Data Gap Investigation

Model Remedy LUST Sites
Yakima City Fire Department
401 North Front Street
Yakima, Washington

for
Washington State Department of Ecology

December 29, 2016

GeoEngineers
Earth Science + Technology

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523 East Second Avenue
Spokane, Washington 99202
509.363.3125

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Model Remedy LUST Sites
Yakima City Fire Department
401 North Front Street
Yakima, Washington

File No. 0504-125-00

December 29, 2016

Prepared for:

Washington State Department of Ecology
Toxics Cleanup Program – Central Region Office
1250 West Alder Street
Union Gap, Washington 98903

Attention: Jeff Newschwander

Prepared by:

GeoEngineers, Inc.
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APP:SHL:BDW:tjh

Table of Contents

1.0 INTRODUCTION

This report describes soil assessment activities conducted at the Yakima City Fire Department site located at 401 North Front Street in Yakima, Washington (herein referred to as "site"). The approximate site location is shown in the attached Vicinity Map, Figure 1.

Site environmental activities are managed by the Washington State Department of Ecology (Ecology). This report describes field activities, observations and chemical analytical results associated with soil samples collected at the site. The purpose of the assessment activities described herein was to identify if remnant soil contamination associated with former underground storage tank (UST) operation was present beneath the site. Ecology will use the assessment results to conduct a Site Hazard Assessment (SHA), if necessary, or close the site.

2.0 SITE DESCRIPTION AND BACKGROUND

The site includes the Yakima City Fire Department building and a paved parking area. The site is bounded by commercial structures to the north, an alleyway and restaurant to the east, East D Street to the south and North Front Street to the west, as shown in Figure 1.

On November 18, 1997, a 500-gallon diesel UST and a 500-gallon gasoline UST, located in the northeast alley adjacent to the building, were decommissioned and removed. Petroleum-impacted soil was observed under the fuel dispensers. Analytical results from a soil sample collected at a depth of about 9 feet below ground surface (bgs) beneath the fuel dispensers indicated a diesel-range petroleum hydrocarbons (DRPH) concentration (20,000 milligrams per kilogram [mg/kg]) exceeded the Model Toxics Control Act (MTCA) Method A cleanup level (2,000 mg/kg). Petroleum-impacted soil was not completely removed near the dispensers because of the proximity of the nearby fire station building and associated concerns of undermining the building. Other soil samples collected from the UST excavation detected benzene, toluene, ethylbenzene, total xylenes (BTEX) and DRPH at concentrations that did not exceed MTCA Method A cleanup levels.

3.0 SCOPE OF SERVICES

The scope of services included the following:

1. Prepared a Master Work Plan that included a Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), and Health and Safety Plan (HASP).
2. Coordinated underground utility locating using the one-call system and Utilities Plus, a private utility locator. Per state regulations, the proposed boring locations were marked prior to initiating the locate request.
3. Coordinated subcontractors (drillers, locators and waste disposal contractors) and provided project management services.
4. Conducted field assessment activities including the following:

a. Observing Environmental West Explorations, Inc. (Environmental West) drill three soil borings (B-1 through B-3) using air rotary drilling techniques. Soil samples were collected using a Standard Penetration Test (SPT) sampler.

b. Observing and documenting subsurface soil conditions. At least one soil sample was retained for field screening and potential chemical analysis. Field screening consisted of photo-ionization detector (PID) screening, visual observation and water-sheen testing.

c. Drumming and labeling investigation-derived waste (IDW).

5. Submitting one soil sample from each boring to TestAmerica Laboratories, Inc. (TestAmerica) for chemical analysis. Soil samples were submitted for analysis of DRPH and oil-range petroleum hydrocarbons (ORPH) using Northwest Method NWTPH-Dx.
6. Entering analytical data into Ecology's Environmental Information Management (EIM) database.
7. Preparing this assessment report.

