) of 10 business days. Soil and groundwater samples submitted from the site will be analyzed for the following potential contaminants:
  - GRPH using Northwest Method NWTPH-Gx;
  - DRPH and ORPH using Northwest Method NWTPH-Dx; and
  - BTEX using EPA Method 8260D.
- Submit a minimum of one trip blank for soil and one for water (if groundwater is encountered) for analysis of GRPH and BTEX.
- Drum and label investigation-derived waste (IDW). A qualified contractor will be retained to profile and transport the IDW for disposal at a permitted facility if contaminants greater than the respective MTCA Method A cleanup levels are detected in the soil and groundwater samples analyzed by the laboratory. We assume IDW will be nonhazardous if the IDW requires off-site disposal.
- Compare soil and groundwater chemical analysis results to MTCA Method A cleanup levels.
- Prepare a site assessment report that provides field and laboratory data, comparison of the analytical results to MTCA and recommendations. The report will include field procedures, tables, figures and historical information.
- Enter laboratory analytical data results into Ecology's Environmental Information Management (EIM) database.

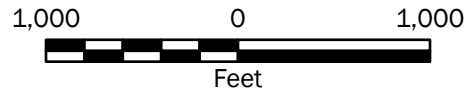
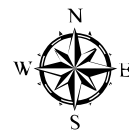
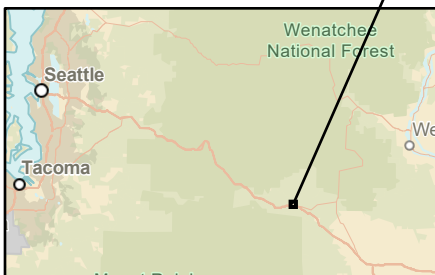
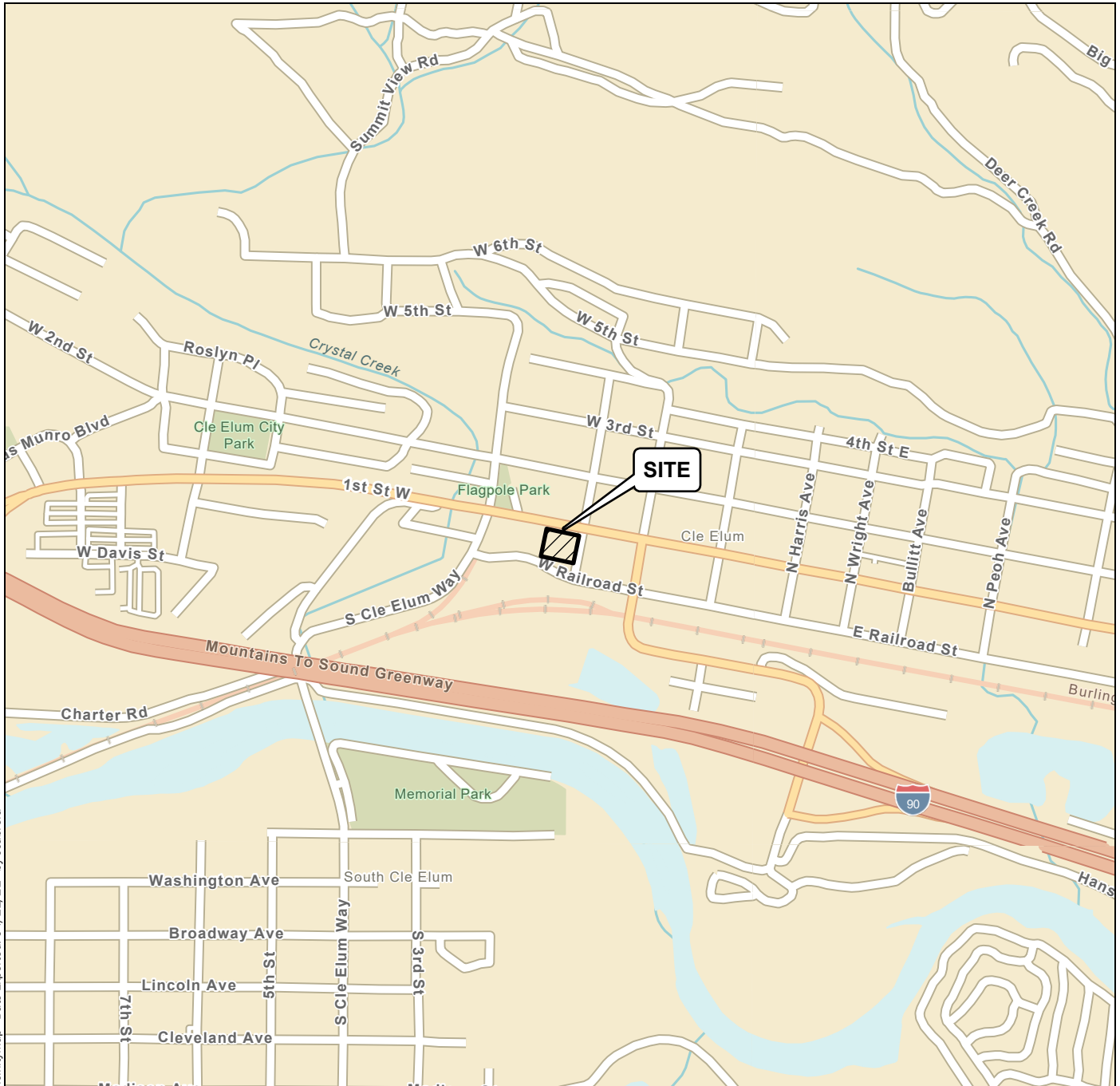
#### **4.0 SCHEDULE**

The fieldwork will be conducted in late April or May 2021 and completed in 3 days. We expect to receive laboratory analytical data within 2 weeks after submitting the samples to the laboratory. Our report will be completed within a month following receipt of analytical data from the laboratory.

#### **5.0 REFERENCES**

State of Washington Department of Ecology (Ecology). 1996. Phase 1 and 2 Environmental Site Assessment, Former and Current Service Stations and Bulk Storage Facilities, Cle Elum, Washington. Dated December 1996.





Vicinity Map

Cle Elum City  
Cle Elum, Washington



Figure 1

Notes:

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

Data Source: ESRI

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

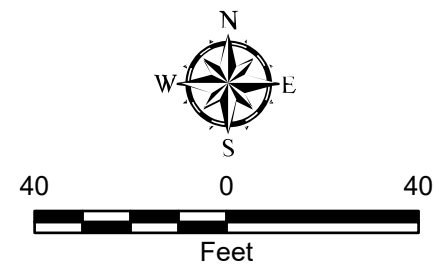




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Data Source: ESRI Clarity

- Approximate Monitoring Well Location
- ⊕ Exploration Location
- Approximate UST Excavation Location
- ⌚ Timber Lodge Motel



<b>Site Plan</b>	
Cle Elum City Cle Elum, Washington	
	<b>Figure 2</b>



**APPENDIX A**  
**Field Assessment Procedures**

## **APPENDIX A ASSESSMENT PROCEDURES**

### **STANDARD PROCEDURES**

This section contains standard procedures for field data collection that are anticipated during the site assessment at the Cle Elum City site in Cle Elum, Washington including the following:

- Collecting soil samples from direct-push soil borings;
- Groundwater sampling (if encountered);
- Field screening methods;
- Decontamination procedures;
- Handling of investigation-derived waste (IDW);
- Sample location control;
- Field measurement and observation documentation; and
- Sample identification.

#### **Collecting Soil Samples from Soil Borings**

Drilling will be conducted by a State of Washington licensed driller and supervised by a trained GeoEngineers field engineer or geologist. Soil samples will be collected continuously during drilling (direct-push) using 5-foot acrylic slip-sleeve samplers.

Each boring will be monitored by a GeoEngineers field representative to observe and classify the soil encountered and prepare a detailed log of each boring. Soil encountered in the borings will be classified in the field in general accordance with ASTM International (ASTM) D2488-17, the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

Soil samples from each sampling interval will be field screened for the presence of contaminants using the procedures described below to determine which sample will be for chemical analysis. Based on field indicators, a minimum of one soil sample from each boring exhibiting the greatest level of contamination as indicated by field screening will be submitted for laboratory analysis. Additional samples might be submitted based on field screening results and as approved by the Washington State Department of Ecology (Ecology).

Soil selected for analysis will be removed from the sampler using a new or decontaminated soil knife or clean nitrile gloves, transferred into a laboratory-prepared container, labeled with a waterproof pen and placed on “blue ice” or wet ice in a clean plastic-lined cooler. Each sample will be documented on a boring log and chain-of-custody (COC) and will include sample name, sample collection date and time, sample type, sample depth (relative to ground surface), requested analyses and sampler name. Soil samples for volatile organic compound (VOC) analyses (e.g., benzene, toluene, ethylbenzene and xylenes [BTEX]) will be collected consistent with Environmental Protection Agency (EPA) Method 5035A (EPA 2002) and preserved in accordance with Ecology Implementation Memorandum 5 (Ecology 2004) and EPA (1998).



Sampling equipment will be decontaminated between each sampling attempt as described in the Decontamination Procedures Section. The sample coolers will be delivered to the analytical laboratory under standard COC procedures described in the Quality Assurance Project Plan (QAPP) (Appendix B).

### **Groundwater Sampling**

Groundwater will be collected from the existing monitoring well (following redevelopment) and as a grab sample (if encountered) from the direct-push soil borings.

### **Well Redevelopment**

Existing groundwater monitoring wells will be redeveloped to remove potential material that has accumulated since the last sampling event, stabilize the filter pack and formation materials surrounding the well screen, and restore the hydraulic connection between the well screen and the surrounding soil. Each well will be redeveloped by surging and bailing with a stainless-steel bailer. Surging will be conducted slowly to reduce disruption to the filter pack and screen.

The depth to water in the groundwater monitoring well will be measured prior to redevelopment. Well development will continue until the water is as free of sediment as practicable with respect to the composition of the subsurface materials within the screened interval. The removal rate, depth to water and volume of groundwater removed will be recorded during well redevelopment procedures. Well redevelopment water will be stored in a 55-gallon drum on the site, pending analysis and disposal.

Bailers used to develop more than one well will be decontaminated by wiping with a detergent such as Simple Green and washing with a Liquinox® solution, followed by a potable water rinse and distilled water rinse. Sampling will proceed in developed wells no sooner than 48 hours following development.

### **Depth to Groundwater**

Depth to groundwater measurements from site monitoring wells will be collected and recorded on the field forms. Depth to groundwater relative to the north side of the top of the well casing will be measured to the nearest 0.01 foot using an electronic water-level indicator and recorded in the field notebook. Product thickness (if any) will be measured with an oil-water interface probe and recorded in the field notebook. The electronic water-level indicator will be decontaminated with Liquinox® solution wash and a distilled water rinse prior to use in each well.

### **Well Sampling**

Following depth-to-groundwater measurement, a groundwater sample will be collected from each well consistent with the EPA's low-flow groundwater sampling procedure, as described in EPA (2017) and Puls and Barcelona (1996). Dedicated tubing and a peristaltic pump will be used for groundwater purging and sampling. During purging activities, water quality parameters, including pH, temperature, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP) and turbidity, will be measured using a multi-parameter meter equipped with a flow-through cell. Groundwater samples will be collected after (1) water quality parameters stabilize; or (2) a maximum purge time of 30 minutes is reached. During purging and sampling, drawdown will not be allowed to exceed 0.3 feet, if possible, and the purge rate will not be allowed to exceed 400 milliliters per minute. Water quality parameter stabilization criteria will include the following:

- Turbidity:  $\pm 10$  percent for values greater than 5 nephelometric turbidity units;
- Conductivity:  $\pm 3$  percent;



- pH:  $\pm 0.1$  unit;
- Temperature:  $\pm 3$  percent; and
- DO:  $\pm 10$  percent for values greater than 0.5 milligrams per liter.

Samples will not be collected from the well if it has measurable ( $>0.1$  inches) free product. Field water quality measurements and depth-to-water measurements will be recorded on a Well Purging-Field Water Quality Measurement Form. Groundwater samples will be transferred in the field to laboratory-prepared sample containers and kept cool during transport to the testing laboratory. Chain-of-custody procedures will be observed from the time of sample collection to delivery to the testing laboratory consistent with the QAPP (Appendix B)

### **Groundwater Grab Sampling**

If groundwater is encountered in the soil borings, grab samples will be collected and analyzed. Depth to groundwater relative to the top of the drill casing will be measured to the nearest 0.01 foot using an electronic water-level indicator as with sampling from a monitoring well (see previous Depth to Groundwater Section) and recorded in the field notes. The water level-indicator will be decontaminated with Liquinox<sup>®</sup> solution wash and a distilled water rinse prior to use in each boring.

Following depth to groundwater measurement, a groundwater sample will be collected from the open boring consistent with the EPA's low-flow groundwater sampling procedure, as described in EPA (2017) and Puls and Barcelona (1996). Dedicated tubing and a peristaltic pump will be used for groundwater purging and sampling. Each boring will be purged for approximately 15 minutes before collecting the sample. During purging activities, water quality parameters, including pH, temperature, conductivity, DO, ORP and turbidity, will be measured using a multi-parameter meter equipped with a flow-through cell.

Samples will not be collected from the boring if it has measurable free product. Field water quality measurements and depth-to-water measurements will be recorded on a Well Purging-Field Water Quality Measurement Form. Groundwater samples will be transferred in the field to laboratory-prepared sample containers and kept cool during transport to the testing laboratory. COC procedures will be observed from the time of sample collection to delivery to the testing laboratory consistent with the QAPP.

### **Field Screening Methods**

Field screening methods will be used to select samples for laboratory chemical analysis.

A GeoEngineers field representative will perform visual and physical field screening tests on soil samples and record the observations on the field boring log and in the field notebook. Field screening results will be used to aid in the selection of soil samples for chemical analysis. The sample from each boring showing the highest likelihood of petroleum contamination, based on field screening, will be selected for laboratory analysis. The remaining samples might be submitted to the laboratory and held, pending the results of the samples submitted for analysis.

Screening methods will include (1) visual examination; (2) water-sheen screening; and (3) headspace vapor screening using a photo-ionization detector (PID). Visual screening consists of inspecting the soil for discoloration indicative of the presence of petroleum-impacted material in the sample.

Water-sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen classifications are as follows:

- **No Sheen (NS)** No visible sheen on the water surface;
- **Slight Sheen (SS)** Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly. Natural organic matter in the soil might produce a slight sheen;
- **Moderate Sheen (MS)** Light to heavy sheen; might have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on water surface; and
- **Heavy Sheen (HS)** Heavy sheen with color/iridescence; spread is rapid; entire water surface might be covered with sheen.

Water sheen testing equipment will be disposable or decontaminated before field screening each sample using a Liquinox® soap solution with a water rinse. Used testing equipment and/or decontamination water will be stored on-site in a labeled Washington State Department of Transportation (DOT)-approved drum pending disposal with other IDW.

Headspace vapor screening involves placing a soil sample into a sealed plastic bag and measuring the airspace VOC vapor concentrations in parts per million (ppm) with a PID. Once a soil sample is placed in a sealed plastic bag with air space, the bag is shaken to expose the soil to the air trapped in the bag. The probe of the PID, calibrated to isobutylene following the manufacturer's instructions, is inserted into a small opening in the bag seal and the VOC concentration is measured. The PID typically is designed to quantify VOC vapor concentrations in the range between 1 and 2,000 ppm with an accuracy of  $\pm 10$  percent of the reading, and between 2,000 and 10,000 ppm with an accuracy of  $\pm 20$  percent of the reading.

### Decontamination Procedures

The objective of the decontamination procedures described herein is to minimize the potential for cross-contamination between sample locations. A designated decontamination area will be established for decontamination of drilling equipment and reusable sampling equipment. Drilling equipment will be cleaned by water jetting using high-pressure/low-volume cleaning equipment.

Sampling equipment will be decontaminated in accordance with the following procedures before each sampling attempt or measurement.

1. Brush equipment with a nylon brush to remove large particulate matter.
2. Rinse with potable tap water.
3. Wash with non-phosphate detergent solution (Liquinox® and potable tap water).
4. Rinse with potable tap water.
5. Rinse with distilled water.

### Handling of IDW

IDW, which consists mainly of drill cuttings and decontamination/purge water, typically will be placed in DOT-approved 55-gallon drums. Each drum will be labeled with the project name, general contents and

date. The drummed IDW will be stored on site at a location approved by the site owner, pending analysis and disposal.

Disposable items, such as sample tubing, disposable bailers, bailer line, gloves and protective overalls, paper towels, etc., will be placed in plastic bags after use and deposited in trash receptacles for disposal.

### **Sample Location Control**

Horizontal sample control will be maintained throughout the project. Horizontal control will be established using measuring tapes or a hand-held global positioning system (GPS) meter accurate to approximately  $\pm 15$  lateral feet. Boring locations also will be established by measuring their distance relative to permanent site features.

### **Sample Handling and Custody Requirements**

Samples will be handled in accordance with the QAPP (Appendix B). A complete discussion of the sample identification and custody procedures is provided in the QAPP.

### **Field Measurements and Observations Documentation**

Field measurements and observations will be recorded in a project field notebook. Daily logs will be dated, and pages will be consecutively numbered. Entries will be recorded directly and legibly in the daily log and signed and dated by the person conducting the work. If changes are made, the changes will not obscure the previous entry, and the changes will be signed and dated. At a minimum, the following data will be recorded in the log book:

- Purpose and location of investigation;
- Location of activity;
- Site or sampling area sketch showing sample locations and distances to fixed reference points;
- Date and time of sampling;
- Type of sample (matrix);
- Designation as a discrete or composite sample;
- Sample identification number (should match with what is on jar and COC);
- Soil sample top and bottom depth (below ground surface [bgs]);
- Sample preservation (if any);
- Sampling equipment used;
- Field measurements and screening observations (e.g., odor, color, staining, sheens, etc.);
- Field conditions that are pertinent to the integrity of the samples (e.g., weather conditions, performance of the sampling equipment, sample depth control, sample disturbance, etc.);
- Relevant comments regarding field activities; and
- Shipping arrangements (including overnight air bill number, if applicable) and receiving laboratory.

Information will be recorded in the log book with enough detail so that field activities can be reconstructed without reliance on personnel memory. In addition to the sampling information, the following specific information also will be recorded in the field log for each day of sampling:

- Team members and their responsibilities;
- Time of arrival/entry on site and time of site departure;
- Other personnel present at the site;
- Summary of pertinent meetings or discussions with regulatory agency or contractor personnel;
- Deviations from sampling plans, site safety plans and QAPP procedures;
- Changes in personnel and responsibilities with reasons for the changes;
- Levels of safety protection; and
- Calibration readings for any equipment used and equipment model and serial number.

### **Sample Identification**

Sample identification is important to provide concise data management and to quickly determine sample location and date when comparing multiple samples. Soil samples for each site will adhere to the following general format:

#### **Site Number - Location ID (Depth)**

Site numbers are established by Ecology's work assignment number in the format GEI037. For example, a soil sample collected at the Cle Elum City site (work assignment No. GEI037) at boring location B1 at a depth interval of 5 to 6 feet shall be labeled as GEI037-B1(5-6).

Grab groundwater samples will have the following general format:

#### **Site Number-Location ID-Date**

For example, groundwater sampled from boring location B1 at the Cle Elum City site on May 1, 2021 will be labeled as GEI037-B1-050121.

Groundwater sampled from wells will be labelled similarly, with the well number replacing the location number. Following the example above, groundwater sampled from MW-05 will be labelled as GEI037-MW05-050121.

### **REFERENCES**

ASTM D2488. 2017. Standard Practice for Description and Identification of Soils (Visual-Manual Procedures).

Puls, R. W. and M.J. Barcelona. 1996. "Low-flow (Minimal Drawdown) Ground-water Sampling Procedures." EPA Ground Water Issue. April. p.1-9.

U.S. Environmental Protection Agency. 2017. Region 1, “Low Stress (Low-Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells.” EPA SOP No. GW4, Revision No. 4., September 19, 2017.

U.S. Environmental Protection Agency. 1998. “Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW\_846).” Revision 5, April.

U.S. Environmental Protection Agency. 2002. Method 5035A (SW-846). Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. Draft Revision 1. Washington, D.C. July 2002.

U.S. Environmental Protection Agency. 2007. Method 6200 (SW-846). Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in soil and Sediment. Washington, D.C. February 2007.

Washington State Department of Ecology. 2004. “Collecting and Preparing Soil Samples for VOC Analysis.”

**APPENDIX B**  
**Quality Assurance Project Plan**

## **APPENDIX B**

### **QUALITY ASSURANCE PROJECT PLAN**

This Quality Assurance Project Plan (QAPP) was developed to guide laboratory analyses for soil and groundwater samples collected as part of the Cle Elum City site assessment conducted for the Washington State Department of Ecology (Ecology) under Ecology Contract C1900044, individual work assignment GEI037. The QAPP presents the objectives, procedures, organization, functional activities and specific Quality Assurance (QA) and Quality Control (QC) activities designed to achieve data quality goals established for the projects. This QAPP is based on Ecology guidelines (Ecology 2016) and the Environmental Protection Agency (EPA) Requirements for Quality Assurance Project Plans (EPA 2001) and related guidelines (EPA 2002).

Throughout the projects, environmental measurements will be conducted to produce data that are scientifically valid, of known and acceptable quality and meet established objectives. QA/QC procedures will be implemented so that precision, accuracy, representativeness, completeness and comparability (PARCC) of data generated meet the specified data quality objectives to the extent possible.

### **PROJECT ORGANIZATION AND RESPONSIBILITY**

Descriptions of the responsibilities, lines of authority and communication for the key positions to QA/QC are provided below. This organization facilitates the efficient production of project work, allows for an independent quality review and permits resolution of QA issues before submittal.

#### **Project Leadership and Management**

The Project Manager's (PM) duties consist of providing concise technical work statements for project tasks, selecting project team members, determining subcontractor participation, establishing budgets and schedules, adhering to budgets and schedules, providing technical oversight, and providing overall production and review of project deliverables. Jedidiah R. Sugalski, Professional Engineer (PE) is the PM for activities at the site. The Principal-in-Charge, Bruce Williams, is responsible to Ecology for fulfilling contractual and administrative control of the project.

#### **Field Coordinator**

The Field Coordinator is responsible for the daily management of activities in the field. Specific responsibilities include the following:

- Provides technical direction to the field staff.
- Develops schedules and allocates resources for field tasks.
- Coordinates data collection activities to be consistent with information requirements.
- Supervises the compilation of field data and laboratory analytical results.
- Assures that data are correctly and completely reported.
- Implements and oversees field sampling in accordance with project plans.
- Supervises field personnel.
- Coordinates work with on-site subcontractors.

- Schedules sample shipment, if necessary, with the analytical laboratory.
- Monitors that appropriate sampling, testing and measurement procedures are followed.
- Coordinates the transfer of field data, sample tracking forms and log books to the PM for data reduction and validation.
- Participates in QA corrective actions, as required.

The Field Coordinator for each work assignment will be drawn from our pool of experienced staff, since fieldwork will be conducted concurrently at multiple sites. Staff that will serve as Field Coordinator could include Joshua Lee, Bryce Hanson or Justin Orr.

### **QA Leader**

The GeoEngineers QA Leader is under the direction of Jedidiah Sugalski and Bruce Williams, who are responsible for the project's overall QA. The QA Leader is responsible for coordinating QA/QC activities, as they relate to the acquisition of field data. Denell Warren is the QA Leader. The QA Leader has the following responsibilities:

- Serves as the official contact for laboratory data QA concerns.
- Responds to laboratory data, QA needs, resolves issues, and answers requests for guidance and assistance.
- Reviews the implementation of the QAPP and the adequacy of the data generated from a quality perspective.
- Maintains the authority to implement corrective actions, as necessary.
- Reviews and approves the laboratory QA Plan.
- Evaluates the laboratory's final QA report for any condition that adversely impacts data generation.
- Ensures that appropriate sampling, testing and analysis procedures are followed and that correct QC checks are implemented.
- Monitors subcontractor compliance with data quality requirements.

### **Laboratory Management**

The Ecology-accredited subcontracted laboratory (Eurofins TestAmerica Laboratories [Eurofins TA] of Spokane Valley, Washington) conducting sample analyses for this project is required to obtain approval from the QA Leader before the initiation of sample analysis to assure that the laboratory QA plan complies with the project QA objectives. The Laboratory's QA Coordinator (Ranee Arrington) administers the Laboratory QA Plan and is responsible for QC. Specific responsibilities of this position include:

- Ensures implementation of the QA Plan.
- Serves as the laboratory point of contact.
- Activates corrective action for out-of-control events.
- Issues the final laboratory QA/QC report.
- Administers QA sample analysis.



- Complies with the specifications established in the project plans as related to laboratory services.
- Participates in QA audits and compliance inspections.

## **DATA QUALITY OBJECTIVES**

The QA objective for technical data is to collect environmental monitoring data of known, acceptable and documentable quality. The QA objectives established for the project are:

- Implement the procedures outlined herein for field sampling, sample custody, equipment operation and calibration, laboratory analysis, and data reporting that will facilitate consistency and thoroughness of data generated.
- Achieve the acceptable level of confidence and quality required so that data generated are scientifically valid and of known and documented quality. This will be performed by establishing criteria for PARCC, and by testing data against these criteria.

The sampling design, field procedures, laboratory procedures and QC procedures are set up to provide high-quality data for use in this project. Specific data quality factors that may affect data usability include quantitative factors (precision, bias, accuracy, completeness and reporting limits) and qualitative factors (representativeness and comparability). The measurement quality objectives (MQO) associated with these data quality factors are summarized in Tables B-1 (soil) and B-2 (groundwater) and are discussed below.

## **Analytes and Matrices of Concern**

Samples of soil and/or groundwater will be collected from up to 10 direct-push explorations during the assessment. Tables B-3 (soil) and B-4 (groundwater) summarize the analyses to be performed at the site for soil and groundwater, respectively.

## **Detection Limits**

Analytical methods have quantitative limitations at a given statistical level of confidence that are often expressed as the method detection limit (MDL). Individual instruments often can detect but not accurately quantify compounds at concentrations lower than the MDL, referred to as the instrument detection limit (IDL). Although results reported near the MDL or IDL provide insight to site conditions, QA dictates that analytical methods achieve a consistently reliable level of detection known as the practical quantitation limit (PQL). The contract laboratory will provide numerical results for all analytes and report them as detected above the PQL or undetected at the PQL.

Achieving a stated detection limit for a given analyte is helpful in providing statistically useful data. Intended data uses, such as comparison to numerical criteria or risk assessments, typically dictate specific project target reporting limits (TRLs) necessary to fulfill stated objectives. The PQL for contaminants of potential concern (COPCs) at the site is presented in Tables B-1 and B-2 for soil and groundwater, respectively. These reporting limits were obtained from Eurofins TA, the Ecology-accredited lab that will be analyzing the samples. Other criteria include State of Washington (WAC 173-201) water quality criteria and federal ambient water quality criteria (AWQC). The analytical methods and processes selected will provide PQLs less than the TRLs under ideal conditions. However, the reporting limits in Tables B-1 through B-2 are considered targets because several factors may influence final detection limits. First, moisture and other

physical conditions of soil affect detection limits. Second, analytical procedures may require sample dilutions or other practices to accurately quantify a particular analyte at concentrations above the range of the instrument. The effect is that other analytes could be reported as undetected but at a value much higher than a specified TRL. Data users must be aware that high non-detect values, although correctly reported, can bias statistical summaries and careful interpretation is required to correctly characterize site conditions.

## Precision

Precision is the measure of mutual agreement among replicate or duplicate measurements of an analyte from the same sample and applies to field duplicate or split samples, replicate analyses and duplicate spiked environmental samples (matrix spike duplicates). The closer the measured values are to each other, the more precise the measurement process. Precision error may affect data usefulness. Good precision is indicative of relative consistency and comparability between different samples. Precision will be expressed as the relative percent difference (RPD) for spike sample comparisons of various matrices and field duplicate comparisons for water samples. This value is calculated by:

$$RPD(\%) = \frac{|D_1 - D_2|}{(D_1 + D_2)/2} \times 100,$$

Where

- D<sub>1</sub> = Concentration of analyte in sample.
- D<sub>2</sub> = Concentration of analyte in duplicate sample.

The calculation applies to split samples, replicate analyses, duplicate spiked environmental samples (matrix spike duplicates) and laboratory control duplicates. The RPD will be calculated for samples and compared to the applicable criteria. Precision can also be expressed as the percent difference (%D) between replicate analyses. Persons performing the evaluation must review one or more pertinent documents (EPA 2017a,b) that address criteria exceedances and courses of action. Relative percent difference goals for this effort are 30 percent in groundwater and 40 percent in soil for all analyses, unless the duplicate sample values are within 5 times the reporting limit. In this case, the absolute difference is used instead of the RPD. The absolute difference control limit is equal to the lowest reporting limit of the two samples for water and two times the lowest reporting limit of the two samples for soil.

## Accuracy

Accuracy is a measure of bias in the analytic process. The closer the measurement value is to the true value, the greater the accuracy. This measure is defined as the difference between the reported value versus the actual value and is often measured with the addition of a known compound to a sample. The amount of known compound reported in the sample, or percent recovery, assists in determining the performance of the analytical system in correctly quantifying the compounds of interest. Since most environmental data collected represent one point spatially and temporally rather than an average of values, accuracy plays a greater role than precision in assessing the results. In general, if the percent recovery is low, non-detect results may indicate that compounds of interest are not present when in fact, these compounds are present. Detected compounds may be biased low or reported at a value less than actual environmental conditions. The reverse is true when recoveries are high. Non-detect values are considered accurate while detected results may be higher than the true value.

Accuracy will be expressed as the percent recovery of a surrogate compound (also known as “system monitoring compound”), a matrix spike (MS) result, or from a standard reference material where:

$$Recovery (\%) = \frac{Sample\ Result}{Spike\ Amount} \times 100$$

Persons performing the evaluation must review one or more pertinent documents (EPA 2017a,b) that address criteria exceedances and courses of action. Accuracy criteria for surrogate spikes, MS and laboratory control spikes (LCS) are found in Tables B-1 and B-2 of this QAPP.

### **Representativeness, Completeness and Comparability**

Representativeness expresses the degree to which data accurately and precisely represent the actual site conditions. The determination of the representativeness of the data will be performed by completing the following:

- Comparing actual sampling procedures to those delineated within the Work Plan and this QAPP.
- Comparing analytical results of field duplicates to determine the variations in the analytical results.
- Invalidating non-representative data or identifying data to be classified as questionable or qualitative. Only representative data will be used in subsequent data reduction, validation and reporting activities.

Completeness establishes whether a sufficient amount of valid measurements were obtained to meet project objectives. The number of samples and results expected establishes the comparative basis for completeness. Completeness goals are 90 percent useable data for samples/analyses planned. If the completeness goal is not achieved, an evaluation will be made to determine if the data are adequate to meet study objectives.

Comparability expresses the confidence with which one set of data can be compared to another. Although numeric goals do not exist for comparability, a statement on comparability will be prepared to determine overall usefulness of data sets, following the determination of both precision and accuracy.

### **Holding Times**

Holding times are defined as the time between sample collection and extraction, sample collection and analysis, or sample extraction and analysis. Some analytical methods specify a holding time for analysis only. For many methods, holding times may be extended by sample preservation techniques in the field. If a sample exceeds a holding time, then the results may be biased low. For example, if the extraction holding time for volatile analysis of soil sample is exceeded, then the possibility exists that some of the organic constituents have volatilized from the sample or degraded. Results for that analysis will be qualified as estimated to indicate that the reported results may be lower than actual site conditions. Holding times are presented in Tables B-3 and B-4.

### **Blanks**

According to the *National Functional Guidelines for Organic Data Review* (EPA 2017b), “The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. The criteria for evaluation of blanks apply to any blank associated with the samples (e.g., method blanks, instrument blanks, trip blanks and equipment blanks).” Trip blanks are

placed with samples during shipment; method blanks are created during sample preparation and follow samples throughout the analysis process.

Analytical results for blanks will be interpreted in general accordance with *National Functional Guidelines for Organic Data Review* and professional judgment.

## **SAMPLE COLLECTION, HANDLING AND CUSTODY**

Sampling procedures are provided in Section 3 and Appendix A of this Work Plan.

### **Sampling Equipment Decontamination**

Sampling equipment decontamination procedures are described in Appendix A of the Work Plan.

### **Sample Containers and Labeling**

The Field Coordinator will establish field protocol to manage field sample collection, handling and documentation. Soil and groundwater samples obtained during this study will be placed in appropriate laboratory-prepared containers. Sample containers and preservatives are listed in Tables B-3 and B-4.

Sample containers will be labeled with the following information at the time of collection:

- Project name and number;
- Sample name, which will include a reference to depth if appropriate; and
- Date and time of collection.

The sample collection activities will be noted in the field log books. The Field Coordinator will monitor consistency between the Work Plan, sample containers/labels, field log books and the chain-of-custody (COC).

### **Sample Storage**

Samples will be placed in a cooler with “blue ice” or double-bagged “wet ice” immediately after they are collected. The objective of the cold storage will be to attain a sample temperature of 4 degrees Celsius. Holding times will be observed during sample storage. Holding times for the project analyses are summarized in Tables B-3 and B-4.

### **Sample Shipment**

The samples will be transported and delivered to the analytical laboratory in the coolers. Field personnel will transport and hand-deliver samples that are being submitted to a local laboratory for analysis. Samples that are being submitted from a remote location for analysis will be transported by a commercial express mailing service on an overnight basis or returning field personnel. The Field Coordinator will monitor that the shipping container (cooler) has been properly secured using clear packing tape and custody seals.

Measures will be implemented to minimize the potential for sample breakage, which includes packaging materials and placing sample bottles in the cooler in a manner intended to minimize damage. Sample

bottles will be wrapped with bubble wrap or other protective material before being placed in coolers. Trip blanks will be included in coolers with groundwater samples.

### **Chain-of-Custody Records**

Field personnel are responsible for the security of samples from the time the samples are taken until the samples have been received by the shipper or laboratory. A COC form will be completed at the end of each field day for samples being shipped to the laboratory. Information to be included on the COC form includes:

- Project name and number.
- Sample identification number.
- Date and time of sampling.
- Sample matrix (soil, water, etc.) and number of containers from each sampling point, including preservatives used.
- Depth of subsurface soil sample.
- Analyses to be performed.
- Names of sampling personnel and transfer of custody acknowledgment spaces.
- Shipping information including shipping container number.

The original COC record will be signed by a member of the field team and bear a unique tracking number. Field personnel shall retain carbon copies and place the original and remaining copies in a sealed plastic bag, placed within the cooler or taped to the inside lid of the cooler before sealing the container for shipment. This record will accompany the samples during transit by carrier to the laboratory.

### **Laboratory Custody Procedures**

The laboratory will follow their standard operating procedures (SOPs) to document sample handling from time of receipt (sample log-in) to reporting. Documentation will include at a minimum, the analyst's name or initial, time and date.

## **CALIBRATION PROCEDURES**

### **Field Instrumentation**

Equipment and instrumentation calibration facilitate accurate and reliable field measurements. Field and laboratory equipment used on the project will be calibrated and adjusted in general accordance with the manufacturer's recommendations. Methods and intervals of calibration and maintenance will be based on the type of equipment, stability characteristics, required accuracy, intended use and environmental conditions. The basic calibration frequencies are described below.

The photoionization detector (PID) used for vapor measurements will be calibrated daily, if required (based on the model used), for site safety monitoring purposes in general accordance with the manufacturer's specifications. If daily calibration is not required for a specific PID model, calibration of the PID will be checked to make sure it is up to date. The calibration results will be recorded in the field log book.

## Laboratory Instrumentation

For analytical chemistry, calibration procedures will be performed in general accordance with the methods cited and laboratory SOPs. Calibration documentation will be retained at the laboratory and readily available for a period of 6 months.

## DATA REPORTING AND LABORATORY DELIVERABLES

Laboratories will report data in formatted hardcopy and digital form. Analytical laboratory measurements will be recorded in standard formats that display, at a minimum, the field sample identification, the laboratory identification, reporting units, qualifiers, analytical method, analyte tested, analytical result, extraction and analysis dates, and detection limit (PQL only). Each sample delivery group will be accompanied by sample receipt forms and a case narrative identifying data quality issues. Laboratory electronic data deliverable (EDD) formats will be established by GeoEngineers, Inc., with the contract laboratory. Final results will be sent to the PM.

Chromatograms will be provided for samples analyzed by Northwest Methods NWTPH-Gx. The laboratory will assure the full heights of all peaks appear on the chromatograms and the same horizontal time scale is used to allow for comparisons to other chromatograms.

## INTERNAL QC

Table B-5 summarizes the types and frequency of QC samples to be collected during the site characterization, including both field QC and laboratory QC samples.

### Field QC

Field QC samples serve as a control and check mechanism to monitor the consistency of sampling methods and the influence of off-site factors on environmental samples. Off-site factors include airborne volatile organic compounds (VOCs) and potable water used in drilling activities.

### Field Duplicates

In addition to replicate analyses performed in the laboratory, field duplicates also serve as measures for precision. Under ideal field conditions, field duplicates (referred to as splits), are created when a volume of the sample matrix is thoroughly mixed, placed in separate containers and identified as different samples. Analysis of duplicates test both the precision and consistency of laboratory analytical procedures and methods, and the consistency of the sampling techniques used by field personnel.

One field duplicate will be collected during each groundwater sampling event, including groundwater samples collected from direct-push borings. The duplicate sample will be analyzed for the COPCs specified for the given well.

### Trip Blanks

Trip blanks will accompany soil and groundwater sample containers submitted for VOC analyses during shipment and sampling periods. Trip blanks will be analyzed on a one per cooler basis.

## Laboratory QC

Laboratory QC procedures will be evaluated through a formal data validation process. The analytical laboratory will follow standard method procedures that include specified QC monitoring requirements. These requirements will vary by method but generally include:

- Method blanks
- Internal standards
- Calibrations
- MS/matrix spike duplicates (MSD)
- LCS/laboratory control spike duplicates (LCSD)
- Laboratory replicates or duplicates
- Surrogate spikes

## Laboratory Blanks

Laboratory procedures employ the use of several types of blanks but the most commonly used blank for QA/QC assessments are method blanks. Method blanks are laboratory QC samples that consist of either a soil-like material having undergone a contaminant destruction process or high-performance liquid-chromatography (HPLC) water. Method blanks are extracted and analyzed with each batch of environmental samples undergoing analysis. Method blanks are particularly useful during volatiles analysis since VOCs can be transported in the laboratory through the vapor phase. If a substance is found in the method blank, then one (or more) of the following occurred:

- Measurement apparatus or containers were not properly cleaned and contained contaminants.
- Reagents used in the process were contaminated with a substance(s) of interest.
- Contaminated analytical equipment was not properly cleaned.
- Volatile substances in the air with high solubility or affinities toward the sample matrix contaminated the samples during preparation or analysis.

It is difficult to determine which of the above scenarios took place if blank contamination occurs. However, it is assumed that the conditions that affected the blanks also likely affected the project samples. Given method blank results, validation rules assist in determining which substances in samples are considered “real,” and which ones are attributable to the analytical process. Furthermore, the guidelines state, “. . . there may be instances where little or no contamination was present in the associated blank, but qualification of the sample is deemed necessary. Contamination introduced through dilution water is one example.”

## Calibrations

Several types of calibrations are used, depending on the method, to determine whether the methodology is ‘in control’ by verifying the linearity of the calibration curve and to assure that the sample results reflect accurate and precise measurements. The main calibrations used are initial calibrations, daily calibrations and continuing calibration verification.

## **MS/MSD**

MS/MSD samples are used to assess influences or interferences caused by the physical or chemical properties of the sample itself. For example, extreme pH affects the results of semivolatile organic compounds (SVOCs). Or, the presence of a compound may interfere with accurate quantitation of another analyte. MS/MSD data is reviewed in combination with other QC monitoring data to determine matrix effects. In some cases, matrix effects cannot be determined due to dilution and/or high levels of related substances in the sample. A MS is evaluated by spiking a known amount of one or more of the target analytes ideally at a concentration of 5 to 10 times higher than the sample result. A percent recovery is calculated by subtracting the sample result from the spike result, dividing by the spiked amount and multiplying by 100.

The samples for the MS and MSD analyses should be collected from a boring or sampling location that is believed to exhibit low-level contamination. A sample from an area of low-level contamination is needed because the objective of MS/MSD analyses is to determine the presence of matrix interferences, which can best be achieved with low levels of contaminants. Additional sample volume will be collected for these analyses. This MS/MSD sample will be a composite to achieve a level of representativeness and reproducibility in the data.