4.0 FIELD ACTIVITIES

4.1. General

Field assessment activities were conducted on November 7 and 8, 2016. Site utilities, located near the boring locations, were identified and marked by Utilities Plus prior to drilling. Environmental West advanced three borings (B-1 through B-3) near or within the former UST excavation using air-rotary drilling methods. The boring locations are summarized by the following:

- Soil boring B-1 was drilled within the southern portion of the former UST excavation to about 16 feet below ground surface. Soil samples were obtained from the 4- and 12-foot-depth intervals for potential chemical analysis.
- Soil boring B-2 was drilled within the northeast portion of the former UST excavation to a depth of about 16 feet bgs. Soil samples were collected from the 4½- and 9½-foot-depth intervals for potential chemical analysis.
- Soil boring B-3 was drilled at the northern margin of the former UST excavation to a depth of about 15½ feet bgs. Soil samples were collected from the 4- and 9½-foot-depth intervals for potential chemical analysis.

Environmental West backfilled each boring with bentonite. Excess soil cuttings were placed in a 55-gallon steel drum, labeled and placed at a location approved by the site employees (depicted on Site Plan, Figure 2). Boring logs associated with the borings are included in Appendix A.

4.2. Subsurface Conditions

Observed soil conditions were consistent in the borings with fine to coarse gravel with trace sand, silt cobbles and boulders observed. Groundwater was not encountered during drilling operations.

4.3. Field Screening and Sampling

Soil samples from each boring were field-screened for the potential presence of petroleum contamination by PID, visual examination and water-sheen testing. PID headspace vapor measurements were not

measured above 1 part per million (ppm). Field screening procedures are further described in Appendix A. Contaminated soil field screening indicators were not observed in collected soil samples. Soil samples from the three borings were collected in laboratory-supplied containers for chemical analysis.

5.0 CHEMICAL ANALYTICAL RESULTS

5.1. Soil Chemical Analytical Results

Three soil samples were submitted to TestAmerica for the chemical analyses described in "Section 3.0 Scope of Services." The samples were submitted from boring B-1, B-2, and B-3 depth intervals of 9½ and 12 feet bgs. Evidence of field screening contamination was not observed in soil samples collected from each boring. TestAmerica's laboratory report is included in Appendix B; 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 1.

DRPH and ORPH were not detected greater than the laboratory method reporting limit in the three samples submitted.

TABLE 1. SUMMARY OF CHEMICAL ANALYTICAL RESULTS - SOIL

Sample Identification	Date Samples	DRPH[1] (mg/kg)	ORPH[1] (mg/kg)
Site-8: B-1 (9.5-9.75)	11/07/16	<10	<26
Site-8: B-2 (9.5-9.75)	11/07/16	<9.8	<25
Site-8: B-3 (12-12.25)	11/07/16	<10	<25
MTCA Method A CUL[2]		2,000	2,000

Notes:

[1]DRPH and ORPH analyzed using Northwest Method NWTPH-Dx

[2]MTCA Method A CUL - Washington State Model Toxics Control Act Method A unrestricted land use cleanup level

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Soil assessment activities were conducted November 7 and 8, 2016, at the Yakima City Fire Department site located at 401 North Front Street in Yakima, Washington. Three soil borings (B-1 through B-3) were each advanced to depths ranging between 15 and 16 feet bgs. Observed soil consisted of fine to coarse gravel with sand, and cobbles and boulders. Groundwater was not encountered in the borings.

One soil sample from each boring was submitted for DRPH and ORPH analysis. DRPH and ORPH were not detected in the submitted samples. Based on the chemical analytical results, in our opinion, a SHA ranking is unnecessary and we recommend a No Further Action designation for the site.

Based on the chemical analytical results, IDW concentrations do not exceed MTCA Method A unrestricted land use cleanup levels and can therefore be reused onsite or disposed as solid waste. The accumulated IDW amounted to two full 55-gallon drums. Alternatively, a contractor can be retained to pick up, transport and dispose the IDW at an appropriate facility.

7.0 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.

Any electronic form, facsimile or hard copy of the original document (email, text, table and/or figure), if provided, and any attachments should be considered a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

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

FIGURES

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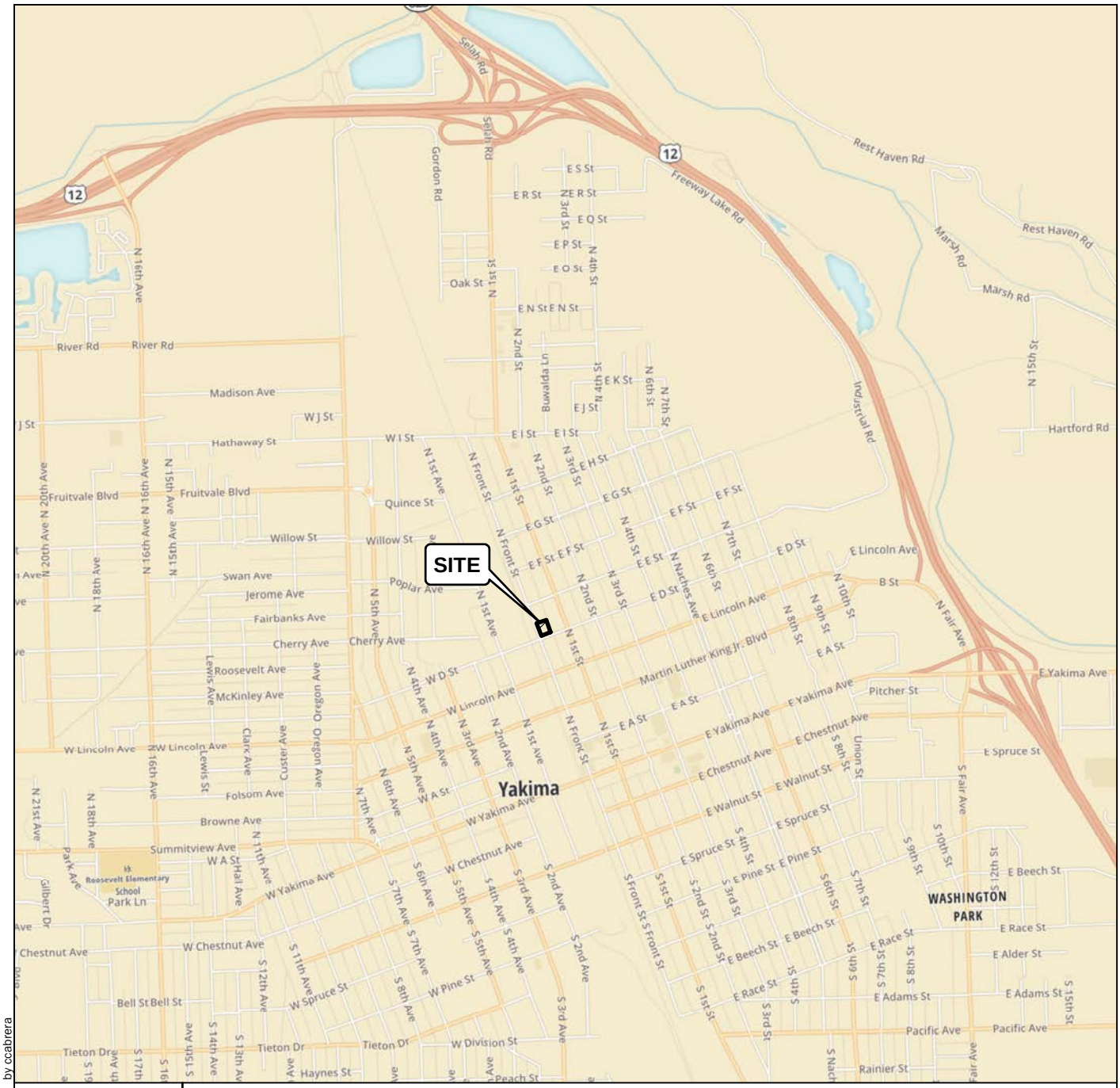