## **LCS/LCSD**

Also known as blanks spikes, LCSs are similar to MSs in that a known amount of one or more of the target analytes are spiked into a prepared media and a percent recovery of the spiked substances are calculated. The primary difference between a MS and LCS is that the LCS media is considered “clean” or contaminant free. For example, HPLC water is typically used for LCS water analyses. The purpose of an LCS is to help assess the overall accuracy and precision of the analytical process including sample preparation, instrument performance and analyst performance. LCS data must be reviewed in context with other controls to determine if out-of-control events occur.

## **Laboratory Replicates/Duplicates**

Laboratories often utilize MS/MSDs, LCS/LCSDs and/or replicates to assess precision. Replicates are a second analysis of a field-collected environmental sample. Replicates can be split at varying stages of the sample preparation and analysis process, but most commonly occur as a second analysis on the extracted media.

## **Surrogate Spikes**

The purposes of using a surrogate are to verify the accuracy of the instrument being used and extraction procedures. Surrogates are substances similar to, but not one of, the target analytes. A known concentration of surrogate is added to the sample and passed through the instrument, noting the surrogate recovery. Each surrogate used has an acceptable range of percent recovery. If a surrogate recovery is low, sample results may be biased low and depending on the recovery value, a possibility of false negatives may exist. Conversely, when recoveries are above the specified range of acceptance a possibility of false positives exist, although non-detected results are considered accurate.



## **DATA REDUCTION AND ASSESSMENT PROCEDURES**

### **Data Reduction**

Data reduction involves the conversion or transcription of field and analytical data to a useable format. The laboratory personnel will reduce the analytical data for review by the QA Leader and PM.

### **Field Measurement Evaluation**

Field data will be reviewed at the end of each day by following the QC checks outlined below and procedures in the Work Plan. Field data documentation will be checked against the applicable criteria as follows:

- Sample collection information.
- Field instrumentation and calibration.
- Sample collection protocol.
- Sample containers, preservation and volume.
- Field QC samples collected at the frequency specified.
- Sample documentation and COC protocols.
- Sample shipment.

Cooler receipt forms and sample condition forms provided by the laboratory will be reviewed for out-of-control incidents. The final report will contain what effects, if any, an incident has on data quality. Sample collection information will be reviewed for correctness before inclusion in a final report.

### **Field QC Evaluation**

A field QC evaluation will be conducted by reviewing field log books and daily reports, discussing field activities with staff and reviewing field QC samples (trip blanks and field duplicates). Trip blanks will be evaluated using the same criteria as method blanks.

Precision for field duplicate soil will not be evaluated because even a well-mixed sample is not entirely homogenous due to sampling procedures, soil conditions and contaminant transport mechanisms. Grab groundwater duplicate samples are also highly variable because of sampling procedures and borehole conditions and are therefore not reliable measures of precision.

### **Laboratory Data QC Evaluation**

The laboratory data assessment will consist of a formal review of the following QC parameters:

- Holding times
- Method blanks
- MS/MSD
- LCS/LCSD
- Surrogate spikes
- Replicates

In addition to these QC mechanisms, other documentation such as cooler receipt forms and case narratives will be reviewed to fully evaluate laboratory QA/QC.

## REFERENCES

- U.S. Environmental Protection Agency). 2001. EPA Requirements for Quality Assurance Project Plans. EPA QA/R-5. EPA/240/B-01/003. Office of Environmental Information, Washington, D.C. March 2001.
- U.S. Environmental Protection Agency). 2002. Guidance for Quality Assurance Project Plans. EPA QA/G-5. EPA/240/R-02/009. Office of Environmental Information, Washington, D.C. December 2002.
- U.S. Environmental Protection Agency. 2017a. National Functional Guidelines for Inorganic Superfund Methods Data Review. 540-R-2017-001. Office of Superfund Remediation and Technology Innovation. Washington, D.C. January 2017.
- U.S. Environmental Protection Agency. 2017b. National Functional Guidelines for Organic Superfund Methods Data Review. Office of Superfund Remediation and Technology Innovation. Washington, D.C. 540-R-2017-002. January 2017.
- Washington State Department of Ecology. 2016. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. Publication No. 04-03-030. July 2004 (revised December 2016).

**Table B-1**  
**Soil Measurement Quality Objective and Target Reporting Limits**  
 Cle Elum City  
 Cle Elum, Washington

Analyte	Method	MDL (mg/kg)	PQL (mg/kg)	LCS/LCSD			MS/MSD			MTCA Cleanup Level (mg/kg)
				Lower	Upper	RPD	Lower	Upper	RPD	
<b>VOCs (BTEX)</b>										
Benzene	EPA 8260D	0.0100	0.02	76	129	25	76	129	25	0.03
Ethylbenzene	EPA 8260D	0.0162	0.1	77	126	25	77	126	25	6
Toluene	EPA 8260D	0.0133	0.1	77	131	25	77	131	25	7
m, p-Xylene	EPA 8260D	0.0287	0.4	78	130	23	78	130	23	--
o-Xylene	EPA 8260D	0.0230	0.2	77	129	25	77	129	25	--
Xylene (Total)	Derived as sum of m, o, and p isomers									9
<b>TPH</b>										
Gasoline Range Organics	NWTPH-Gx	1.80	5	74	124	20	50	133	20	30/100 <sup>1</sup>
Diesel Range Organics	NWTPH-Dx	4.19	10	50	150	25	70.1	139	25	2,000
Heavy Oil Range Organics	NWTPH-Dx	5	25	50	150	25	50	150	25	2,000

**Notes:**

<sup>1</sup>MTCA Method A cleanup level for gasoline-range petroleum hydrocarbons is 100 mg/kg if benzene is not detected and the total concentrations of ethylbenzene, toluene and xylenes are less than 1 percent of the gasoline mixture; otherwise, the cleanup level is 30 mg/kg. Practical quantitation limits (PQLs) based on information provided by Eurofins TestAmerica Laboratories.

mg/kg = milligrams per kilogram; -- = Not established;

MDL = method detection limit; LCS = laboratory control spike; LCSD = laboratory control spike duplicate; MS = matrix spike; MSD = matrix spike duplicate; RPD = relative percent difference;

EPA = Environmental Protection Agency; VOCs = volatile organic compounds; TPH = total petroleum hydrocarbons; MTCA = Model Toxics Control Act

BTEX = benzene, toluene, ethylbenzene and xylenes

**Table B-2**  
**Groundwater Measurement Quality Objective and Target Reporting Limits**  
 Cle Elum City  
 Cle Elum, Washington

Analyte	Method	MDL (µg/L)	PQL (µg/L)	LCS/LCSD			MS/MSD			DUP	MTCA Cleanup Level (µg/L)
				Lower	Upper	RPD	Lower	Upper	RPD	RPD	
<b>VOCs (BTEX)</b>											
Benzene	EPA 8260D	0.093	0.4	80	126	18	80	126	18	--	5
Ethylbenzene	EPA 8260D	0.198	1	80	128	18	80	128	18	--	700
Toluene	EPA 8260D	0.312	1	80	129	18	80	129	18	--	1,000
m-Xylene (coelute) p-Xylene	EPA 8260D	0.280	2	80	127	18	80	127	18	--	--
o-Xylene	EPA 8260D	0.162	1	80	126	17	80	126	17	--	--
Xylene (Total)	EPA 8260D	Derived as sum of m, o and p isomers									1,000
<b>TPH</b>											
Gasoline Range Organics	NWTPH-Gx	70.4	150	80	120	20	56	126	20	35	1,000/800 <sup>1</sup>
Diesel Range Organics	NWTPH-Dx	240	110	50	150	25	54.5	136	32.5	25	500
Heavy Oil Range Organics	NWTPH-Dx	300	120	50	150	25	50	150	25	25	500

**Notes:**

<sup>1</sup>MTCA Method A cleanup level for gasoline-range petroleum hydrocarbons is 1,000 µg/L if benzene is not detected and the total concentrations of ethylbenzene, toluene and xylenes are less than 1 percent of the gasoline mixture; otherwise the cleanup level is 800 µg/L.

Practical quantitation limits (PQLs) based on information provided by Eurofins TestAmerica Laboratories.

µg/L = micrograms per liter; -- = Not established; DUP = duplicate; MCL = maximum contaminant level

MDL = method detection limit; LCS = laboratory control spike; LCSD = laboratory control spike duplicate; MS = matrix spike; MSD = matrix spike duplicate; RPD = relative percent diff

EPA = Environmental Protection Agency; VOCs = volatile organic compounds; TPH = total petroleum hydrocarbons; BTEX = benzene, toluene, ethylbenzene and xylenes

**Table B-3**  
**Soil Test Methods, Sample Containers, Preservation and Holding Time<sup>1</sup>**  
 Cle Elum City  
 Cle Elum, Washington

Analysis	Matrix	Method	Minimum Sample Size	Sample Containers	Sample Preservation	Holding Times
VOCs (BTEX)	Soil	EPA 8260D	30 g	2 pre-weighed 40 mL VOA vials preserved with MeOH; 4 oz jar (for dry-weight correction)	MeOH; <Cool 6 °C	14 days from collection to analysis
GRPH	Soil	NWTPH-Gx	30 g	2 pre-weighed 40 mL VOA vials preserved with MeOH; 4 oz jar (for dry-weight correction)	MeOH; Cool <6 °C	14 days from collection to analysis
DRPH/ORPH	Soil	NWTPH-Dx	30 g	4 or 8 oz glass wide-mouth with Teflon™-lined lid	Cool <6 °C	14 days from collection to extraction and 40 days from extraction to analysis

**Notes:**

<sup>1</sup>Holding times are based on elapsed time from date of collection.

VOCs = volatile organic compounds; MeOH = Methanol; VOA = volatile organic analysis

g = gram; mL = milliliters; C = Celsius

GRPH = gasoline-range petroleum hydrocarbons; DRPH = diesel-range petroleum hydrocarbons; ORPH = oil-range petroleum hydrocarbons

EPA = Environmental Protection Agency; BTEX = benzene, toluene, ethylbenzene and xylenes

**Table B-4**  
**Water Test Methods, Sample Containers, Preservation and Holding Time<sup>1</sup>**  
 Cle Elum City  
 Cle Elum, Washington

Analysis	Matrix	Method	Minimum Sample Size	Sample Containers	Sample Preservation	Holding Times
VOCs (BTEX)	Water	EPA 8260D	120ml	3 - 40 mL VOA	HCL pH<2, Cool <6°C	14 days from collection to analysis
GRPH	Water	NWTPH-Gx	80ml	3 - 40 mL VOA	HCL pH<2, Cool <6°C	14 days from collection to analysis
DRPH/ORPH	Water	NWTPH-Dx	250 ml	1 - 250 mL amber glass with Teflon™- lined cap	HCL pH<2; Cool <6°C	14 days from collection to extraction and 40 days from extraction to analysis

**Notes:**

<sup>1</sup>Holding times are based on elapsed time from date of collection.

VOC = volatile organic compound; VOA = volatile organic analysis; HCL = hydrochloric acid;

g = gram; mL = milliliters; C = Celsius

BTEX = benzene, toluene, ethylbenzene and xylenes;

**Table B-5**  
**Quality Control Samples Type and Frequency**  
 Cle Elum City  
 Cle Elum, Washington

Parameter	Field QC		Laboratory QC			
	Field Duplicate	Trip Blanks	Method Blanks	LCS	MS / MSD	Lab Duplicates
VOCs (BTEX)	1 per groundwater event	1 per soil event and 1 per water event	1/batch	1/batch	1/batch	1/batch
GRPH	1 per groundwater event	1 per soil event and 1 per water event	1/batch	1/batch	1/batch	1/batch
DRPH/ORPH	1 per groundwater event	None	1/batch	1/batch	1/batch	1/batch

**Notes:**

No more than 20 field samples can be contained in one batch.

VOCs = volatile organic compounds

GRPH = gasoline-range petroleum hydrocarbons; DRPH = diesel-range petroleum hydrocarbons; ORPH = oil-range petroleum hydrocarbons

LCS = Laboratory control sample; MS = Matrix spike sample; MSD = Matrix spike duplicate sample; BTEX = benzene, toluene, ethylbenzene and xylenes

**APPENDIX C**  
**Health and Safety Plan**



**APPENDIX C  
 SITE HEALTH AND SAFETY PLAN  
 CLE ELUM CITY SITE ASSESSMENT  
 CENTRAL REGION  
 MASTER CONTRACT C1900044. GEI037**

**GENERAL PROJECT INFORMATION**

**This Health and Safety Plan (HASP) is to be used in conjunction with the GeoEngineers Safety Program Manual.** Together, the written safety programs and this HASP constitute the site safety plan for this site. This plan is to be used by GeoEngineers personnel on this site and must be available on site. If the work entails potential exposures to other substances or unusual situations, additional safety and health information will be included, and the plan will be approved by the GeoEngineers Health and Safety Manager. All plans are to be used in conjunction with current standards and policies outlined in the GeoEngineers Health and Safety Program Manual.

**TABLE C-1. GENERAL PROJECT INFORMATION**

<b>Project Name:</b>	<b>Cle Elum City, Cle Elum, Washington</b>
Project Number:	0504-177-00
Type of Project:	Direct-Push Site Assessment
Project Address:	301 West 1 <sup>st</sup> Street, Cle Elum, Washington
Start/Completion:	April 2021/December 2021
Subcontractors:	Cascade Drilling – direct-push drilling Eurofins TestAmerica, Inc.(Eurofins TA) – laboratory analyses TBD – IDW disposal Utilities Plus, Inc. – private utility locating

*Liability Clause - This Site Safety Plan is intended for use by GeoEngineers Employees only. It does not extend to the other contractors or subcontractors working on this site. If requested by subcontractors, this site safety plan may be used as a minimum guideline for those entities to develop safety plans or procedures for their own staff to work under. In this case, Form 3 shall be signed by the subcontractor.*

All personnel participating in this project must receive initial health and safety orientation (Form 1). Thereafter, brief tailgate safety meetings will be held as deemed necessary by the Site Safety and Health Supervisor.

The orientation and the tailgate safety meetings shall include a discussion of emergency response, site communications and site hazards.

**TABLE C-2. ORGANIZATION CHART**

Chain of Command	Title	Name	Telephone Numbers
1	Principal-in-Charge	Bruce Williams	O: 509.363.2814 C: 509.954.6614
2	Project Manager	Jedidiah R. Sugalski	O: 509.209.2830 C: 509.991.4471
3	Site Safety and Health Officer (SSO); will vary by site	Bryce Hanson	O: 509.209.2818 C: 360.269.3237
		Joshua Lee	O: 509.209.2832 C: 406.239.7810
		Justin Orr	O: 509.209.3125 C: 406.890.1310
4	Health and Safety Program Manager (HSM)	Mary Lou Sullivan	O: 253.722.2425 C: 360.633.9821
5	Field Engineer/Geologist; will vary by site	Bryce Hanson/Joshua Lee/ /Justin Orr	See SSO contact info above
6	Subcontractor(s)	Cascade Drilling Utilities Plus, LLC (utility locate) Eurofins TA (chemical analysis) TBD (IDW)	O: 509.534.2740 O: 509.945.9840 O: 509.924.9200 TBD
7	Current Owner (c/o Ecology Project Manager)	Jill Scheffer	O: 509.454.7834 C: 509.571-4162

**Functional Responsibility**

**Project Manager (PM), Jedidiah R. Sugalski**

A PM is assigned to manage the activities of various projects and is responsible to the principal-in-charge of the project. The PM is responsible for assessing the hazards present at a job site and incorporating the appropriate safety measures for field staff protection into the field briefing and/or Site Safety Plan. He or she is also responsible for assuring that appropriate HASPs complying with this manual are developed. The PM will provide a summary of chemical analysis to personnel completing the HASP. PMs shall also see that their project budgets consider health and safety costs. The PM shall keep the HSM informed of the project’s health- and safety-related matters as necessary. The PM shall designate the project Site Safety Officer (SSO) and help the SSO implement the specifications of the HASP. The PM is responsible for communicating information in site safety plans and checklists to appropriate field personnel. Additionally, the PM and SSO shall hold a site safety briefing before any field activities begin. The PM is responsible for transmitting health and safety information to the Site Safety Officer (SSO) when appropriate.

**Site Safety and Health Supervisor**

The SSO will have the on-site responsibility and authority to modify and stop work, or remove personnel from the site if working conditions change that may affect on-site and off-site health and safety. The SSO will be the main contact for any on-site emergency situation. The SSO is First Aid and CPR qualified and has

current Hazardous Waste Operations and Emergency Response (HAZWOPER) training. The SSO is responsible for implementing and enforcing the project safety program and safe work practices during site activities. The SSO shall conduct daily safety meetings, perform air monitoring as required, conduct site safety inspections as required, coordinate emergency medical care, and ensure personnel are wearing the appropriate personal protective equipment (PPE). The SSO shall have advanced fieldwork experience and shall be familiar with health and safety requirements specific to the project. The SSO has the authority to suspend site activities if unsafe conditions are reported or observed.

Duties of the SSO include the following:

- Implementing the HASP in the field and monitoring compliance with its guidelines by staff.
- Being sure that all GeoEngineers field personnel have met the training and medical examination requirements. Advising other contractor employees of these requirements.
- Maintaining adequate and functioning safety supplies and equipment at the site.
- Setting up work zones, markers, signs and security systems, if necessary.
- Performing or supervising air quality measurements. Communicating information on these measurements to GeoEngineers field staff and subcontractor personnel.
- Communicating health and safety requirements and site hazards to field personnel, subcontractors and contractor employees, and site visitors.
- Directing personnel to wear PPE and guiding compliance with all health and safety practices in the field.
- Consulting with the PM regarding new or unanticipated site conditions, including emergency response activities. If monitoring detects concentrations of potentially hazardous substances at or above the established exposure limits, notify/consult with the PM. Consult with the PM and the HSM regarding new or unanticipated site conditions, including emergency response activities. If field monitoring indicates concentrations of potentially hazardous substances at or above the established exposure limits, the HSM must be notified and corrective action taken.
- Documenting all site accidents, illnesses and unsafe activities or conditions, and reporting them to the PM and the HSM.
- Directing decontamination operations of equipment and personnel.

### **Field Employees**

All employees working on site that have the potential of coming in contact with hazardous substances or physical hazards are responsible for participating in the health and safety program and complying with the site-specific health and safety plans. These employees are required to:

- Participate and be familiar with the health and safety program as described in this manual.
- Notify the SSO that when there is need to stop work to address an unsafe situation.
- Comply with the HASP and acknowledge understanding of the plan.
- Report to the SSO, PM or HSM any unsafe conditions and all facts pertaining to incidents or accidents that could result in physical injury or exposure to hazardous materials.

- Participate in health and safety training, including initial 40-hour Occupational Safety and Health Administration (OSHA) course, annual 8-hour HAZWOPER refresher, and First Aid/cardiopulmonary resuscitation (CPR) training.
- Participate in the medical surveillance program if applicable.
- Schedule and take a respirator fit test annually.
- Any field employee working on site may stop work if the employee believes the work is unsafe.

#### Contractors under GeoEngineers Supervision

Contractors working on the site under GeoEngineers supervision or direct control that have the potential of coming in contact with hazardous substances or physical hazards shall have their own health and safety program that is in line with the site-specific health and safety plan.

#### Health and Safety Manager, Mary Lou Sullivan

GeoEngineers' Health and Safety Program Manager (HSM) is responsible for implementing and promoting employee participation in the program. The HSM issues directives, advisories and information regarding health and safety to the technical staff. Additionally, the HSM has the authority to audit on-site compliance with HASPs, suspend work or modify work practices for safety reasons, and dismiss from the site any GeoEngineers or subcontractor employees whose conduct on the site endangers the health and safety of themselves or others.

**TABLE C-3. PERSONNEL TRAINING RECORDS**

Name of Employee On-Site	Level of HAZWOPER Training (24-/40-hour)	Date of 40-Hour/8-Hour Refresher Training	First Aid/ Cardiopulmonary Resuscitation (CPR)
Joshua Lee	40-hr (Supervisor)	1/22/2021	1/28/2020
Bryce Hanson	40-hr	3/31/2021	2/3/2021
Justin Orr	40-hr	1/13/2021	11/12/2020

#### SITE DESCRIPTION, MAP AND FIELD ACTIVITIES

The project description and a map of the site layout are provided as part of the work plan on Figures 1 and 2. Work zones will be established around the drill rig, backhoe, excavator, borings and monitoring wells, if applicable, at each site. In general, work zones will be within a 10-foot radius of an investigation activity.