Notes:

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: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Yakima City Fire Department
401 North Front Street
Yakima, Washington

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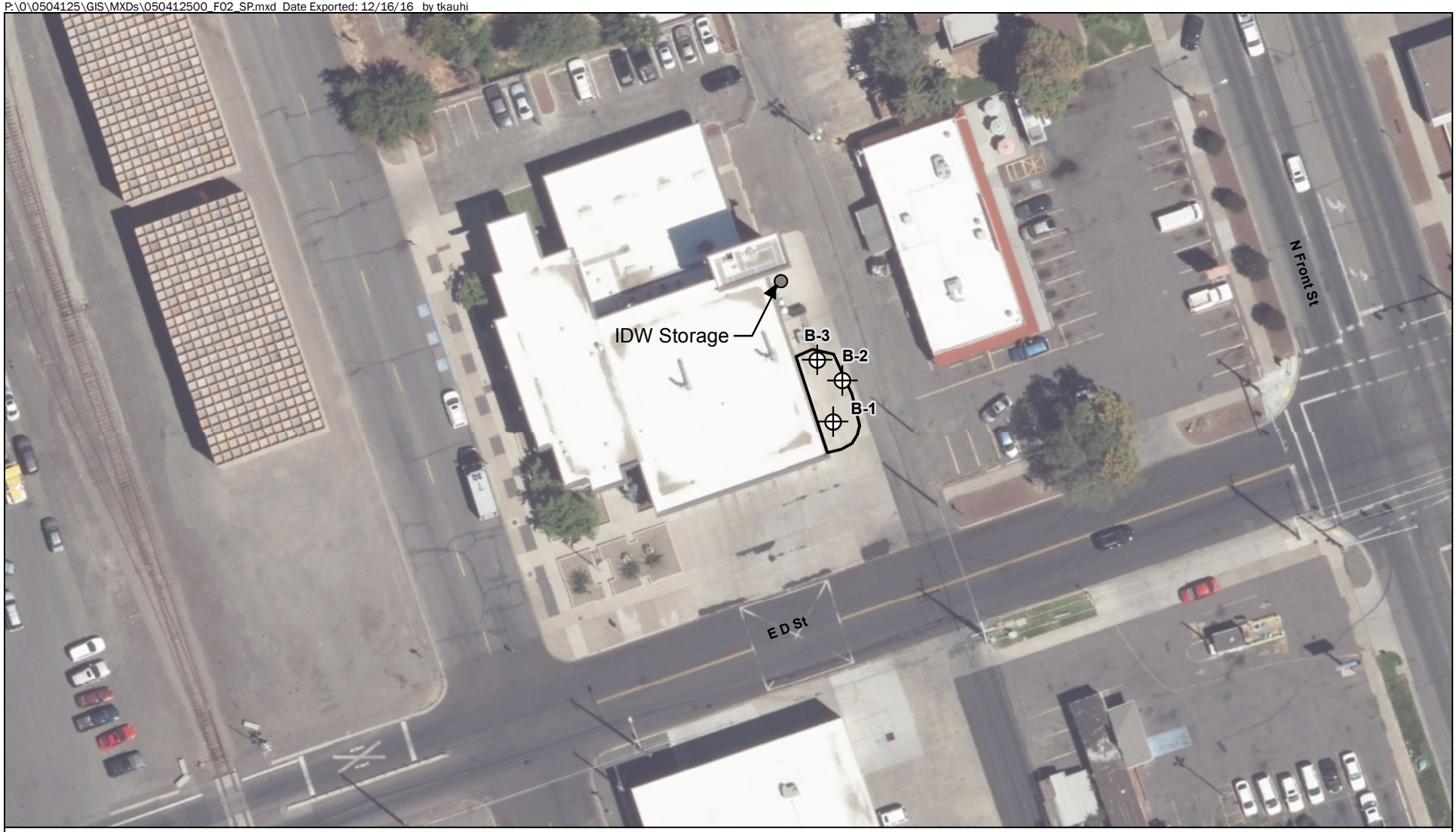
Figure 1

P:\0\0504125\GIS\MXDs\0504125000_F01_VM.mxd Date Exported: 10/21/16 by ccabrera

P:\0\0504125\GIS\MXDs\050412500_F02_SP.mxd Date Exported: 12/16/16 by tkauhi



Legend

- Investigation Derived Waste (IDW) Storage
- Former UST/Dispenser Approximate Location
- Boring Number and Approximate Location

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: Aerial image from ESRI Data Online.

Projection: NAD 1983 HARN StatePlane Washington North FIPS 4601 Feet

N W E S

60 0 60

Feet

Site Plan

Yakima City Fire Department
401 North Front Street
Yakima, Washington

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Figure 2

APPENDICES

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APPENDIX A
Field Procedures and Boring Logs

APPENDIX A
FIELD PROCEDURES AND BORING LOGS

General

Subsurface conditions at the Yakima City Fire Department site were explored on November 7 and 8, 2016, by advancing three air-rotary borings at the approximate locations shown on Figure 2. The borings were advanced between 15 and 16 feet below existing site grade using an air-rotary drill rig. Boring locations were established in the field using a site plan and measurements from onsite structures. Consequently, exploration locations should be considered accurate to the degree implied by the method used.

Field methods generally were performed in compliance with the project Master Work Plan assessment procedures.

Soil Sample Collection

Soil samples were removed from the SPT sampler using clean nitrile gloves, and transferred into a laboratory prepared container, labeled with a waterproof pen, and placed on wet ice in a clean plastic-lined cooler. The SPT sampler was decontaminated with liquinox soap and rinsed with deionized water between each sampling event.

Air rotary drilling operations were observed by GeoEngineers staff who examined and classified the soil encountered, obtained soil samples, and maintained a continuous exploration log. Soil encountered in the borings was classified in general accordance with ASTM International (ASTM) D 2488 and the classification chart listed in Key to Exploration Logs, Figure A-1. Boring logs are presented in Figures A-2 through A-4. The logs are based on field data interpretation and indicate the depth at which subsurface materials or their characteristics change, although these changes might actually be gradual.

Field Screening of Soil Samples

GeoEngineers' field representative performed field-screening tests on soil samples obtained from the borings. Field screening results were used as a general guideline to assess areas of possible petroleum-related contamination. The field screening methods used include: (1) PID screening; (2) visual screening; and (3) water-sheen screening.

PID screening involves placing soil in a container and after agitating or warming, measuring total volatile organic compounds in the available head space. Visual screening consists of observing soil for stains indicative of metal- or petroleum-related contamination. Water-sheen screening involved placing soil in a pan of water and observing the water surface for signs of sheen. Sheen screening may detect both volatile and nonvolatile petroleum hydrocarbons. Sheens observed are classified 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 may produce a slight sheen.
Moderate Sheen (MS)	Light to heavy sheen; may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on the water surface.

Heavy Sheen (HS)	Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Field screening results can be site specific. The effectiveness of field screening can vary with temperature, moisture content, organic content, soil type, and contaminant type and age.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

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

ADDITIONAL MATERIAL SYMBOLS

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

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

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.

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

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

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
PPM	Parts per million
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
NT	Not Tested

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.

KEY TO EXPLORATION LOGS

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FIGURE A-1

Rev. 02/16

Drilled Start 11/8/2016 End 11/8/2016	Total Depth (ft) 16.1	Logged By CMD Checked By SHL	Driller Environmental West Exploration, Inc.	Drilling Method Air Rotary
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment T-Schram
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured / Depth to Water (ft) / Elevation (ft)
Notes:				

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	0					CC	Approximately 2 inches of concrete cement			
						GP	Brown fine to medium gravel with trace silt and sand (loose, moist) (fill)			Pea gravel encountered at 3 feet according to driller
		6	18	B-1 (4-4.25)				NS	<1	
	5									
		1	25/1"			GP	Gray fine to coarse gravel with trace silt, sand, cobbles and boulders (medium dense, moist)			
	10									
		5	50/5"	B-1 (12-12.25) CA				NS	<1	
	15									
		1	25/1"			BOULDER	Encountered a boulder			

Note: See Figure A-1 for explanation of symbols.