**TABLE C-4. LIST OF FIELD ACTIVITIES**


Check the Activities to be Completed during the Project	
X	Site reconnaissance
X	Direct-push exploration
	Test pit exploration
	SVE system operation
X	Soil sample collection
X	Groundwater sampling

Check the Activities to be Completed during the Project	
X	Field screening of contaminated media
	Soil vapor measurements
X	Groundwater depth and free product measurement (if any)
	Soil stockpile testing
	Remedial excavation
	Monitoring well installation
	Monitoring well development

## EMERGENCY INFORMATION

In the case on an emergency requiring medical treatment, the location of the nearest hospital and route is provided in Table C-5. Other emergency procedures are described in the following section.

**TABLE C-5. EMERGENCY INFORMATION**

<b>Hospital Name and Address:</b>	<b>KVH Urgent Care – Cle Elum</b> 214 W 1 <sup>st</sup> Street Cle Elum, Washington	
<b>Phone Numbers (Hospital ER):</b>	509.674.6944 or 911	
<b>Distance:</b>	220 feet	
<b>Route to Hospital:</b>		
1. Head north on Billings Avenue. Hospital is across the street from the site.		
<b>Ambulance:</b>		911
<b>Poison Control:</b>		800.222.1222
<b>Police:</b>		911
<b>Fire:</b>	911	

<b>Location of Nearest Telephone:</b>	Cell phones are carried by field personnel.
<b>Nearest Fire Extinguisher:</b>	Located in the GeoEngineers' vehicle on site.
<b>Nearest First-Aid Kit:</b>	Located in the GeoEngineers' vehicle on site.

## Standard Emergency Procedures

1. Get help
  - a. Send another worker to phone 911 (if necessary)
  - b. As soon as feasible, notify GeoEngineers' project manager
2. Reduce risk to injured person
  - c. Turn off equipment
  - d. Move person from injury location (if possible)
  - e. Keep person warm
  - f. Perform CPR (if necessary)
3. Transport injured person to medical treatment facility (if necessary)
  - g. By ambulance (if necessary) or GeoEngineers vehicle
  - h. Stay with person at medical facility
  - i. Keep GeoEngineers manager apprised of situation and notify human resources manager of situation

## HAZARD ANALYSIS

A hazard analysis has been completed as part of preparation of this HASP. The hazard analysis was performed taking into account the known and potential hazards at the site and surrounding areas, as well as the planned work activities. The results of the hazard analysis are presented in this section. The hazard assessment will be evaluated each day before beginning work. Updates will be made as necessary and documented in the Job Hazard Analyses (JHA) Form 3 or daily field log.

### Physical Hazards

The following are known applicable physical hazards.

**TABLE C-6. PHYSICAL HAZARDS**

X	Drill rigs and concrete coring
	Backhoes
X	Overhead hazards/powerlines
X	Tripping/puncture hazards (debris on site, steep slopes or pits)
X	Snow, rain, ice, freezing temperatures
X	Heat/Cold, Humidity

X	Utilities/utility locate
X	Contaminated soil
X	Contaminated groundwater
X	Unusual traffic hazard – Street traffic
X	Loud noise
	Excavators
	Front End Loader/Forklifts
X	Excavations/trenching (1:1.5 slopes for Type C soil if entering the excavation)
	Shored/braced excavation if greater than 4 feet of depth

- Utility checklist will be completed as required for the location to prevent drilling or digging into utilities. Note: These procedures should be added to the standard GeoEngineers utility checklist.
- Lifting hazards: use proper techniques, mechanical devices where appropriate.
- Terrain obstacles: terrain could be soft, and activities will be conducted to minimize lawn damage and the potential for vehicles to get stuck.
- Personnel will wear high-visibility vests for increased visibility by vehicle and equipment operators.
- Field personnel will be aware at all times of the location and motion of heavy equipment in the area of work to ensure a safe distance between personnel and the equipment. Personnel will be visible to the operator at all times and will remain out of the swing and/or direction of the equipment apparatus. Personnel will approach operating heavy equipment only when they are certain the operator has indicated that it is safe to do so through hand signal or other acceptable means.
- Heavy equipment and/or vehicles are not anticipated.
- Heavy equipment and/or vehicles used on this site will not work within 20 feet of overhead utility lines without first ensuring that the lines are not energized. This distance may be reduced to 10 feet, depending on the client and the use of a safety watch. Note: If it is later determined that overhead lines are a hazard on this job site, a copy the overhead lines safety section from the HASP Supplemental document shall be attached.
- Don't operate equipment around overhead power lines unless you are authorized and trained to do so. If an object (scaffolds, crane, etc.) must be moved in the area of overhead power lines, appoint a competent worker whose sole responsibility is to observe the clearance between the power lines and the object. Warn others if the minimum distance is not maintained.
- Never touch an overhead line if it has been brought down by machinery or has fallen. Never assume lines are dead. When a machine is in contact with an overhead line, DO NOT allow anyone to come near or touch the machine. Stay away from the machine and summon outside assistance. Never touch a person who is in contact with a live power line.
- If you are in a vehicle that is in contact with an overhead power line, DON'T LEAVE THE VEHICLE. As long as you stay inside and avoid touching metal on the vehicle, you may avoid an electrical hazard. If you need to get out to summon help or because of fire, jump out without touching any wires or the machine, keep your feet together, and hop to safety.

- Personnel will avoid tripping hazards, steep slopes, pit and other hazardous encumbrances. If it becomes necessary to work within 6 feet of the edge of a pit, slope, pier or other potentially hazardous area, appropriate fall protection measures will be implemented by the Site Safety and Health Supervisor in accordance with Occupational Safety and Health Administration (OSHA)/Division of Occupational Safety and Health (DOSH) regulations and the GeoEngineers Safety Program manual.
- Excessive levels of noise (exceeding 85 decibels [dBA]) are anticipated. Personnel potentially exposed will wear ear plugs or muffs with a noise reduction rating of at least 25 dBA whenever it becomes difficult to carry on a conversation 6 feet away from a co-worker or whenever noise levels become bothersome. (Increasing the distance from the source will decrease the noise level noticeably.)
- Cold stress control measures will be implemented according to the GeoEngineers Health and Safety Program to prevent frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature). Heated break areas and warm beverages shall be available during periods of cold weather.
- Heat stress control measures required for this site will be implemented according to GeoEngineers Health and Safety Program with water provided on site.

**TABLE C-7. ENGINEERING CONTROLS**

	Trench shoring (1:1 slope for Type B Soils)
	Locate work spaces upwind/wind direction monitoring
	Other soil covers (as needed)
	Other (specify _____)

### Chemical Hazards

This section includes all chemical hazards that have been identified to date at the site.

**TABLE C-8 CHEMICALS POTENTIAL CHEMICAL HAZARDS AT THE SITE**

Compound/Description	OSHA PEL Exposure Limits	NIOSH/ACGIH TLV Exposure Limits/IDLH	Exposure Routes	Toxic Characteristics
Gasoline	300ppm (TWA) 500 ppm (STEL)	300-ppm 8-hour TWA and a 500-ppm 15-minute STEL	Ingestion, inhalation, skin absorption, skin and eye contact	Irritated eyes, skin, mucous membrane; fatigue; blurred vision; dizziness; slurred speech; confusion; convulsions; and headache; dermatitis.
Diesel fuel	None established by OSHA	ACGIH: 100 mg/m <sup>3</sup> (as total hydrocarbons)	Inhalation, absorption, skin and eye contact	Irritated eyes, skin, and mucous membrane; fatigue; blurred vision; dizziness; slurred speech; confusion; convulsions; and headache, and dermatitis



Compound/ Description	OSHA PEL Exposure Limits	NIOSH/ACGIH TLV Exposure Limits/IDLH	Exposure Routes	Toxic Characteristics
Benzene	1 ppm (TWA) 5 ppm (STEL)	NIOSH REL: 0.1 ppm (TWA) Ca 1 ppm (STEL) 500 ppm (IDLH) ACGIH TLV: 0.5 ppm (TWA) 2.5 ppm (STEL)	Inhalation, absorption	Irritation of eyes, skin, nose, respiratory system, dizziness, headache, nausea, staggered gait, anorexia, exhaustion, dermatitis, bone marrow depression (leukemia).
Toluene	200 ppm (TWA) 300 ppm (C)	ACGIH: 20 ppm (TWA); NIOSH: 100 ppm (REL) 500 ppm (IDLH)	Inhalation, absorption	Irritation to eyes, nose, exhaustion, confusion, dizziness, headaches, dilated pupils, euphoria, anxiety, teary eyes, muscle fatigue, insomnia, paresthesia, dermatitis, liver and kidney damage.
Ethylbenzene	100 ppm (TWA)	ACGIH: 20 ppm (TWA) NIOSH: 100 ppm (REL) 800 ppm (IDLH)	Inhalation, absorption	Irritation to eyes, skin, respiratory system, burning of skin, dermatitis.
Xylenes	100 ppm (TWA)	ACGIH: 100 ppm (TWA) 150 ppm (ST) NIOSH: 100 ppm (REL) 900 ppm (IDLH)	Inhalation, absorption	Irritation to eyes, skin, nose, throat, dizziness, excitement, drowsiness, incoordination, staggering gait, corneal vacuolization, anorexia, nausea, vomiting, abdominal pain, dermatitis.
Naphthalene	10 ppm (TWA)	ACGIH: 10 ppm (TWA) NIOSH: 10 ppm (REL) 250 ppm (IDLH)	Inhalation, absorption,	Upper respiratory tract irritation, cataracts, hemolytic anemia

Notes:

REL = NIOSH Recommended Exposure Limit.

NIOSH = National Institute for Occupational Safety and Health

STEL = short-term exposure limit

PEL = permissible exposure limit

C = Ceiling

ACGIH = American Conference of Governmental Industrial Hygienists

TLV-TWA = Threshold limit value- time weighted average for no more than 8 hours (ACGIH)

IDLH = Immediately dangerous to life or health if exposed for more than 30 minutes (NIOSH)

mg/m<sup>3</sup> = micrograms per cubic meter

ppm = parts per million

## Gasoline

Gasoline is a known animal carcinogen, but unknown relevance to humans. Benzene, a gasoline component is a known human carcinogen. Exposure can produce a wide range of health effects depending on the amount and timing of exposure. Exposure may irritate the eyes, skin, respiratory tract and may also affect the central nervous system.

## Diesel Fuel

Diesel fuels are similar to fuel oils used for heating (fuel oils no. 1, no. 2 and no. 4). All fuel oils consist of complex mixtures of aliphatic and aromatic hydrocarbons. Diesel fuels predominantly contain a mixture of C10 through C19 hydrocarbons, which include approximately 64 percent aliphatic hydrocarbons, 1 to 2 percent olefinic hydrocarbons, and 35 percent aromatic hydrocarbons. Workers may be exposed to fuel oils through their skin without adequate protection, such as gloves, boots, coveralls or other protective clothing. Breathing diesel fuel vapors for a long time may damage your kidneys, increase your blood pressure, or lower your blood's ability to clot. Constant skin contact (for example, washing) with diesel fuel may also damage your kidneys. The International Agency for Research on Cancer (IARC) has determined that residual (heavy) fuel oils and marine diesel fuel are possibly carcinogenic to humans (Group 2B classification).

Residue from aged diesel fuel can irritate the skin, if left in contact for too long. Degraded fuel can irritate the skin and mucous membranes, if contact is made. Exercising good personal hygiene and cleaning off PPE post-work and prior to re-donning safety equipment will minimize potential contact. More on Total Petroleum Hydrocarbons health effects in the Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profile document here: <https://www.atsdr.cdc.gov/ToxProfiles/TP.asp?id=424&tid=75>

## Benzene

Benzene is a central nervous system depressant. Symptoms include headache, nausea, tremors and fatigue, but these typically do not occur until exposure concentrations are in excess of 150 ppm. There is significant evidence that chronic exposures are carcinogenic causing a progressively malignant disease of the blood-forming organs. Contact with liquid benzene may cause blistering and dermatitis. In addition, benzene can be absorbed through unprotected skin and eye and mucous membranes. Benzene vapors can cause transient eye irritation. The mean air odor threshold for benzene is 34 ppm. Benzene's ionization potential (IP) is 9.25 eV, and its vapor pressure is 75 mm Hg. Benzene has an ACGIH A1 designation, a Confirmed Human Carcinogen (leukemia). It also has a skin notation, indicating the potentially significant contribution to the overall exposure by the cutaneous route; including mucous membranes and the eyes, by contact with vapors, liquids and solids.

## Ethylbenzene

Ethylbenzene is a highly flammable, colorless liquid and VOC with an odor similar to that of gasoline. It is commonly used in the production of polystyrene, a highly used plastic material. Exposure primarily comes through off-gas vapor. Low amounts of ethylbenzene exposure are not considered immediately harmful, however longer-term toxicity and carcinogenicity is still under study. Common symptoms of exposure include eye and mucous membrane irritation, respiratory irritation, and dermatitis. OSHA, ACGIH and NIOSH currently have a PEL of 100 ppm for ethylbenzene. Ethylbenzene is considered an ACGIH A3 carcinogen, which is a confirmed animal carcinogen.

### Toluene

Toluene is a colorless, water-insoluble liquid and VOC used commonly in paint thinners, contact cement and some glues. Toluene residue can off-gas, and inhalation of low to moderate levels of toluene can cause confusion, tiredness, weakness, memory loss, and other harmful effects. The odor of toluene gas is similar to that of paint thinner. OSHA has prescribed a PEL of 200 ppm while ACGIH has a lower PEL of 20 ppm. While ACGIH considers toluene an A4 carcinogen, Not Classified as a Human Carcinogen, the chemical's known adverse effect on hearing is currently being investigated further.

### Xylene

Xylene is a colorless, flammable liquid and VOC commonly used in the petrochemical industry as well as being used in commercial gasoline and aircraft fuels. It has a sweet odor. Xylene exposure can irritate the eyes, nose, skin, and throat as well as cause headaches, dizziness, and confusion. Both OSHA and WA-DOSH prescribe a PEL of 100 ppm for xylene. It is an ACGIH A4 carcinogen; Not Classified as a Human Carcinogen.

### Naphthalene

Naphthalene is a colorless to brown solid VOC with a distinctive smell of mothballs, one of its primary uses. Naphthalene is also used as a household fumigant, and precursor chemical to many other industrial substances. Naphthalene exposure has numerous negative health effects associated with its exposure. Including fatigue, lack of appetite, confusion, nausea, vomiting, diarrhea, blood in the urine, and jaundice. OSHA and NIOSH have regulated a PEL of 10 ppm. Naphthalene is considered an ACGIH A3 carcinogen, which is a confirmed animal carcinogen.

### Biological Hazards

Site personnel shall avoid contact with or exposures to potential biological hazards encountered.

**TABLE C-9. BIOLOGICAL HAZARDS AND PROCEDURES**

Y/N	Hazard	Procedures
N	Poison Ivy or other vegetation	Avoid contact
N	Insects or snakes	Avoid contact
X	COVID-19	Refer to COVID-specific JHA

Site personnel shall avoid contact with or exposures to potential biological hazards encountered. Follow JHA specific to COVID-19 required protocols.

### Additional Hazards (Update in Daily Log)

Include evaluation of:

- Physical Hazards (equipment, traffic, tripping, heat stress, cold stress and others)
- Chemical Hazards (odors, spills, free product, airborne particulates and others present)
- Biological Hazards (COVID-19, snakes, spiders, other animals, poison ivy and others present)

## AIR MONITORING PLAN

An air monitoring plan has been prepared as part of development of this HASP. The air monitoring plan is based on the results of the chemical exposure assessment and the known and potential inhalation hazards on site. The air monitoring plan addresses steps necessary to limit worker exposure. Non-occupational exposures are not addressed in this plan.

Work upwind if at all possible.

### Check Instrumentation to be Used

- Multi-Gas Detector (may include oxygen, carbon monoxide, hydrogen sulfide, lower explosive limit)
- Dust Monitor
- Other (i.e., detector tubes or badges) Please specify: PID

### Check Monitoring Frequency/Locations and Type (Specify: Work Space, Borehole, Breathing Zone):

- Continuous during soil disturbance activities or handling samples (work space)
- 15 minutes
- 30 minutes
- Hourly (breathing zone)

## Additional Personal Air Monitoring for Specific Chemical Exposure

### Action Levels for Volatile Organic Chemicals

- The workspace will be monitored using a photoionization detector (PID). These instruments must be properly maintained, calibrated and charged (refer to the instrument manuals for details). Zero this meter in the same relative humidity as the area in which it will be used and allow at least a 10-minute warm-up prior to zeroing. Do not zero in a contaminated area.
- An initial vapor measurement survey of the site should be conducted to detect “hot spots” if contaminated soil is exposed at the surface. Vapor measurement surveys of the workspace should be conducted at least hourly or more often if persistent petroleum-related odors are detected. Additionally, if vapor concentrations exceed 5 parts per million (ppm) above background continuously for a 5-minute period as measured in the breathing zone, upgrade to Level C PPE or move to a non-contaminated area.
- Standard industrial hygiene/safety procedure is to require that action be taken to reduce worker exposure to organic vapors when vapor concentrations exceed one-half the threshold limit value (TLV). Because of the variety of chemicals, the PID will not indicate exposure to a specific PEL.

**TABLE C-10. AIR MONITORING ACTION LEVELS**

Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Organic Vapors	Drilling and sampling	PID	Start of shift; every 60 minutes and in event of odors	Background to 5 ppm in breathing zone	Use Level D or Modified Level D PPE
Organic Vapors	Drilling and sampling	PID	Start of shift; every 60 minutes and in event of odors	5 to 50 ppm in breathing zone	Upgrade to Level C PPE
Organic Vapors	Drilling and sampling	PID	Start of shift; every 60 minutes and in event of odors	> 50 ppm in breathing zone	Stop work and evacuate the area. Contact Health and Safety Program Manager for guidance.
Combustible Atmosphere	Drilling and sampling	PID	Start of shift; every 60 minutes and in event of odors	>1,000 ppm	Stop work and evacuate the site. Contact Health and Safety Program Manager for guidance.

**SITE CONTROL PLAN**

Work zones will be considered to be within 50 feet of the drill rig, backhoe, or other equipment. Employees should work upwind of the machinery if possible. To the extent practicable, use the buddy system. Do not approach heavy equipment unless you are sure the operator sees you and has indicated it is safe to approach. All personnel from GeoEngineers and subcontractor(s) should be made aware of safety features during each morning’s safety tailgate meeting (drill rig shutoff switch, location of fire extinguishers, cell phone numbers, etc.). For medical assistance, see Emergency Information section above.

**Traffic or Vehicle Access Control Plans**

Survey tape and traffic cones will be used to cordon off any areas on site where borings will be conducted or monitoring wells will be developed and sampled in order to restrict public vehicular and pedestrian access. When working in city right-of-way on arterial roads, a traffic control plan is provided, and traffic control equipment shall be deployed in accordance with the plan.

**Site Work Zones**

An exclusion zone, contamination reduction zone and support zone should be established around working areas. Personnel leaving the facility or on break should exit the exclusion zone through the contamination reduction zone. The contamination reduction zone, at a minimum, should consist of garbage bags into which used PPE should be disposed. Personnel should wash hands at the Facility before eating or leaving the facility.

Hot zone/exclusion zone: *Within 10 feet of borings or excavations*

Method of Delineation / Excluding Non-Site Personnel	
	Fence
X	Traffic Cones
X	Other Road Work Signs

## Buddy System

Personnel on site should use the buddy system (pairs), particularly whenever communication is restricted. If only one GeoEngineers employee is on site, a buddy system can be arranged with subcontractor/contractor personnel.

## Site Communication Plan

Positive communications (within sight and hearing distance or via radio) should be maintained between pairs on site, with the pair remaining in proximity to assist each other in case of emergencies. The team should prearrange hand signals or other emergency signals for communication when voice communication becomes impaired (including cases of lack of radios or radio breakdown) and an agreed upon location for an emergency assembly area.

In instances where communication cannot be maintained, you should consider suspending work until it can be restored. If this is not an option, the following are some examples for communication:

- Hand gripping throat: Out of air, can't breathe.
- Gripping partner's wrist or placing both hands around waist: Leave area immediately, no debate.
- Hands on top of head: Need assistance.
- Thumbs up: Okay, I'm all right; or, I understand.
- Thumbs down: No, negative.