Log of Boring B-1

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Project: Yakima City Fire Dept, 401 North Front Street
Project Location: Yakima, Washington
Project Number: 0504-125-00

Figure A-2
Sheet 1 of 1

Drilled	Start 11/7/2016	End 11/7/2016	Total Depth (ft)	15.7	Logged By / Checked By	CMD / SHL	Driller	Environmental West Exploration, Inc.	Drilling Method	Air Rotary
Surface Elevation (ft) Vertical Datum	Undetermined		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop			Drilling Equipment	T-Schram		
Easting (X) Northing (Y)			System Datum				Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)	
Notes:										

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample / Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	0					CC	Approximately 2 inches of concrete cement			
						GP	Gray fine to coarse gravel with trace silt, sand and cobbles (medium dense, moist)			
	5	3	47	B-2 (4.5-4.75)				NS	<1	
	10	4	50/3"	B-2 (9.5-9.75) CA				NS	<1	
		0	50/4"							No recovery
	15	4	50/2"							No recovery (gravel)

Note: See Figure A-1 for explanation of symbols.

Log of Boring B-2

GeoEngineers

Project: Yakima City Fire Dept, 401 North Front Street
Project Location: Yakima, Washington
Project Number: 0504-125-00

Figure A-3
Sheet 1 of 1

Drilled	Start 11/7/2016	End 11/7/2016	Total Depth (ft)	15.4	Logged By CMD / Checked By SHL	Driller	Drilling Method
						Environmental West Exploration, Inc.	Air Rotary

Surface Elevation (ft) / Vertical Datum	Undetermined	Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	T-Schram
Easting (X) / Northing (Y)		System Datum		Groundwater	Date Measured / Depth to Water (ft) / Elevation (ft)
Notes:					

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	0					CC	Concrete pavement			
						GP	Gray fine to coarse gravel with trace silt, sand and occasional cobbles (loose, moist)			
		5	50/5"	B-3 (4-4.25)				NS	<1	
	5									
		3	50/4"	B-3 (9.5-9.75) CA				NS	<1	
	10									
		1	50/4"							
	15	1	50/6"							

Note: See Figure A-1 for explanation of symbols.

Log of Boring B-3

GeoEngineers

Project: Yakima City Fire Dept, 401 North Front Street
Project Location: Yakima, Washington
Project Number: 0504-125-00

Figure A-4
Sheet 1 of 1

APPENDIX B
Chemical Analytical Laboratory Reports

APPENDIX B
CHEMICAL ANALYTICAL LABORATORY REPORTS

Samples

Chain-of-custody procedures were followed during the transport of the field samples to TestAmerica located in Spokane, Washington. The samples were held in cold storage pending extraction and/or analysis. The analytical results and quality control records are included in this appendix.

Analytical Data Review

The laboratory maintains an internal quality assurance/quality control (QA/QC) program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were included in the laboratory report dated November 14, 2016.

Analytical Data Review Summary

We reviewed the laboratory internal QA/QC in the context of data quality goals. Based on our review, in our opinion, the quality of the analytical data is acceptable for the intended use.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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

TestAmerica Job ID: 590-4960-1
Client Project/Site: Medical Facility/0504-122-00

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

Attn: Scott Lathen

Authorized for release by:
11/14/2016 11:50:26 AM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

Table of Contents

Case Narrative

Client: GeoEngineers Inc
Project/Site: Medical Facility/0504-122-00

TestAmerica Job ID: 590-4960-1

Job ID: 590-4960-1

Laboratory: TestAmerica Spokane

Narrative

Receipt
The samples were received on 11/9/2016 10:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.5º C.

GC Semi VOA
Method NWTPH-Dx: The continuing calibration verification (CCV) associated with batch 590-9552 recovered above the upper control limit for Residual Range Organics (RRO) (C25-C36). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: Site-8:B-1 (12-12.25) (590-4960-6) and (CCV 590-9552/15).

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.

Sample Summary

Client: GeoEngineers Inc
Project/Site: Medical Facility/0504-122-00

TestAmerica Job ID: 590-4960-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-4960-2	Site-8:B-3 (9.5-9.75)	Solid	11/07/16 15:15	11/09/16 10:25
590-4960-4	Site-8:B-2 (9.5-9.75)	Solid	11/07/16 16:35	11/09/16 10:25
590-4960-6	Site-8:B-1 (12-12.25)	Solid	11/08/16 08:30	11/09/16 10:25

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
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)

Client Sample ID: Site-8:B-3 (9.5-9.75)

Lab Sample ID: 590-4960-2
Date Collected: 11/07/16 15:15
Matrix: Solid
Date Received: 11/09/16 10:25
Percent Solids: 95.7

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	☼	11/10/16 09:22	11/10/16 14:17	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg	☼	11/10/16 09:22	11/10/16 14:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*92*		*50 - 150*	*11/10/16 09:22*	*11/10/16 14:17*	*1*
n-Triacontane-d62	*92*		*50 - 150*	*11/10/16 09:22*	*11/10/16 14:17*	*1*

Client Sample ID: Site-8:B-2 (9.5-9.75)

Lab Sample ID: 590-4960-4
Date Collected: 11/07/16 16:35
Matrix: Solid
Date Received: 11/09/16 10:25
Percent Solids: 96.5

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		9.8		mg/Kg	☼	11/10/16 09:22	11/10/16 14:35	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg	☼	11/10/16 09:22	11/10/16 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*90*		*50 - 150*	*11/10/16 09:22*	*11/10/16 14:35*	*1*
n-Triacontane-d62	*89*		*50 - 150*	*11/10/16 09:22*	*11/10/16 14:35*	*1*

Client Sample ID: Site-8:B-1 (12-12.25)

Lab Sample ID: 590-4960-6
Date Collected: 11/08/16 08:30
Matrix: Solid
Date Received: 11/09/16 10:25
Percent Solids: 96.3

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	☼	11/10/16 09:22	11/10/16 15:48	1
Residual Range Organics (RRO) (C25-C36)	ND		26		mg/Kg	☼	11/10/16 09:22	11/10/16 15:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*11/10/16 09:22*	*11/10/16 15:48*	*1*
n-Triacontane-d62	*95*		*50 - 150*	*11/10/16 09:22*	*11/10/16 15:48*	*1*

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

Lab Sample ID: MB 590-9547/1-A
Matrix: Solid
Analysis Batch: 9553

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 9547

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg		11/10/16 09:22	11/10/16 12:47	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg		11/10/16 09:22	11/10/16 12:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*104*		*50 - 150*	*11/10/16 09:22*	*11/10/16 12:47*	*1*
n-Triacontane-d62	*105*		*50 - 150*	*11/10/16 09:22*	*11/10/16 12:47*	*1*

Lab Sample ID: LCS 590-9547/2-A
Matrix: Solid
Analysis Batch: 9553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 9547

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics (DRO) (C10-C25)	67.1	62.4		mg/Kg		93	50 - 150
Residual Range Organics (RRO) (C25-C36)	66.8	66.3		mg/Kg		99	50 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*100*		*50 - 150*
n-Triacontane-d62	*103*		*50 - 150*

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: Medical Facility/0504-122-00

TestAmerica Job ID: 590-4960-1

Client Sample ID: Site-8:B-3 (9.5-9.75)
Date Collected: 11/07/16 15:15
Date Received: 11/09/16 10:25

Lab Sample ID: 590-4960-2
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			9550	11/10/16 09:25	EAF	TAL SPK