## Emergency Action

In the event of an emergency, employees will convene in a designated area identified on the Job Hazard Analyses Form (JHA) Form 3. Employees should communicate with others working on site and the PM to determine the Emergency Action Plan for each site. All personnel from GeoEngineers and subcontractor(s) should be made aware of the Emergency Action for the site at each morning's safety tailgate meeting (drill rig shutoff switch, location of fire extinguishers, cell phone numbers, etc.). For medical assistance, see Emergency Information section above.

## Decontamination Procedures

Decontamination, at a minimum, should include removing and disposing of PPE when exiting the exclusion zone; and washing your hands. Decontamination may also consist of removing outer protective gloves and washing soiled boots and gloves using bucket and brush provided on site in the contamination reduction zone. If needed, inner gloves will then be removed, and respirator, hands and face will be washed in either a portable wash station or a bathroom facility at the site. Employees will perform decontamination procedures and wash before eating, drinking or leaving the site.

## Waste Disposal or Storage

Used PPE is to be placed in a plastic bag and disposed of as municipal waste.

### Drill Cutting/Excavated Sediment Disposal or Storage:

- On site in WA Department of Transportation (DOT) approved steel drums, pending analysis and further action
- Secured (list method):
- Other (describe destination, responsible parties):

## PERSONAL PROTECTIVE EQUIPMENT

After the initial and/or daily hazard assessment has been completed the appropriate PPE will be selected to ensure worker safety. Task-specific levels of PPE shall be reviewed with field personnel during the pre-work briefing conducted before the start of site operations. Task-specific levels of PPE shall be reviewed with field personnel during the pre-work briefing conducted before the start of site operations.

Site activities include handling and sampling solid subsurface material (material may potentially be saturated with contaminated materials and groundwater). Depth-to-groundwater measurements will be performed as well. Site hazards include potential exposure to hazardous materials, and physical hazards such as trips/falls, heavy equipment, and contaminant exposure.

Air monitoring will be conducted to determine the level of respiratory protection.

- Level D PPE, unless a higher level of protection is required, will be worn at all times on the site. Potentially exposed personnel will wash gloves, hands, face and other pertinent items to prevent hand-to-mouth contact. This will be done prior to hand-to-mouth activities including eating, smoking, etc.
- Adequate personnel and equipment decontamination will be used to decrease potential ingestion and inhalation.

Check Applicable Personal Protection Equipment to be Used	
X	Hardhat
X	Steel-toed boots
X	Safety glasses
X	Hearing protection
X	Rubber boots (if wet conditions)
<b>Gloves (specify)</b>	
X	Nitrile
	Latex
	Liners
	Leather
	Other (specify) _____
<b>Protective clothing</b>	

Check Applicable Personal Protection Equipment to be Used	
	Tyvek (if dry conditions are encountered, Tyvek is sufficient)
	Saranex (personnel will use Saranex if liquids are handled, or splash may be an issue)
X	Cotton
X	Rain gear (as needed)
X	Layered warm clothing (as needed)
Inhalation hazard protection	
X	Level D
	Level C (respirators with organic vapor filters / P100 filters)

### Personal Protective Clothing Inspections

PPE clothing ensembles designated for use during site activities shall be selected to provide protection against known or anticipated hazards. However, no protective garment, glove or boot is entirely chemical-resistant, nor does any PPE provide protection against all types of hazards. To obtain optimum performance from PPE, site personnel shall be trained in the proper use and inspection of PPE. This training shall include the following:

- Inspect PPE before and during use for imperfect seams, non-uniform coatings, tears, poorly functioning closures or other defects. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Inspect PPE during use for visible signs of chemical permeation such as swelling, discoloration, stiffness, brittleness, cracks, tears or other signs of punctures. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Disposable PPE should not be reused after breaks unless it has been properly decontaminated.

### Respirator Selection, Use and Maintenance

If respirators are required, site personnel shall be trained before use on the proper use, maintenance and limitations of respirators. Additionally, they must be medically qualified to wear respiratory protection in accordance with 29 CFR 1910.134. Site personnel who will use a tight-fitting respirator must have passed a qualitative or quantitative fit test conducted in accordance with an OSHA-accepted fit test protocol. Fit testing must be repeated annually or whenever a new type of respirator is used. Respirators will be stored in a protective container.

### Respirator Cartridges

If the action levels identified in the Air Monitoring Action Levels Table in Table C-10, are exceeded, site personnel should don respiratory protection appropriate for the known or suspected chemical of concern. For the identified field activities, use of a respirator is not anticipated. If PID readings trigger the action levels in Table C-10, stop work and a respirator must be obtained from a GeoEngineers office if air concentration remains above the action levels. For most sites, a half-face or full-face air purifying respirator with a National Institute for Occupational Safety and Health (NIOSH)-approved organic vapor/HEPA P100 combination cartridge (Level C), will be appropriate for the known or suspected chemicals of concern. Monitoring frequency should be continuous while using Level C respiratory protection. The SSO closely



monitor personnel using respiratory protection, including observing for signs of fatigue or respiratory distress, the potential for cartridge breakthrough or increased resistance to inhalation, and the need for changes in the level of respiratory protection based on air monitoring. The frequency and duration of breaks should be increased for personnel working in respiratory protection. If at any time on-site air monitoring indicates Level B respiratory protection is warranted, personnel should leave the exclusion zone and consult with the HSM.

If site personnel are required to wear air-purifying respirators, the appropriate cartridges shall be selected to protect personnel from known or anticipated site contaminants. The respirator/cartridge combination shall be approved and NIOSH-certified. A cartridge change-out schedule shall be developed based on known site contaminants, anticipated contaminant concentrations and data supplied by the cartridge manufacturer related to the absorption capacity of the cartridge for specific contaminants. Site personnel shall be made aware of the cartridge change-out schedule prior to the initiation of site activities. Site personnel shall also be instructed to change respirator cartridges if they detect increased resistance during inhalation or detect vapor breakthrough by smell, taste or feel, although breakthrough is not an acceptable method of determining the change-out schedule.

### **Respirator Inspection and Cleaning**

The Site Safety Officer shall periodically (weekly) inspect respirators at the project site. Site personnel shall inspect respirators prior to each use in accordance with the manufacturer's instructions. In addition, site personnel wearing a tight-fitting respirator shall perform a positive and negative pressure user seal check each time the respirator is donned, to ensure proper fit and function. User seal checks shall be performed in accordance with the GeoEngineers respiratory protection program or the respirator manufacturer's instructions.

## **ADDITIONAL ELEMENTS**

### **Cold Stress Prevention**

Working in cold environments presents many hazards to site personnel and can result in frost nip (superficial freezing of the skin), frost bite (deep tissue freezing) or hypothermia (lowering of the core body temperature).

The combination of wind and cold temperatures increases the degree of cold stress experienced by site personnel. Site personnel shall be trained on the signs and symptoms of cold-related illnesses, how the human body adapts to cold environments and how to prevent the onset of cold-related illnesses. Heated break areas and warm beverages shall be provided during periods of cold weather.

### **Heat Stress Prevention**

Keep workers hydrated in a hot outdoor environment requires more water be provided than at other times of the year. When employee exposure is at or above an applicable temperature listed in the Heat Stress table below, Project Managers will ensure that:

- A sufficient quantity of drinking water is readily accessible to employees at all times.
- All employees have the opportunity to drink at least 1 quart of drinking water per hour.

## HEAT STRESS

Type of Clothing	Outdoor Temperature Action Levels
Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
All other clothing	89°

## Emergency Response

Indicate what site-specific procedures you will implement.

- Personnel on site should use the “buddy system” (pairs).
- Visual contact should be maintained between “pairs” on site, with the team remaining in proximity to assist each other in case of emergencies.
- If any member of the field crew experiences any adverse exposure symptoms while on site, the entire field crew should immediately halt work and act according to the instructions provided by the SSO.
- Wind indicators visible to all on-site personnel should be provided by the SSO to indicate possible routes for upwind escape. Alternatively, the SSO may ask on-site personnel to observe the wind direction periodically during site activities.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team, contact of the PM, and reevaluation of the hazard and the level of protection required.
- If an accident occurs, the Site Safety Officer and the injured person are to complete, within 24 hours, an Accident Report (Form 4) for submittal to the PM, the HSM and HR. The PM should ensure that follow-up action is taken to correct the situation that caused the accident or exposure.

## MISCELLANEOUS

### Personnel Medical Surveillance

GeoEngineers employees are not in a medical surveillance program because they do not fall into the category of “Employees Covered” in OSHA 1910.120(f)(2), which states that a medical surveillance program is required for the following employees:

1. All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.
6. All employees who wear a respirator for 30 days or more a year or as required by state and federal regulations.
7. All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

8. Members of HAZMAT teams.

### **Spill Containment Plans (Drum and Container Handling)**

Issues to be addressed in this section include:

- Site topography is generally flat.
- Site drainage –Municipal drain.
- There are no engineered site drains.

### **Sampling, Managing and Handling Drums and Containers**

Drums and containers used during the investigation shall meet the appropriate WA DOT, OSHA and U.S. Environmental Protection Agency (EPA) regulations for the waste that they contain. Site operations shall be organized to minimize the amount of drum or container movement. When practicable, drums and containers shall be inspected, and their integrity shall be ensured before they are moved. Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled. Before drums or containers are moved, all employees involved in the transfer operation shall be warned of the potential hazards associated with the contents.

Drums or containers and suitable quantities of proper absorbent shall be kept available and used where spills, leaks or rupturing may occur. Where major spills may occur, a spill containment program shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred. Fire extinguishing equipment shall be on hand and ready for use to control incipient fires.

### **Entry Procedures for Tanks or Vaults (Confined Spaces)**

GeoEngineers employees shall not enter confined spaces to perform work unless they have been properly trained and with hands-on experience in the use of retrieval equipment. If a project requires confined space entry, please include a copy of the confined space permit and include the training documentation in this HASP.

Trenches greater than 4 feet in depth with the potential for buildup of a hazardous atmosphere are considered confined spaces.

### **Sanitation**

Sanitary facilities are not available on site. The Golden Nugget convenience store is the closest bathroom. Soap and water shall be located in the GeoEngineers vehicle.

### **Lighting**

Work is anticipated to be performed during daylight hours. Work may extend slightly into the evening provided adequate lighting is used (e.g., portable flood lights).

## **DOCUMENTATION TO BE COMPLETED FOR HAZWOPER PROJECTS**

- Daily Field Log
- FORM 1—Health and Safety Pre-Entry Briefing and Acknowledgment of Site Health and Safety Plan for use by employees, subcontractors and visitors
- FORM 2—Safety Meeting Record
- FORM 3—Job Hazard Analyses (JHA) Form
- FORM 4—Accident/Exposure Report Form

NOTE: The Field Log is to contain the following information:

- Updates on hazard assessments, field decisions, conversations with subcontractors, client or other parties, etc.;
- Air monitoring/calibration results, including: personnel, locations monitored, activity at the time of monitoring, etc.;
- Actions taken;
- Action level for upgrading PPE and rationale; and
- Meteorological conditions (temperature, wind direction, wind speed, humidity, rain, snow, etc.).

## APPROVALS

1. Plan Prepared

Justin D. Orr 04/29/2021

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Signature Date

2. Plan Approval

Jedidiah R. Sugalski 04/29/2021

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PM Signature Date

3. Health & Safety Manager

Mary Lou Sullivan 4/29/2021

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HSM Signature Date

**FORM 1**  
**HEALTH AND SAFETY PRE-ENTRY BRIEFING AND ACKNOWLEDGEMENT OF THE SITE HEALTH AND SAFETY PLAN FOR GEOENGINEERS' EMPLOYEES, SUBCONTRACTORS AND VISITORS**  
**CLE ELUM CITY SITE ASSESSMENT**  
**FILE NO. 0504-177-00**

Inform employees, contractors and subcontractors or their representatives about:

- The nature, level and degree of exposure to hazardous substances they are likely to encounter;
- All site-related emergency response procedures; and
- Any identified potential fire, explosion, health, safety or other hazards.

Conduct briefings for employees, contractors and subcontractors, or their representatives as follows:

- A pre-entry briefing before any site activity is started.
- Additional briefings, as needed, to make sure that the Site-specific HASP is followed.
- Make sure all employees working on the Site are informed of any risks identified and trained on how to protect themselves and other workers against the Site hazards and risks.
- Update all information to reflect current sight activities and hazards.
- All personnel participating in this project must receive initial health and safety orientation. Thereafter, brief tailgate safety meetings will be held as deemed necessary by the Site Safety Officer.
- The orientation and the tailgate safety meetings shall include a discussion of emergency response, site communications and site hazards.

(All of GeoEngineers' Site workers shall complete this form, which should remain attached to the HASP and be filed with other project documentation). Please be advised that this site-specific HASP is intended for use by GeoEngineers employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this site to use or legally rely on this HASP. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by the company.

I hereby verify that a copy of the current HASP has been provided by GeoEngineers, Inc., for my review and personal use. I have read the document completely and acknowledge an understanding of the safety procedures and protocol for my responsibilities on site. I agree to comply with all required, specified safety regulations and procedures.

**Print Name**

**Signature**

**Date**

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**FORM 3**  
**JOB HAZARD ANALYSES (JHA) FORM**  
**CLE ELUM CITY SITE ASSESSMENT**  
**FILE NO. 0504-177-00**

This form can be used for analyses of daily hazards where there are multiple tasks and ongoing projects and for record keeping purposes. Make copies as needed.

<b>Project:</b> Site Investigation <b>File No:</b> 0504-177-00		<b>Date:</b> 4/16/2021	<b>Site Location:</b> First Street and Billings Avenue, Cle Elum, Washington		
<b>Development Team:</b>		<b>Position/Title:</b>		<b>Reviewed by:</b>	<b>Position/Title:</b>
JR Sugalski		Senior Environmental Engineer		Name	Position
Name		Position		Name	Position
<b>Minimum Required Protective Equipment:</b> (see critical actions for task-specific requirements)					
<b>PPE</b>	<b>Equipment</b>	<b>Tools</b>		<b>Actions</b>	
<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> High Visibility Vest <input checked="" type="checkbox"/> Safety Shoes/Waders <input checked="" type="checkbox"/> Gloves <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Beacons <input type="checkbox"/> Safety Cones <input checked="" type="checkbox"/> First Aid Kit <input checked="" type="checkbox"/> Fire Extinguisher <input checked="" type="checkbox"/> Eye Wash/ Drinking Water	<input checked="" type="checkbox"/> Cell/Satellite Phone <input type="checkbox"/> Digital Camera <input type="checkbox"/> iPad <input type="checkbox"/> <input type="checkbox"/>		<input checked="" type="checkbox"/> Stay Visible <input checked="" type="checkbox"/> Equipment Inspection <input checked="" type="checkbox"/> Work in Pairs <input checked="" type="checkbox"/> Safety Control/Traffic Plan <input type="checkbox"/>	
<b>Job Steps</b>	<b>Potential Hazards</b>	<b>Critical Actions to Mitigate Hazards</b>			
<b>Pre-Job Activities</b>	Example: Unfamiliar locations, congestion, unpaved roads, Mechanical Failure, Flat Tires Vehicle Fire, Exhaust Leaks, Vehicle Collision, Internal Projectiles	<ul style="list-style-type: none"> <li>■ Inspect the vehicle before departure:               <ul style="list-style-type: none"> <li>▪ Check for tire cuts, fluid leaks, flat tires, body damage, windshield cracks, and other damage.</li> <li>▪ Check lights, wipers, fluid levels, and seat belts.</li> </ul> </li> <li>■ Study the area maps, photos and use GPS and compass skills.</li> <li>■ Identify the safest spot to park field vehicles.</li> </ul>			
<b>Familiarize crew with the task and location of site</b>	Crew does not notify site owner / manager. Unaware of the job site hazards and steps to prevent injury. Appropriate personnel protective equipment not worn.  Other Hazards	<ul style="list-style-type: none"> <li>■ Example: Conduct a tailgate safety meeting discussing the jobs, the hazards and actions that will be taken to prevent injury.</li> <li>■ Discuss "Stop Work Authority" as it applies to each site member.</li> <li>■ Discuss appropriate PPE including high visibility clothing such as reflective vest.</li> <li>■ Notify attendant and/or site owner/manager of work activities and location.</li> <li>■ Discuss appropriate PPE including high visibility clothing such as reflective vest.</li> <li>■ Set up exclusion zone surrounding work area.</li> </ul>			



<p><b>Driving to work site location (Highway Driving)</b></p>	<p>Unfamiliar road, Mechanical Failure, Flat Tires, Vehicle Fire, Vehicle Collision.</p> <p>Other Hazards</p>	<ul style="list-style-type: none"> <li>■ Inspect the vehicle before departure: <ul style="list-style-type: none"> <li>○ Check for tire cuts, fluid leaks, flat tires, body damage, windshield cracks, and other damage.</li> <li>○ Check lights, wipers, fluid levels, and seat belts.</li> </ul> </li> <li>■ Study the area maps, photos and use GPS and compass skills.</li> <li>■ Use only vehicles appropriate for the work needs and the driving conditions expected.</li> <li>■ Ensure the vehicle has a complete and current first aid kit and fire extinguisher.</li> <li>■ Place heavy objects behind a secure safety cage if they must be carried in a passenger compartment.</li> <li>■ Use parking brake, and don't leave vehicle unattended while it is running.</li> <li>■ Ensure vehicle has fuel to get to and from your destinations.</li> <li>■ Inform your Project Manager of your destination and estimated time of return.</li> <li>■ Carry extra food, water, and clothing.</li> <li>■ Drive defensively.</li> </ul>
<p><b>Driving on Unimproved Roads (Off-Highway Driving)</b></p>	<p>Encountering Other Vehicles on Narrow</p> <p>Unfamiliar Road,</p> <p>Narrow, Rough Roads, Animal / Object Collision,</p> <p>Running / Skidding Off Road, Icy / Muddy Roads</p> <p>Flying Debris (Rocks, etc.), Poor Visibility</p> <p>Backing, Run-Away Vehicle, Roadway Obstacles</p> <p>Project Manager unaware of location.</p>	<ul style="list-style-type: none"> <li>■ Stay on the main roadway. Pull over on firm ground and avoid soft shoulders, if a stop is necessary.</li> <li>■ Drive on maintained trails when possible.</li> <li>■ Drive with care in tall brush and grass. Watch for wildlife, fallen trees, rocks, and other obstacles.</li> <li>■ Slow down, especially on corners. Maintain a safe speed at all times.</li> <li>■ Follow from a safe distance.</li> <li>■ Know when and how to use 4WD.</li> <li>■ Use only vehicles appropriate to the road conditions. Learn these conditions before you go.</li> <li>■ Pull over to allow larger vehicles (i.e.: trucks and trailers) to pass from either direction.</li> <li>■ Don't travel the road at all if there is high potential for vehicle damage.</li> <li>■ Park so that backing up will not be necessary.</li> <li>■ Use a spotter or get out to check behind vehicle.</li> </ul>

		<ul style="list-style-type: none"> <li>■ Use ground guide to walk the path on questionable roadways.</li> <li>■ When removing debris from the roadway, use care, lift properly, and use proper equipment and PPE.</li> <li>■ When descending a long grade, use lower gears to control speed rather than brakes.</li> <li>■ Keep vehicle well ventilated by opening a window at least 6 inches, when idling or heating for a period.</li> <li>■ Keep all windows clear of snow, ice, mud, and anything else obstructing the driver's view.</li> <li>■ Keep vehicle windows clean, inside and out, and washer fluid full. Replace damaged or worn wipers.</li> </ul>
<p><b>Traveling on Foot</b></p>	<p>Falls, Foot Injuries, and Stress and Impact Injuries</p> <p>Forest Fires</p> <p>Lightning</p> <p>Personal Safety</p>	<ul style="list-style-type: none"> <li>■ Identify and use safe travel routes. Do not exceed physical abilities or equipment design.</li> <li>■ Use pack equipment properly. Carry weight on hips, not back.</li> <li>■ Warm up and stretch the appropriate muscle groups before and after hitting the trail.</li> <li>■ Test and use secure footing. Move cautiously and deliberately. Never run.</li> <li>■ In heavy undergrowth, particularly off-trail, slow down and watch carefully.</li> <li>■ Carry tools on the downhill side.</li> <li>■ Wear safety-toed boots with good, non-skid soles that are tall enough to support ankles.</li> <li>■ Know basic first aid. Completion of a basic first aid course is required.</li> <li>■ Use footwear appropriate to the terrain and load being carried.</li> <li>■ Know how to fall. Roll, protect the head and neck, and do not extend arms to break the fall.</li> <li>■ Wear fire retardant clothing</li> <li>■ Refer to GeoEngineers Personal Safety Program - Never you're your personal safety. Leave the area and contact your Project Manager.</li> <li>■ Travel on maintained trails when possible.</li> </ul>
	<p>Biological Hazards</p>	<ul style="list-style-type: none"> <li>■ Discuss applicable hazard mitigation measures - Insects, Snakes, Wildlife, Vegetation</li> </ul>

<b>Slope Evaluation</b>	Slips, Trips and Falls	<ul style="list-style-type: none"> <li>■ Travel on maintained trails when possible.</li> <li>■ Take extra precautions when encountering steep, loose, wet trail conditions.</li> <li>■ Always carry tools on your downhill side.</li> <li>■ Use a rope for stability if needed / tie off to trees / have throw rope with on-shore buddy.</li> <li>■ Take slow deliberate steps as conditions dictate.</li> <li>■ Use a flashlight after dark.</li> <li>■ Travel after dark only in an emergency.</li> <li>■ Wear appropriate footwear for conditions.</li> </ul>
<b>Communication</b>	Additional Hazards, i.e., No communication in case of emergency	<ul style="list-style-type: none"> <li>■ Verify cell phone is working.</li> <li>■ Maintain communication with Project Manager throughout job task.</li> <li>■ Verify location and contact numbers for emergency medical assistance or 911.</li> </ul>
	Additional Hazards, i.e., Emergency	<ul style="list-style-type: none"> <li>■ <b>Dial 911</b></li> <li>■ Hospital Route (Attached Fall Protection Plan)</li> </ul>
<b>Required Control Measures:</b> (check the box when complete)		
<input type="checkbox"/> Perform a pre-work vehicle inspection (First Aid kit, fire extinguisher).		
<input type="checkbox"/> Drive defensively looking out for the other guy.		
<input type="checkbox"/> Conduct a pre-work safety meeting.		
<input type="checkbox"/> Use a Safety Watch to monitor equipment Minimum Approach Distance (MAD) and to keep personnel clear if needed.		
<input type="checkbox"/> Wear Personal Protective Equipment (PPE).		
<input type="checkbox"/> Ensure training is current (First Aid, defensive driving, etc.).		
<input type="checkbox"/> Conduct Task Safety Assessments throughout the job.		
<b>Additional Comments:</b>		
Click here to enter text.		