Client Sample ID: Site-8:B-3 (9.5-9.75)
Date Collected: 11/07/16 15:15
Date Received: 11/09/16 10:25

Lab Sample ID: 590-4960-2
Matrix: Solid
Percent Solids: 95.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.71 g	5 mL	9547	11/10/16 09:22	EAF	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			9552	11/10/16 14:17	NMI	TAL SPK

Client Sample ID: Site-8:B-2 (9.5-9.75)
Date Collected: 11/07/16 16:35
Date Received: 11/09/16 10:25

Lab Sample ID: 590-4960-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			9550	11/10/16 09:25	EAF	TAL SPK

Client Sample ID: Site-8:B-2 (9.5-9.75)
Date Collected: 11/07/16 16:35
Date Received: 11/09/16 10:25

Lab Sample ID: 590-4960-4
Matrix: Solid
Percent Solids: 96.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			15.82 g	5 mL	9547	11/10/16 09:22	EAF	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			9552	11/10/16 14:35	NMI	TAL SPK

Client Sample ID: Site-8:B-1 (12-12.25)
Date Collected: 11/08/16 08:30
Date Received: 11/09/16 10:25

Lab Sample ID: 590-4960-6
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			9550	11/10/16 09:25	EAF	TAL SPK

Client Sample ID: Site-8:B-1 (12-12.25)
Date Collected: 11/08/16 08:30
Date Received: 11/09/16 10:25

Lab Sample ID: 590-4960-6
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	3550C			15.18 g	5 mL	9547	11/10/16 09:22	EAF	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1			9552	11/10/16 15:48	NMI	TAL SPK

Laboratory References:

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

Certification Summary

Client: GeoEngineers Inc
Project/Site: Medical Facility/0504-122-00

TestAmerica Job ID: 590-4960-1

Laboratory: TestAmerica Spokane

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-071	10-31-17
Washington	State Program	10	C569	01-06-17

Method Summary

Client: GeoEngineers Inc
Project/Site: Medical Facility/0504-122-00

TestAmerica Job ID: 590-4960-1

Method	Method Description	Protocol	Laboratory
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

Laboratory References:

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

TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Callen Driscoll	Lab PM:	Carrier Tracking No(s):	COC No: 590-1986-723.1
Client Contact: Callan Driscoll / Scott Lathen	Phone: 406-498-2129	E-Mail:		Page: Page 1 of 2
Company: GeoEngineers Inc				Job #:
Address: 523 East Second Ave	Due Date Requested:			
City: Spokane	TAT Requested (days): 5 TD			
State, Zip: WA, 99202	PO #: 0504-125-00			
Phone:	WO #:			
Email: cdriscoll@geoengineers.com	Project #:			
Project Name: Medical Facility	SSOW#:			
Site:				

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH_Dx -	NWTPH_Dx -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	A		
Site-8: B-3 (4-4.25)	11/7/16	1500		Solid						
Site-8: B-3 (9.5-9.75)		1515		Solid			X			
Site-8: B-2 (4.5-4.75)		1620		Solid						
Site-8: B-2 (9.5-9.75)		1635		Solid			X			
Site-8: B-1 (4-4.25)	11/8/16	0805		Solid						
Site-8: B-1 (12-12.25)	11/8/16	0830		Solid			X			
				Solid						
				Solid						
				Solid						
				Solid						
				Solid						

590-4960 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	11/9/16 1025	GEI	Sheila Khady	11/9/16 1025	TA SPK
2						
3						

Custody Seals Intact: △ Yes △ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 5.5c IR003

11/14/2016

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Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-4960-1

Login Number: 4960
List Number: 1
Creator: Kratz, Sheila J

List Source: TestAmerica Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX C
Report Limitations and Guidelines for Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

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 Yakima City Fire Department site located at 401 North Front Street in Yakima, 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 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.

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[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

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.

Have we delivered World Class Client Service?

Please let us know by visiting **www.geoengineers.com/feedback**.

GeoEngineers