### DAILY HAZARD ASSESSMENT RECORD OF SAFETY MEETINGS

**Signature**

**Date**

**Signature**

**Date**

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**FORM 4  
ACCIDENT/EXPOSURE REPORT FORM  
CLE ELUM CITY SITE ASSESSMENT  
FILE NO. 0504-177-00**

To (Supervisor): \_\_\_\_\_ From (Employee): \_\_\_\_\_

Telephone  
(with area code): \_\_\_\_\_

Name of injured or ill employee: \_\_\_\_\_

Date of accident: \_\_\_\_\_ Time of accident: \_\_\_\_\_ Exact location of accident: \_\_\_\_\_

Narrative description of: **accident/exposure** (circle one):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Medical attention given on site:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Nature of illness or injury and part of body involved: \_\_\_\_\_ Lost Time? Yes  No

**Probably Disability (check one):**

Fatal	Lost work day with days away from work	Lost work day with days of restricted activity	No lost work day	First Aid only
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Corrective action taken by reporting unit and corrective action that remains to be taken (by whom and when):  
\_\_\_\_\_  
\_\_\_\_\_

Employee  
Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name of  
Supervisor: \_\_\_\_\_

**ATTACHMENT A  
COVID-19 SUPPLEMENTARY JHA**



<b>Project Name:</b> <b>File No:</b>		<b>Date:</b>	<b>Site Location:</b>
<b>Application:</b>			
This COVID-19 supplementary JHA is designed to meet the requirements of GeoEngineers' Field Safety During COVID-19 protocols and the COVID-19 Response Plan as well as the recommendations provided by the Centers for Disease Control and Prevention (CDC) and other applicable state or federal agencies.			
<b>PPE/Supplies/Actions Equipment:</b> (select those applicable to this jobsite )			
<b>PPE</b>	<b>Supplies</b>	<b>Tools</b>	<b>Actions</b>
<input type="checkbox"/> Eye Protection  <input type="checkbox"/> Gloves  <input type="checkbox"/> Cloth Face Covering <input type="checkbox"/> N95 Mask  <input type="checkbox"/> Disposable Coveralls	<input type="checkbox"/> Hand Washing Soap  <input type="checkbox"/> Hand Washing Water Supply  <input type="checkbox"/> Hand Sanitizer  <input type="checkbox"/> Sanitizing Wipes	<input type="checkbox"/> Cell Phone/Satellite  <input type="checkbox"/> Scanning Thermometer  <input type="checkbox"/> Water Basin	<input type="checkbox"/> Maximize Social Distance (≥6ft) <input type="checkbox"/> Meeting Location Planning  <input type="checkbox"/> Hand Washing  <input type="checkbox"/> High Touch Surface Sanitation
<b>Job Steps</b>	<b>Potential Hazard</b>	<b>Critical Actions to Mitigate Hazard</b>	
Mobilization to worksite	Transmission of COVID-19 Virus	<ul style="list-style-type: none"> <li>■ Pack hand sanitizer and wipes for use during all modes of business travel.</li> <li>■ Assign hand sanitizer to vehicle when able.</li> <li>■ Sanitize "high touch" areas: keys, steering wheels, dash controls, door handles, mirror adjustments, shifter, blinkers, head rests, etc.</li> <li>■ Re-Fueling: Use sampling gloves or wash hands after using the pump at a gas station. When possible, do this before you get back into the vehicle.</li> <li>■ Intra-Site Transportation: Maintain social distancing on transport skiffs or multi- passenger ATVs. Request multiple trips if overcrowded. Keep your field PPE on during travel.</li> </ul>	

<p>Pre-work Safety Meetings</p>	<p>Transmission of COVID-19 Virus</p>	<ul style="list-style-type: none"> <li>■ Review site maps, photos and routes prior to site arrival to anticipate present staffing or public density areas.</li> <li>■ Conduct a tailgate safety meeting in location that can accommodate greater than 6 feet social distancing.</li> <li>■ Keep group sizes as small as possible (<math>\leq 10</math> people or smaller depending on individual state guidance).</li> <li>■ Meeting attendance should be verbally announced and recorded by a single representative to avoid contact with shared supplies/equipment/computers/work surfaces.</li> <li>■ Use verbal greetings. Do not shake hands, hug, fist bump, or high five.</li> <li>■ Wear face coverings if social distances cannot be maintained.</li> <li>■ Use own supply of pens, notebooks and similar field supplies.</li> </ul>
<p>Site Operations</p>	<p>Transmission of COVID-19 Virus</p>	<ul style="list-style-type: none"> <li>■ Maximize social distances to the greatest extent feasible.</li> <li>■ If tasks or locations require sharing workspaces in proximity to others with less than 6 feet separation, wear a face covering.</li> <li>■ Sanitize shared tools or equipment.</li> <li>■ Use own vehicle as site office rather than shared spaces.</li> <li>■ Wash ungloved hands after contacting shared surfaces.</li> <li>■ Sanitize personal items regularly (cell phone, water bottle, clipboards, notebooks).</li> <li>■ Set up exclusion zones surrounding public interface areas if less than 6 feet separation.</li> <li>■ Wear face covering if traveling off site for lunch/coffee/supplies and recommended social distances cannot be maintained.</li> <li>■ Leave job site if experiencing onset of COVID-19 symptoms.</li> </ul>
<p>Positive or Assumed Positive COVID-19 Result at Job Site</p>	<p>Transmission of COVID-19 Virus</p>	<ul style="list-style-type: none"> <li>■ Contact your manager as soon as information is received of a positive or assumed positive result on the jobsite.</li> <li>■ Determine if you have had close and prolonged personal proximity to the individual.</li> <li>■ Based on proximity, you may be asked to remove yourself from the worksite.</li> <li>■ Your manager will provide guidance for how to proceed safely following worksite withdrawal.</li> </ul>

**Additional Comments:**







**APPENDIX C**  
**Chemical Analytical Laboratory Reports**

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**Project:** Cle Elum City – Site Assessment  
May 2021 Soil and Groundwater Samples

**GEI File No:** 00504-177-00

**Date:** June 15, 2021

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This report documents the results of a United States Environmental Protection Agency (EPA)-defined Stage 2A data validation (EPA Document 540-R-08-005; EPA, 2009) of analytical data from the analyses of soil and groundwater samples collected as part of the May 2021 sampling events, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the Cle Elum City site located at the southwest corner of 1st Street and Billings Avenue in Cle Elum, Washington.

### Objective and Quality Control Elements

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the EPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review (EPA, 2020) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with the Quality Assurance Project Plan (QAPP), Appendix B of the Work Plan (GeoEngineers, 2021), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method and Trip Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Sample Duplicates
- Laboratory/Field Duplicates
- Miscellaneous

### Validated Sample Delivery Groups

This data validation included review of the sample delivery groups (SDGs) listed below in Table 1.

**TABLE 1: SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS**

Laboratory SDG	Samples Validated
590-15072-1	GEI037-MW-5-050321, GEI037-DUP-050321, Trip Blank
590-15221-1	GEI037-B1 (8-8.6), GEI037-B1-052521, GEI037-B2 (5.5-6), GEI037-B2-052521, GEI037-B3 (5-5.5), GEI037-B3-052521, GEI037-DUP-052521, Trip Blank

### Chemical Analysis Performed

Eurofins TestAmerica Laboratories, Inc. (TestAmerica), located in Spokane, Washington, performed laboratory analyses on the samples using one or more of the following methods:

- Gasoline-Range Hydrocarbons (NWTPH-Gx) by Method NWTPH-Gx;
- Petroleum Hydrocarbons (NWTPH-Dx) by Method NWTPH-Dx; and
- Volatile Organic Compounds (VOCs) by Method EPA8260D

### Data Validation Summary

The results for each of the QC elements are summarized below.

#### Data Package Completeness

TestAmerica provided the required deliverables for the data validation according to the National Functional Guidelines. The laboratory followed adequate corrective action processes and the identified anomalies were discussed in the relevant laboratory case narrative.

#### Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COCs were accurate and complete when submitted to the laboratory, with the following exception:

**SDG 590-15221-1:** The laboratory noted that a water trip blank sample was received, but not filled; therefore, the requested analysis was canceled for this sample.

#### Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for each analysis. The sample coolers arrived at the laboratory within the appropriate temperatures of between 2 and 6 degrees Celsius, with the exception noted below.

**SDG 590-15072-1:** The sample cooler temperature recorded at the laboratory was 1.7 degrees Celsius. It was determined through professional judgment, that since the samples were not frozen when received by the laboratory, this temperature should not affect the sample analytical results.

#### Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in an environmental sample. Surrogates are used for organic analyses and are added to the samples, standards, and blanks to serve as an accuracy and specificity check of each

analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. The surrogate percent recoveries for field samples were within the laboratory control limits.

## **Method and Trip Blanks**

### Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For each sample batch, method blanks for the applicable methods were analyzed at the required frequency. None of the analytes of interest were detected in the method blanks.

### Trip Blanks

Trip blanks are analyzed to provide an indication as to whether volatile compounds have cross-contaminated other like samples within the transportation process to the laboratory. None of the analytes of interest were detected in the trip blanks.

## **Matrix Spikes/Matrix Spike Duplicates**

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated.

A laboratory control sample/laboratory control sample duplicate (LCS/LCSD) sample set was performed in lieu of a MS/MSD analysis.

## **Laboratory Control Samples/Laboratory Control Sample Duplicates**

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to each sample in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for each analysis and the percent recovery and RPD values were within the proper control limits.

## **Laboratory Duplicates**

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or

more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in the laboratory documents. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

### Field Duplicates

In order to assess precision, field duplicate samples were collected and analyzed along with the reviewed sample batches. The duplicate samples were analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the RPD between each pair of samples. If one or more of the sample analytes has a concentration less than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limits are specified in the QAPP.

**SDG 590-15072-1:** One field duplicate sample pair, GEI037-MW-5-050321 and GEI037-DUP-050321, was submitted with this SDG. The precision criteria for the target analytes were met for this sample pair.

**SDG 590-15221-1:** One field duplicate sample pair, GEI037-B3-052521 and GEI037-DUP-052521, was submitted with this SDG. The precision criteria for the target analytes were met for this sample pair.

### Miscellaneous

**SDG 590-15221-1:** (NWTPH-Dx) The laboratory noted that positive result for diesel-range hydrocarbons in Sample GEI037-B3 (5-5.5) appeared to be due to heavily weathered diesel, which may bias the reported sample concentration. For this reason, the positive result for diesel-range hydrocarbons was qualified as estimated (J) in this sample.

### Overall Assessment

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate and LCS/LCSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD and laboratory/field duplicate RPD values.

The data are acceptable for the intended use, with the following qualification listed below in Table 2.

**TABLE 2: SUMMARY OF QUALIFIED SAMPLES**

Sample ID	Analyte	Qualifier	Reason
GEI037-B3 (5-5.5)	Diesel-range hydrocarbons	J	See Miscellaneous

### References

GeoEngineers, Inc. (GeoEngineers). "Work Plan, Cle Elum City," prepared for Washington State Department of Ecology. May 4, 2021.

U.S. Environmental Protection Agency (EPA). "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

U.S. Environmental Protection Agency (EPA). "Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review," EPA-540-R-20-005. November 2020.

## ANALYTICAL REPORT

Eurofins TestAmerica, Spokane  
11922 East 1st Ave  
Spokane, WA 99206  
Tel: (509)924-9200

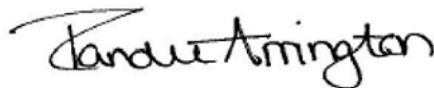
Laboratory Job ID: 590-15072-1

Client Project/Site: Cle Elum City Site/0504-177-00

**For:**

GeoEngineers Inc  
523 East Second Ave  
Spokane, Washington 99202

Attn: JR Sugalski



*Authorized for release by:  
5/14/2021 10:25:39 AM*

Randee Arrington, Lab Director  
(509)924-9200

[Randee.Arrington@Eurofinset.com](mailto:Randee.Arrington@Eurofinset.com)

### LINKS

Review your project  
results through  
**TotalAccess**

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Visit us at:

[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

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**Job ID: 590-15072-1**

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**Laboratory: Eurofins TestAmerica, Spokane**

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## Narrative

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### Receipt

The samples were received on 5/4/2021 2:55 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7° C.

### GC/MS VOA

Method 8260D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 590-31584.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### GC Semi VOA

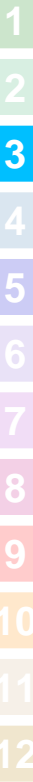
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### VOA Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.





# Sample Summary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
590-15072-1	GEI037-MW-5-050321	Water	05/03/21 11:45	05/04/21 14:55	
590-15072-2	GEI037-DUP-050321	Water	05/03/21 11:00	05/04/21 14:55	
590-15072-3	Trip Blank	Water	05/03/21 11:00	05/04/21 14:55	

1

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# Definitions/Glossary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# Client Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

**Client Sample ID: GEI037-MW-5-050321**

**Lab Sample ID: 590-15072-1**

**Date Collected: 05/03/21 11:45**

**Matrix: Water**

**Date Received: 05/04/21 14:55**

## Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/12/21 17:33	1
Ethylbenzene	ND		1.0		ug/L			05/12/21 17:33	1
m,p-Xylene	ND		2.0		ug/L			05/12/21 17:33	1
o-Xylene	ND		1.0		ug/L			05/12/21 17:33	1
Toluene	ND		1.0		ug/L			05/12/21 17:33	1
Xylenes, Total	ND		3.0		ug/L			05/12/21 17:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		80 - 120		05/12/21 17:33	1
4-Bromofluorobenzene (Surr)	99		80 - 120		05/12/21 17:33	1
Dibromofluoromethane (Surr)	106		80 - 120		05/12/21 17:33	1
Toluene-d8 (Surr)	99		80 - 120		05/12/21 17:33	1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/12/21 17:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141		05/12/21 17:33	1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/07/21 14:29	05/10/21 12:55	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		05/07/21 14:29	05/10/21 12:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	84		50 - 150	05/07/21 14:29	05/10/21 12:55	1
n-Triacontane-d62	82		50 - 150	05/07/21 14:29	05/10/21 12:55	1

**Client Sample ID: GEI037-DUP-050321**

**Lab Sample ID: 590-15072-2**

**Date Collected: 05/03/21 11:00**

**Matrix: Water**

**Date Received: 05/04/21 14:55**

## Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/12/21 18:16	1
Ethylbenzene	ND		1.0		ug/L			05/12/21 18:16	1
m,p-Xylene	ND		2.0		ug/L			05/12/21 18:16	1
o-Xylene	ND		1.0		ug/L			05/12/21 18:16	1
Toluene	ND		1.0		ug/L			05/12/21 18:16	1
Xylenes, Total	ND		3.0		ug/L			05/12/21 18:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		80 - 120		05/12/21 18:16	1
4-Bromofluorobenzene (Surr)	99		80 - 120		05/12/21 18:16	1
Dibromofluoromethane (Surr)	105		80 - 120		05/12/21 18:16	1
Toluene-d8 (Surr)	98		80 - 120		05/12/21 18:16	1

Eurofins TestAmerica, Spokane

# Client Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

**Client Sample ID: GEI037-DUP-050321**

**Lab Sample ID: 590-15072-2**

Date Collected: 05/03/21 11:00

Matrix: Water

Date Received: 05/04/21 14:55

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/12/21 18:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141					05/12/21 18:16	1

**Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		05/07/21 14:29	05/10/21 13:15	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		05/07/21 14:29	05/10/21 13:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	86		50 - 150				05/07/21 14:29	05/10/21 13:15	1
n-Triacontane-d62	83		50 - 150				05/07/21 14:29	05/10/21 13:15	1

**Client Sample ID: Trip Blank**

**Lab Sample ID: 590-15072-3**

Date Collected: 05/03/21 11:00

Matrix: Water

Date Received: 05/04/21 14:55

**Method: 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/12/21 18:38	1
Ethylbenzene	ND		1.0		ug/L			05/12/21 18:38	1
m,p-Xylene	ND		2.0		ug/L			05/12/21 18:38	1
o-Xylene	ND		1.0		ug/L			05/12/21 18:38	1
Toluene	ND		1.0		ug/L			05/12/21 18:38	1
Xylenes, Total	ND		3.0		ug/L			05/12/21 18:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		80 - 120					05/12/21 18:38	1
4-Bromofluorobenzene (Surr)	99		80 - 120					05/12/21 18:38	1
Dibromofluoromethane (Surr)	109		80 - 120					05/12/21 18:38	1
Toluene-d8 (Surr)	102		80 - 120					05/12/21 18:38	1

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/12/21 18:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141					05/12/21 18:38	1

# QC Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

## Method: 8260D - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 590-31584/10**  
**Matrix: Water**  
**Analysis Batch: 31584**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/12/21 12:52	1
Ethylbenzene	ND		1.0		ug/L			05/12/21 12:52	1
m,p-Xylene	ND		2.0		ug/L			05/12/21 12:52	1
o-Xylene	ND		1.0		ug/L			05/12/21 12:52	1
Toluene	ND		1.0		ug/L			05/12/21 12:52	1
Xylenes, Total	ND		3.0		ug/L			05/12/21 12:52	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		80 - 120		05/12/21 12:52	1
4-Bromofluorobenzene (Surr)	101		80 - 120		05/12/21 12:52	1
Dibromofluoromethane (Surr)	102		80 - 120		05/12/21 12:52	1
Toluene-d8 (Surr)	103		80 - 120		05/12/21 12:52	1

**Lab Sample ID: MB 590-31584/14**  
**Matrix: Water**  
**Analysis Batch: 31584**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			05/12/21 14:19	1
Ethylbenzene	ND		1.0		ug/L			05/12/21 14:19	1
m,p-Xylene	ND		2.0		ug/L			05/12/21 14:19	1
o-Xylene	ND		1.0		ug/L			05/12/21 14:19	1
Toluene	ND		1.0		ug/L			05/12/21 14:19	1
Xylenes, Total	ND		3.0		ug/L			05/12/21 14:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		80 - 120		05/12/21 14:19	1
4-Bromofluorobenzene (Surr)	101		80 - 120		05/12/21 14:19	1
Dibromofluoromethane (Surr)	105		80 - 120		05/12/21 14:19	1
Toluene-d8 (Surr)	102		80 - 120		05/12/21 14:19	1

**Lab Sample ID: LCS 590-31584/1007**  
**Matrix: Water**  
**Analysis Batch: 31584**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	10.4		ug/L		104	80 - 126
Ethylbenzene	10.0	9.95		ug/L		99	80 - 128
m,p-Xylene	10.0	9.75		ug/L		97	80 - 127
o-Xylene	10.0	9.73		ug/L		97	80 - 126
Toluene	10.0	9.76		ug/L		98	80 - 129

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		80 - 120
4-Bromofluorobenzene (Surr)	100		80 - 120
Dibromofluoromethane (Surr)	105		80 - 120
Toluene-d8 (Surr)	97		80 - 120

# QC Sample Results

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCSD 590-31584/8**  
**Matrix: Water**  
**Analysis Batch: 31584**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	10.5		ug/L		105	80 - 126	1	18
Ethylbenzene	10.0	10.3		ug/L		103	80 - 128	3	18
m,p-Xylene	10.0	10.3		ug/L		103	80 - 127	6	18
o-Xylene	10.0	10.1		ug/L		101	80 - 126	3	17
Toluene	10.0	10.0		ug/L		100	80 - 129	3	18

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		80 - 120
4-Bromofluorobenzene (Surr)	101		80 - 120
Dibromofluoromethane (Surr)	100		80 - 120
Toluene-d8 (Surr)	98		80 - 120

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

**Lab Sample ID: MB 590-31585/14**  
**Matrix: Water**  
**Analysis Batch: 31585**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			05/12/21 14:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		68.7 - 141		05/12/21 14:19	1

**Lab Sample ID: LCS 590-31585/1013**  
**Matrix: Water**  
**Analysis Batch: 31585**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1000	1060		ug/L		106	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	106		68.7 - 141

**Lab Sample ID: LCSD 590-31585/1024**  
**Matrix: Water**  
**Analysis Batch: 31585**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	1000	967		ug/L		97	80 - 120	9	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	105		68.7 - 141

# QC Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

**Lab Sample ID: MB 590-31531/1-A**  
**Matrix: Water**  
**Analysis Batch: 31515**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 31531**

Analyte	MB MB		RL	MDL	Unit	D	Prepared		Analyzed		Dil Fac
	Result	Qualifier									
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		05/07/21 14:29	05/07/21 18:04			1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		05/07/21 14:29	05/07/21 18:04			1
Surrogate	MB MB		Limits	Prepared		Analyzed		Dil Fac			
	%Recovery	Qualifier									
<i>o</i> -Terphenyl	84		50 - 150			05/07/21 14:29	05/07/21 18:04	1			
<i>n</i> -Triacontane-d62	87		50 - 150			05/07/21 14:29	05/07/21 18:04	1			

**Lab Sample ID: LCS 590-31531/2-A**  
**Matrix: Water**  
**Analysis Batch: 31515**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 31531**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
Diesel Range Organics (DRO) (C10-C25)	1.60	1.39		mg/L		87	50 - 150	
Residual Range Organics (RRO) (C25-C36)	1.60	1.70		mg/L		106	50 - 150	
Surrogate	LCS LCS		Limits					
	%Recovery	Qualifier						
<i>o</i> -Terphenyl	90		50 - 150					
<i>n</i> -Triacontane-d62	90		50 - 150					

**Lab Sample ID: LCSD 590-31531/3-A**  
**Matrix: Water**  
**Analysis Batch: 31515**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 31531**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	
									RPD	Limit
Diesel Range Organics (DRO) (C10-C25)	1.60	1.30		mg/L		81	50 - 150	7	25	
Residual Range Organics (RRO) (C25-C36)	1.60	1.59		mg/L		100	50 - 150	6	25	
Surrogate	LCSD LCSD		Limits							
	%Recovery	Qualifier								
<i>o</i> -Terphenyl	87		50 - 150							
<i>n</i> -Triacontane-d62	87		50 - 150							

# Lab Chronicle

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

**Client Sample ID: GEI037-MW-5-050321**

**Lab Sample ID: 590-15072-1**

**Date Collected: 05/03/21 11:45**

**Matrix: Water**

**Date Received: 05/04/21 14:55**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	31584	05/12/21 17:33	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	31585	05/12/21 17:33	JSP	TAL SPK
Total/NA	Prep	3510C			261.8 mL	2 mL	31531	05/07/21 14:29	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31538	05/10/21 12:55	NMI	TAL SPK

**Client Sample ID: GEI037-DUP-050321**

**Lab Sample ID: 590-15072-2**

**Date Collected: 05/03/21 11:00**

**Matrix: Water**

**Date Received: 05/04/21 14:55**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	31584	05/12/21 18:16	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	31585	05/12/21 18:16	JSP	TAL SPK
Total/NA	Prep	3510C			259.3 mL	2 mL	31531	05/07/21 14:29	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31538	05/10/21 13:15	NMI	TAL SPK

**Client Sample ID: Trip Blank**

**Lab Sample ID: 590-15072-3**

**Date Collected: 05/03/21 11:00**

**Matrix: Water**

**Date Received: 05/04/21 14:55**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	31584	05/12/21 18:38	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	31585	05/12/21 18:38	JSP	TAL SPK

**Laboratory References:**

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200



# Accreditation/Certification Summary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

## Laboratory: Eurofins TestAmerica, Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-06-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
NWTPH-Dx	3510C	Water	Residual Range Organics (RRO) (C25-C36)

# Method Summary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15072-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	TAL SPK
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC/MS)	NWTPH	TAL SPK
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL SPK
5030C	Purge and Trap	SW846	TAL SPK

#### Protocol References:

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

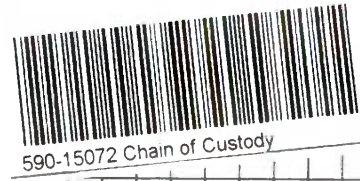
TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Spokane, WA 99206  
Phone: 509.924.9200 Fax:

014211

Regulatory Program:  DW  NPDES  RCRA  Other:

Client Contact		Project Manager: Jr Sugalski		Site Contact:		Date: 5/4/21		COC No: /	
Company Name: GeoEngineers, Inc		Tel/Fax:		Lab Contact:		Carrier:		/ of / COCs	
Address: 523 E 2nd Ave		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS / MSD (Y/N) BTEX / 9260D NWTPH-GX NWTPH-DA				Sampler: Justin Orr	
City/State/Zip: Spokane WA 99202		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS						For Lab Use Only:	
Phone: 509.363.3125		TAT if different from Below						Walk-in Client:	
Fax:		<input checked="" type="checkbox"/> 2 weeks						Lab Sampling:	
Project Name: Cle Elum City Site		<input type="checkbox"/> 1 week						Job / SDG No.:	
Site:		<input type="checkbox"/> 2 days							
PO# 0504-177-00		<input type="checkbox"/> 1 day							
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:			
GE1037-mw-S-050321	5/3/21	1145	G	W	3	X	X	X	
GE1037-DUP-050321	5/3/21	1100	G	W	3	X	X	X	
Trip Blank	5/2/21	1100	G	W	1	X	X		
<p>Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other</p> <p>Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.</p> <p><input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown</p> <p>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</p> <p><input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months</p>									
Special Instructions/QC Requirements & Comments:									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 2.0		Corr'd: 1.7		Therm ID No.: 116009	
Relinquished by: [Signature]		Company: GEI		Date/Time: 5-4-21/1455		Received by: [Signature]		Company: TASP	
Relinquished by:		Company:		Date/Time:		Received by:		Company:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:	



# Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-15072-1

**Login Number: 15072**  
**List Number: 1**  
**Creator: O'Toole, Maria C**

**List Source: Eurofins TestAmerica, Spokane**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.



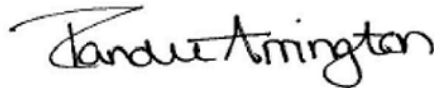
## ANALYTICAL REPORT

Eurofins TestAmerica, Spokane  
11922 East 1st Ave  
Spokane, WA 99206  
Tel: (509)924-9200

Laboratory Job ID: 590-15221-1  
Client Project/Site: Cle Elum City Site/0504-177-00

For:  
GeoEngineers Inc  
523 East Second Ave  
Spokane, Washington 99202

Attn: JR Sugalski



Authorized for release by:  
6/8/2021 2:23:37 PM

Randee Arrington, Lab Director  
(509)924-9200  
[Randee.Arrington@Eurofinset.com](mailto:Randee.Arrington@Eurofinset.com)

### LINKS

Review your project  
results through  
**Total Access**

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[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

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## Job ID: 590-15221-1

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Laboratory: Eurofins TestAmerica, Spokane

### Narrative

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#### Receipt

The samples were received on 5/28/2021 8:05 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.1° C.

#### Receipt Exceptions

Client submitted a water Trip Blank that was labeled but not filled; therefore, the analysis was canceled.

#### GC/MS VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### GC Semi VOA

Method NWTPH-Dx: Detected hydrocarbons in the diesel range appear to be due to heavily weathered diesel as well as oil overlap in the following sample: GEI037-B3 (5-5.5) (590-15221-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### VOA Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
590-15221-1	GEI037-B1 (8-8.6)	Solid	05/25/21 08:50	05/28/21 08:05	
590-15221-2	GEI037-B2 (5.5-6)	Solid	05/25/21 09:10	05/28/21 08:05	
590-15221-3	GEI037-B3 (5-5.5)	Solid	05/25/21 09:25	05/28/21 08:05	
590-15221-4	Trip Blank	Solid	05/25/21 08:00	05/28/21 08:05	
590-15221-5	GEI037-B1-052521	Water	05/25/21 10:03	05/28/21 08:05	
590-15221-6	GEI037-B2-052521	Water	05/25/21 10:28	05/28/21 08:05	
590-15221-7	GEI037-B3-052521	Water	05/25/21 10:53	05/28/21 08:05	
590-15221-8	GEI037-DUP-052521	Water	05/25/21 08:00	05/28/21 08:05	



# Definitions/Glossary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# Client Sample Results

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-B1 (8-8.6)**

**Lab Sample ID: 590-15221-1**

Date Collected: 05/25/21 08:50

Matrix: Solid

Date Received: 05/28/21 08:05

Percent Solids: 96.0

## Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.023		mg/Kg	☼	05/28/21 16:22	05/29/21 00:50	1
Ethylbenzene	ND		0.11		mg/Kg	☼	05/28/21 16:22	05/29/21 00:50	1
m,p-Xylene	ND		0.45		mg/Kg	☼	05/28/21 16:22	05/29/21 00:50	1
o-Xylene	ND		0.23		mg/Kg	☼	05/28/21 16:22	05/29/21 00:50	1
Toluene	ND		0.11		mg/Kg	☼	05/28/21 16:22	05/29/21 00:50	1
Xylenes, Total	ND		0.68		mg/Kg	☼	05/28/21 16:22	05/29/21 00:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		75 - 129	05/28/21 16:22	05/29/21 00:50	1
4-Bromofluorobenzene (Surr)	98		76 - 122	05/28/21 16:22	05/29/21 00:50	1
Dibromofluoromethane (Surr)	102		80 - 120	05/28/21 16:22	05/29/21 00:50	1
Toluene-d8 (Surr)	103		80 - 120	05/28/21 16:22	05/29/21 00:50	1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		5.7		mg/Kg	☼	05/28/21 16:22	05/29/21 00:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		41.5 - 162	05/28/21 16:22	05/29/21 00:50	1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg	☼	06/04/21 13:21	06/04/21 17:24	1
Residual Range Organics (RRO) (C25-C36)	ND		26		mg/Kg	☼	06/04/21 13:21	06/04/21 17:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	73		50 - 150	06/04/21 13:21	06/04/21 17:24	1
n-Triacontane-d62	59		50 - 150	06/04/21 13:21	06/04/21 17:24	1

**Client Sample ID: GEI037-B2 (5.5-6)**

**Lab Sample ID: 590-15221-2**

Date Collected: 05/25/21 09:10

Matrix: Solid

Date Received: 05/28/21 08:05

Percent Solids: 96.3

## Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.022		mg/Kg	☼	05/28/21 16:22	05/29/21 01:54	1
Ethylbenzene	ND		0.11		mg/Kg	☼	05/28/21 16:22	05/29/21 01:54	1
m,p-Xylene	ND		0.44		mg/Kg	☼	05/28/21 16:22	05/29/21 01:54	1
o-Xylene	ND		0.22		mg/Kg	☼	05/28/21 16:22	05/29/21 01:54	1
Toluene	ND		0.11		mg/Kg	☼	05/28/21 16:22	05/29/21 01:54	1
Xylenes, Total	ND		0.66		mg/Kg	☼	05/28/21 16:22	05/29/21 01:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		75 - 129	05/28/21 16:22	05/29/21 01:54	1
4-Bromofluorobenzene (Surr)	113		76 - 122	05/28/21 16:22	05/29/21 01:54	1
Dibromofluoromethane (Surr)	100		80 - 120	05/28/21 16:22	05/29/21 01:54	1
Toluene-d8 (Surr)	103		80 - 120	05/28/21 16:22	05/29/21 01:54	1

Eurofins TestAmerica, Spokane

# Client Sample Results

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-B2 (5.5-6)**

**Lab Sample ID: 590-15221-2**

Date Collected: 05/25/21 09:10

Matrix: Solid

Date Received: 05/28/21 08:05

Percent Solids: 96.3

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		5.5		mg/Kg	☼	05/28/21 16:22	05/29/21 01:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	113		41.5 - 162				05/28/21 16:22	05/29/21 01:54	1

**Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg	☼	06/04/21 13:21	06/04/21 17:45	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg	☼	06/04/21 13:21	06/04/21 17:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	79		50 - 150				06/04/21 13:21	06/04/21 17:45	1
n-Triacontane-d62	68		50 - 150				06/04/21 13:21	06/04/21 17:45	1

**Client Sample ID: GEI037-B3 (5-5.5)**

**Lab Sample ID: 590-15221-3**

Date Collected: 05/25/21 09:25

Matrix: Solid

Date Received: 05/28/21 08:05

Percent Solids: 96.7

**Method: 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.022		mg/Kg	☼	05/28/21 16:22	05/29/21 02:15	1
Ethylbenzene	ND		0.11		mg/Kg	☼	05/28/21 16:22	05/29/21 02:15	1
m,p-Xylene	ND		0.45		mg/Kg	☼	05/28/21 16:22	05/29/21 02:15	1
o-Xylene	ND		0.22		mg/Kg	☼	05/28/21 16:22	05/29/21 02:15	1
Toluene	ND		0.11		mg/Kg	☼	05/28/21 16:22	05/29/21 02:15	1
Xylenes, Total	ND		0.67		mg/Kg	☼	05/28/21 16:22	05/29/21 02:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		75 - 129				05/28/21 16:22	05/29/21 02:15	1
4-Bromofluorobenzene (Surr)	93		76 - 122				05/28/21 16:22	05/29/21 02:15	1
Dibromofluoromethane (Surr)	98		80 - 120				05/28/21 16:22	05/29/21 02:15	1
Toluene-d8 (Surr)	102		80 - 120				05/28/21 16:22	05/29/21 02:15	1

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		5.6		mg/Kg	☼	05/28/21 16:22	05/29/21 02:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		41.5 - 162				05/28/21 16:22	05/29/21 02:15	1

**Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	67		10		mg/Kg	☼	06/04/21 13:21	06/04/21 18:06	1
Residual Range Organics (RRO) (C25-C36)	450		25		mg/Kg	☼	06/04/21 13:21	06/04/21 18:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	82		50 - 150				06/04/21 13:21	06/04/21 18:06	1
n-Triacontane-d62	68		50 - 150				06/04/21 13:21	06/04/21 18:06	1

Eurofins TestAmerica, Spokane

# Client Sample Results

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: Trip Blank**

**Lab Sample ID: 590-15221-4**

Date Collected: 05/25/21 08:00

Matrix: Solid

Date Received: 05/28/21 08:05

## Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.019		mg/Kg		05/28/21 16:22	05/29/21 02:36	1
Ethylbenzene	ND		0.097		mg/Kg		05/28/21 16:22	05/29/21 02:36	1
m,p-Xylene	ND		0.39		mg/Kg		05/28/21 16:22	05/29/21 02:36	1
o-Xylene	ND		0.19		mg/Kg		05/28/21 16:22	05/29/21 02:36	1
Toluene	ND		0.097		mg/Kg		05/28/21 16:22	05/29/21 02:36	1
Xylenes, Total	ND		0.58		mg/Kg		05/28/21 16:22	05/29/21 02:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		75 - 129	05/28/21 16:22	05/29/21 02:36	1
4-Bromofluorobenzene (Surr)	97		76 - 122	05/28/21 16:22	05/29/21 02:36	1
Dibromofluoromethane (Surr)	103		80 - 120	05/28/21 16:22	05/29/21 02:36	1
Toluene-d8 (Surr)	99		80 - 120	05/28/21 16:22	05/29/21 02:36	1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		4.8		mg/Kg		05/28/21 16:22	05/29/21 02:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		41.5 - 162	05/28/21 16:22	05/29/21 02:36	1

**Client Sample ID: GEI037-B1-052521**

**Lab Sample ID: 590-15221-5**

Date Collected: 05/25/21 10:03

Matrix: Water

Date Received: 05/28/21 08:05

## Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			06/03/21 12:14	1
Ethylbenzene	ND		1.0		ug/L			06/03/21 12:14	1
m,p-Xylene	ND		2.0		ug/L			06/03/21 12:14	1
o-Xylene	ND		1.0		ug/L			06/03/21 12:14	1
Toluene	ND		1.0		ug/L			06/03/21 12:14	1
Xylenes, Total	ND		3.0		ug/L			06/03/21 12:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		80 - 120		06/03/21 12:14	1
4-Bromofluorobenzene (Surr)	99		80 - 120		06/03/21 12:14	1
Dibromofluoromethane (Surr)	106		80 - 120		06/03/21 12:14	1
Toluene-d8 (Surr)	98		80 - 120		06/03/21 12:14	1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			06/03/21 12:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141		06/03/21 12:14	1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		06/03/21 11:12	06/03/21 18:29	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		06/03/21 11:12	06/03/21 18:29	1

Eurofins TestAmerica, Spokane

# Client Sample Results

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-B1-052521**

**Lab Sample ID: 590-15221-5**

Date Collected: 05/25/21 10:03

Matrix: Water

Date Received: 05/28/21 08:05

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	73		50 - 150	06/03/21 11:12	06/03/21 18:29	1
<i>n</i> -Triacontane-d62	63		50 - 150	06/03/21 11:12	06/03/21 18:29	1

**Client Sample ID: GEI037-B2-052521**

**Lab Sample ID: 590-15221-6**

Date Collected: 05/25/21 10:28

Matrix: Water

Date Received: 05/28/21 08:05

**Method: 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			06/03/21 12:37	1
Ethylbenzene	ND		1.0		ug/L			06/03/21 12:37	1
<i>m,p</i> -Xylene	ND		2.0		ug/L			06/03/21 12:37	1
<i>o</i> -Xylene	ND		1.0		ug/L			06/03/21 12:37	1
Toluene	ND		1.0		ug/L			06/03/21 12:37	1
Xylenes, Total	ND		3.0		ug/L			06/03/21 12:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>1,2</i> -Dichloroethane-d4 (Surr)	107		80 - 120		06/03/21 12:37	1
<i>4</i> -Bromofluorobenzene (Surr)	95		80 - 120		06/03/21 12:37	1
<i>Dibromofluoromethane</i> (Surr)	109		80 - 120		06/03/21 12:37	1
<i>Toluene-d8</i> (Surr)	101		80 - 120		06/03/21 12:37	1

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			06/03/21 12:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>4</i> -Bromofluorobenzene (Surr)	95		68.7 - 141		06/03/21 12:37	1

**Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		06/03/21 11:12	06/03/21 18:50	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		06/03/21 11:12	06/03/21 18:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	78		50 - 150	06/03/21 11:12	06/03/21 18:50	1
<i>n</i> -Triacontane-d62	69		50 - 150	06/03/21 11:12	06/03/21 18:50	1

**Client Sample ID: GEI037-B3-052521**

**Lab Sample ID: 590-15221-7**

Date Collected: 05/25/21 10:53

Matrix: Water

Date Received: 05/28/21 08:05

**Method: 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			06/03/21 12:59	1
Ethylbenzene	ND		1.0		ug/L			06/03/21 12:59	1
<i>m,p</i> -Xylene	ND		2.0		ug/L			06/03/21 12:59	1
<i>o</i> -Xylene	ND		1.0		ug/L			06/03/21 12:59	1
Toluene	ND		1.0		ug/L			06/03/21 12:59	1
Xylenes, Total	ND		3.0		ug/L			06/03/21 12:59	1

Eurofins TestAmerica, Spokane

# Client Sample Results

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-B3-052521**

**Lab Sample ID: 590-15221-7**

Date Collected: 05/25/21 10:53

Matrix: Water

Date Received: 05/28/21 08:05

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		80 - 120		06/03/21 12:59	1
4-Bromofluorobenzene (Surr)	101		80 - 120		06/03/21 12:59	1
Dibromofluoromethane (Surr)	109		80 - 120		06/03/21 12:59	1
Toluene-d8 (Surr)	102		80 - 120		06/03/21 12:59	1

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			06/03/21 12:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		68.7 - 141		06/03/21 12:59	1

**Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		06/03/21 11:12	06/03/21 19:11	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		06/03/21 11:12	06/03/21 19:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	70		50 - 150	06/03/21 11:12	06/03/21 19:11	1
n-Triacontane-d62	69		50 - 150	06/03/21 11:12	06/03/21 19:11	1

**Client Sample ID: GEI037-DUP-052521**

**Lab Sample ID: 590-15221-8**

Date Collected: 05/25/21 08:00

Matrix: Water

Date Received: 05/28/21 08:05

**Method: 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			06/03/21 13:21	1
Ethylbenzene	ND		1.0		ug/L			06/03/21 13:21	1
m,p-Xylene	ND		2.0		ug/L			06/03/21 13:21	1
o-Xylene	ND		1.0		ug/L			06/03/21 13:21	1
Toluene	ND		1.0		ug/L			06/03/21 13:21	1
Xylenes, Total	ND		3.0		ug/L			06/03/21 13:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		80 - 120		06/03/21 13:21	1
4-Bromofluorobenzene (Surr)	99		80 - 120		06/03/21 13:21	1
Dibromofluoromethane (Surr)	111		80 - 120		06/03/21 13:21	1
Toluene-d8 (Surr)	105		80 - 120		06/03/21 13:21	1

**Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			06/03/21 13:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141		06/03/21 13:21	1

**Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		06/03/21 11:12	06/03/21 19:32	1

Eurofins TestAmerica, Spokane

# Client Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-DUP-052521**

**Lab Sample ID: 590-15221-8**

**Date Collected: 05/25/21 08:00**

**Matrix: Water**

**Date Received: 05/28/21 08:05**

**Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		06/03/21 11:12	06/03/21 19:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	77		50 - 150				06/03/21 11:12	06/03/21 19:32	1
<i>n</i> -Triacontane-d62	75		50 - 150				06/03/21 11:12	06/03/21 19:32	1



# QC Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

## Method: 8260D - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 590-31788/1-A**  
**Matrix: Solid**  
**Analysis Batch: 31790**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 31788**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	ND		0.020		mg/Kg		05/28/21 16:22	05/28/21 18:01	1
Ethylbenzene	ND		0.10		mg/Kg		05/28/21 16:22	05/28/21 18:01	1
m,p-Xylene	ND		0.40		mg/Kg		05/28/21 16:22	05/28/21 18:01	1
o-Xylene	ND		0.20		mg/Kg		05/28/21 16:22	05/28/21 18:01	1
Toluene	ND		0.10		mg/Kg		05/28/21 16:22	05/28/21 18:01	1
Xylenes, Total	ND		0.60		mg/Kg		05/28/21 16:22	05/28/21 18:01	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	91		75 - 129	05/28/21 16:22	05/28/21 18:01	1
4-Bromofluorobenzene (Surr)	98		76 - 122	05/28/21 16:22	05/28/21 18:01	1
Dibromofluoromethane (Surr)	98		80 - 120	05/28/21 16:22	05/28/21 18:01	1
Toluene-d8 (Surr)	105		80 - 120	05/28/21 16:22	05/28/21 18:01	1

**Lab Sample ID: LCS 590-31788/2-A**  
**Matrix: Solid**  
**Analysis Batch: 31790**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 31788**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylbenzene	0.500	0.588		mg/Kg		118	77 - 126
m,p-Xylene	0.500	0.578		mg/Kg		116	78 - 130
o-Xylene	0.500	0.556		mg/Kg		111	77 - 129
Toluene	0.500	0.581		mg/Kg		116	77 - 131

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	90		75 - 129
4-Bromofluorobenzene (Surr)	94		76 - 122
Dibromofluoromethane (Surr)	96		80 - 120
Toluene-d8 (Surr)	96		80 - 120

**Lab Sample ID: 590-15221-1 DU**  
**Matrix: Solid**  
**Analysis Batch: 31790**

**Client Sample ID: GEI037-B1 (8-8.6)**  
**Prep Type: Total/NA**  
**Prep Batch: 31788**

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Benzene	ND		ND		mg/Kg	⊛	NC	25
Ethylbenzene	ND		ND		mg/Kg	⊛	NC	25
m,p-Xylene	ND		ND		mg/Kg	⊛	NC	23
o-Xylene	ND		ND		mg/Kg	⊛	NC	25
Toluene	ND		ND		mg/Kg	⊛	NC	25
Xylenes, Total	ND		ND		mg/Kg	⊛	NC	25

Surrogate	DU	DU	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	91		75 - 129
4-Bromofluorobenzene (Surr)	95		76 - 122
Dibromofluoromethane (Surr)	97		80 - 120
Toluene-d8 (Surr)	102		80 - 120



# QC Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 590-31830/6**  
**Matrix: Water**  
**Analysis Batch: 31830**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			06/03/21 11:52	1
Ethylbenzene	ND		1.0		ug/L			06/03/21 11:52	1
m,p-Xylene	ND		2.0		ug/L			06/03/21 11:52	1
o-Xylene	ND		1.0		ug/L			06/03/21 11:52	1
Toluene	ND		1.0		ug/L			06/03/21 11:52	1
Xylenes, Total	ND		3.0		ug/L			06/03/21 11:52	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		80 - 120		06/03/21 11:52	1
4-Bromofluorobenzene (Surr)	99		80 - 120		06/03/21 11:52	1
Dibromofluoromethane (Surr)	102		80 - 120		06/03/21 11:52	1
Toluene-d8 (Surr)	98		80 - 120		06/03/21 11:52	1

**Lab Sample ID: LCS 590-31830/1003**  
**Matrix: Water**  
**Analysis Batch: 31830**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	8.90		ug/L		89	80 - 126
Ethylbenzene	10.0	9.00		ug/L		90	80 - 128
m,p-Xylene	10.0	8.92		ug/L		89	80 - 127
o-Xylene	10.0	8.72		ug/L		87	80 - 126
Toluene	10.0	8.94		ug/L		89	80 - 129

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		80 - 120
4-Bromofluorobenzene (Surr)	98		80 - 120
Dibromofluoromethane (Surr)	101		80 - 120
Toluene-d8 (Surr)	102		80 - 120

**Lab Sample ID: LCSD 590-31830/4**  
**Matrix: Water**  
**Analysis Batch: 31830**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	9.95		ug/L		99	80 - 126	11	18
Ethylbenzene	10.0	10.0		ug/L		100	80 - 128	11	18
m,p-Xylene	10.0	10.0		ug/L		100	80 - 127	12	18
o-Xylene	10.0	9.92		ug/L		99	80 - 126	13	17
Toluene	10.0	10.2		ug/L		102	80 - 129	14	18

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		80 - 120
4-Bromofluorobenzene (Surr)	97		80 - 120
Dibromofluoromethane (Surr)	100		80 - 120
Toluene-d8 (Surr)	102		80 - 120

# QC Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

**Lab Sample ID: MB 590-31788/1-A**  
**Matrix: Solid**  
**Analysis Batch: 31789**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 31788**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		5.0		mg/Kg		05/28/21 16:22	05/28/21 18:01	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		41.5 - 162				05/28/21 16:22	05/28/21 18:01	1

**Lab Sample ID: LCS 590-31788/3-A**  
**Matrix: Solid**  
**Analysis Batch: 31789**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 31788**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	50.0	54.9		mg/Kg		110	74.4 - 124
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	101		41.5 - 162				

**Lab Sample ID: 590-15221-1 DU**  
**Matrix: Solid**  
**Analysis Batch: 31789**

**Client Sample ID: GEI037-B1 (8-8.6)**  
**Prep Type: Total/NA**  
**Prep Batch: 31788**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Gasoline	ND		ND		mg/Kg	⊛	NC	32.3
Surrogate	DU %Recovery	DU Qualifier	Limits					
4-Bromofluorobenzene (Surr)	95		41.5 - 162					

**Lab Sample ID: MB 590-31831/6**  
**Matrix: Water**  
**Analysis Batch: 31831**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			06/03/21 11:52	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68.7 - 141					06/03/21 11:52	1

**Lab Sample ID: LCS 590-31831/1005**  
**Matrix: Water**  
**Analysis Batch: 31831**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1000	981		ug/L		98	80 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	103		68.7 - 141				

# QC Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

## Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS) (Continued)

**Lab Sample ID: LCSD 590-31831/1027**  
**Matrix: Water**  
**Analysis Batch: 31831**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	1000	1030		ug/L		103	80 - 120	5	20
<b>Surrogate</b>	<b>%Recovery</b>	<b>LCSD Qualifier</b>	<b>Limits</b>						
4-Bromofluorobenzene (Surr)	104		68.7 - 141						

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

**Lab Sample ID: MB 590-31832/1-A**  
**Matrix: Water**  
**Analysis Batch: 31833**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 31832**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		06/03/21 11:12	06/03/21 13:16	1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		06/03/21 11:12	06/03/21 13:16	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>MB Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
o-Terphenyl	75		50 - 150				06/03/21 11:12	06/03/21 13:16	1
n-Triacontane-d62	64		50 - 150				06/03/21 11:12	06/03/21 13:16	1

**Lab Sample ID: LCS 590-31832/2-A**  
**Matrix: Water**  
**Analysis Batch: 31833**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 31832**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics (DRO) (C10-C25)	1.60	1.25		mg/L		78	50 - 150
Residual Range Organics (RRO) (C25-C36)	1.60	1.40		mg/L		88	50 - 150
<b>Surrogate</b>	<b>%Recovery</b>	<b>LCS Qualifier</b>	<b>Limits</b>				
o-Terphenyl	78		50 - 150				
n-Triacontane-d62	66		50 - 150				

**Lab Sample ID: LCSD 590-31832/3-A**  
**Matrix: Water**  
**Analysis Batch: 31833**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 31832**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	1.60	1.27		mg/L		79	50 - 150	1	25
Residual Range Organics (RRO) (C25-C36)	1.60	1.47		mg/L		92	50 - 150	4	25
<b>Surrogate</b>	<b>%Recovery</b>	<b>LCSD Qualifier</b>	<b>Limits</b>						
o-Terphenyl	80		50 - 150						
n-Triacontane-d62	76		50 - 150						

# QC Sample Results

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

**Lab Sample ID: MB 590-31851/1-A**  
**Matrix: Solid**  
**Analysis Batch: 31847**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 31851**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg		06/04/21 13:21	06/04/21 15:40	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg		06/04/21 13:21	06/04/21 15:40	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
<i>o</i> -Terphenyl	74		50 - 150				06/04/21 13:21	06/04/21 15:40	1
<i>n</i> -Triacontane-d62	69		50 - 150				06/04/21 13:21	06/04/21 15:40	1

**Lab Sample ID: LCS 590-31851/2-A**  
**Matrix: Solid**  
**Analysis Batch: 31847**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 31851**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits		
								%Rec.	
Diesel Range Organics (DRO) (C10-C25)	66.7	62.8		mg/Kg		94	50 - 150		
Residual Range Organics (RRO) (C25-C36)	66.7	66.9		mg/Kg		100	50 - 150		
Surrogate	LCS LCS		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
<i>o</i> -Terphenyl	90		50 - 150						
<i>n</i> -Triacontane-d62	77		50 - 150						

**Lab Sample ID: 590-15221-1 DU**  
**Matrix: Solid**  
**Analysis Batch: 31847**

**Client Sample ID: GEI037-B1 (8-8.6)**  
**Prep Type: Total/NA**  
**Prep Batch: 31851**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD	
								RPD	Limit
Diesel Range Organics (DRO) (C10-C25)	ND		ND		mg/Kg	☼	NC		40
Residual Range Organics (RRO) (C25-C36)	ND		ND		mg/Kg	☼	NC		40
Surrogate	DU DU		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
<i>o</i> -Terphenyl	75		50 - 150						
<i>n</i> -Triacontane-d62	65		50 - 150						

# Lab Chronicle

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-B1 (8-8.6)**  
 Date Collected: 05/25/21 08:50  
 Date Received: 05/28/21 08:05

**Lab Sample ID: 590-15221-1**  
 Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			31783	05/28/21 12:53	AMB	TAL SPK

**Client Sample ID: GEI037-B1 (8-8.6)**  
 Date Collected: 05/25/21 08:50  
 Date Received: 05/28/21 08:05

**Lab Sample ID: 590-15221-1**  
 Matrix: Solid  
 Percent Solids: 96.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			9.513 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	8260D		1	0.86 mL	43 mL	31790	05/29/21 00:50	JSP	TAL SPK
Total/NA	Prep	5035			9.513 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	0.86 mL	43 mL	31789	05/29/21 00:50	JSP	TAL SPK
Total/NA	Prep	3550C			15.13 g	5 mL	31851	06/04/21 13:21	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31847	06/04/21 17:24	NMI	TAL SPK

**Client Sample ID: GEI037-B2 (5.5-6)**  
 Date Collected: 05/25/21 09:10  
 Date Received: 05/28/21 08:05

**Lab Sample ID: 590-15221-2**  
 Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			31783	05/28/21 12:53	AMB	TAL SPK

**Client Sample ID: GEI037-B2 (5.5-6)**  
 Date Collected: 05/25/21 09:10  
 Date Received: 05/28/21 08:05

**Lab Sample ID: 590-15221-2**  
 Matrix: Solid  
 Percent Solids: 96.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			9.854 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	8260D		1	0.86 mL	43 mL	31790	05/29/21 01:54	JSP	TAL SPK
Total/NA	Prep	5035			9.854 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	0.86 mL	43 mL	31789	05/29/21 01:54	JSP	TAL SPK
Total/NA	Prep	3550C			15.40 g	5 mL	31851	06/04/21 13:21	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31847	06/04/21 17:45	NMI	TAL SPK

**Client Sample ID: GEI037-B3 (5.5-5)**  
 Date Collected: 05/25/21 09:25  
 Date Received: 05/28/21 08:05

**Lab Sample ID: 590-15221-3**  
 Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			31783	05/28/21 12:53	AMB	TAL SPK

# Lab Chronicle

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-B3 (5-5.5)**  
**Date Collected: 05/25/21 09:25**  
**Date Received: 05/28/21 08:05**

**Lab Sample ID: 590-15221-3**  
**Matrix: Solid**  
**Percent Solids: 96.7**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			9.545 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	8260D		1	0.86 mL	43 mL	31790	05/29/21 02:15	JSP	TAL SPK
Total/NA	Prep	5035			9.545 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	0.86 mL	43 mL	31789	05/29/21 02:15	JSP	TAL SPK
Total/NA	Prep	3550C			15.28 g	5 mL	31851	06/04/21 13:21	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31847	06/04/21 18:06	NMI	TAL SPK

**Client Sample ID: Trip Blank**  
**Date Collected: 05/25/21 08:00**  
**Date Received: 05/28/21 08:05**

**Lab Sample ID: 590-15221-4**  
**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			10.33 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	8260D		1	0.86 mL	43 mL	31790	05/29/21 02:36	JSP	TAL SPK
Total/NA	Prep	5035			10.33 g	10 mL	31788	05/28/21 16:22	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	0.86 mL	43 mL	31789	05/29/21 02:36	JSP	TAL SPK

**Client Sample ID: GEI037-B1-052521**  
**Date Collected: 05/25/21 10:03**  
**Date Received: 05/28/21 08:05**

**Lab Sample ID: 590-15221-5**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	31830	06/03/21 12:14	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	31831	06/03/21 12:14	JSP	TAL SPK
Total/NA	Prep	3510C			258.8 mL	2 mL	31832	06/03/21 11:12	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31833	06/03/21 18:29	NMI	TAL SPK

**Client Sample ID: GEI037-B2-052521**  
**Date Collected: 05/25/21 10:28**  
**Date Received: 05/28/21 08:05**

**Lab Sample ID: 590-15221-6**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	31830	06/03/21 12:37	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	31831	06/03/21 12:37	JSP	TAL SPK
Total/NA	Prep	3510C			256.3 mL	2 mL	31832	06/03/21 11:12	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31833	06/03/21 18:50	NMI	TAL SPK

**Client Sample ID: GEI037-B3-052521**  
**Date Collected: 05/25/21 10:53**  
**Date Received: 05/28/21 08:05**

**Lab Sample ID: 590-15221-7**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	31830	06/03/21 12:59	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	31831	06/03/21 12:59	JSP	TAL SPK

# Lab Chronicle

Client: GeoEngineers Inc  
 Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

**Client Sample ID: GEI037-B3-052521**

**Lab Sample ID: 590-15221-7**

**Date Collected: 05/25/21 10:53**

**Matrix: Water**

**Date Received: 05/28/21 08:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			265.4 mL	2 mL	31832	06/03/21 11:12	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31833	06/03/21 19:11	NMI	TAL SPK

**Client Sample ID: GEI037-DUP-052521**

**Lab Sample ID: 590-15221-8**

**Date Collected: 05/25/21 08:00**

**Matrix: Water**

**Date Received: 05/28/21 08:05**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	43 mL	43 mL	31830	06/03/21 13:21	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	31831	06/03/21 13:21	JSP	TAL SPK
Total/NA	Prep	3510C			264.5 mL	2 mL	31832	06/03/21 11:12	NMI	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			31833	06/03/21 19:32	NMI	TAL SPK

**Laboratory References:**

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

# Accreditation/Certification Summary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

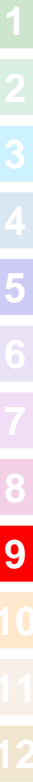
## Laboratory: Eurofins TestAmerica, Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-06-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids
NWTPH-Dx	3510C	Water	Residual Range Organics (RRO) (C25-C36)
NWTPH-Dx	3550C	Solid	Residual Range Organics (RRO) (C25-C36)





# Method Summary

Client: GeoEngineers Inc  
Project/Site: Cle Elum City Site/0504-177-00

Job ID: 590-15221-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	TAL SPK
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC/MS)	NWTPH	TAL SPK
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL SPK
3550C	Ultrasonic Extraction	SW846	TAL SPK
5030C	Purge and Trap	SW846	TAL SPK
5035	Closed System Purge and Trap	SW846	TAL SPK

#### Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200



# Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-15221-1

**Login Number: 15221**

**List Number: 1**

**Creator: O'Toole, Maria C**

**List Source: Eurofins TestAmerica, Spokane**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.



**APPENDIX D**  
**Report Limitations and Guidelines for Use**

## **APPENDIX D REPORT LIMITATIONS AND GUIDELINES FOR USE<sup>1</sup>**

This Appendix provides information to help you manage your risks with respect to the use of this report.

### **Environmental Services Are Performed for Specific Purposes, Persons and Projects**

This report has been prepared for the exclusive use of the Washington State Department of Ecology (Ecology). This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Ecology should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

### **This Environmental Report is Based on a Unique Set of Project-Specific Factors**

This report has been prepared for the Cle Elum City site located at the southwest corner of 1<sup>st</sup> Street and Billings Avenue in Cle Elum, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

### **Reliance Conditions for Third Parties**

Our report was prepared for the exclusive use of Ecology. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm and Ecology with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services

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<sup>1</sup> Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; [www.asfe.org](http://www.asfe.org).

have been executed in accordance with our Agreement with Ecology and generally accepted environmental practices in this area at the time this report was prepared.

### **Environmental Regulations are Always Evolving**

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

### **Uncertainty May Remain Even After This Phase II ESA is Completed**

No ESA can wholly eliminate uncertainty regarding the potential for contamination in connection with a property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled or analyzed.

### **Subsurface Conditions Can Change**

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

### **Most Environmental Findings are Professional Opinions**

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

### **Do Not Redraw the Exploration Logs**

Environmental scientists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in an environmental report should never be redrawn for inclusion in other design drawings. Only photographic or electronic reproductions are acceptable but recognize that separating logs from the report can elevate risk.

### **Read These Provisions Closely**

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations”

provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site.

### **Geotechnical, Geologic and Geoenvironmental Reports Should Not be Interchanged**

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

### **Biological Pollutants**

GeoEngineers’ Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term “Biological Pollutants” includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Ecology desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

