Groundwater Monitoring Report
August 2015

Former L&L Exxon
1315 Lee Boulevard
Richland, Washington

for
Washington State Department of Ecology

March 17, 2016

GeoEngineers
Earth Science + Technology

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File No. 0504-081-01

March 17, 2016

Prepared for:

Washington State Department of Ecology
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1.0 INTRODUCTION

This report presents results of the August 2015 groundwater monitoring event conducted at the former L&L Exxon site located at 1315 Lee Boulevard in Richland, Washington (herein referred to as "site"). Site soil and groundwater has been contaminated with petroleum hydrocarbons and other compounds resulting from historical site use as a service station. Groundwater monitoring generally has been conducted on a quarterly basis at the site since October 2012 to observe and document trends in groundwater conditions and quality; this event represents the Third Quarter 2015.

The site is located approximately as shown in the Vicinity Map, Figure 1. Locations of groundwater monitoring wells and groundwater elevations are presented in Site Plan and Groundwater Elevations, August 24, 2015, Figure 2. Site background information, including historical groundwater elevations, water quality parameters, and chemical analytical data, is included in Appendix A.

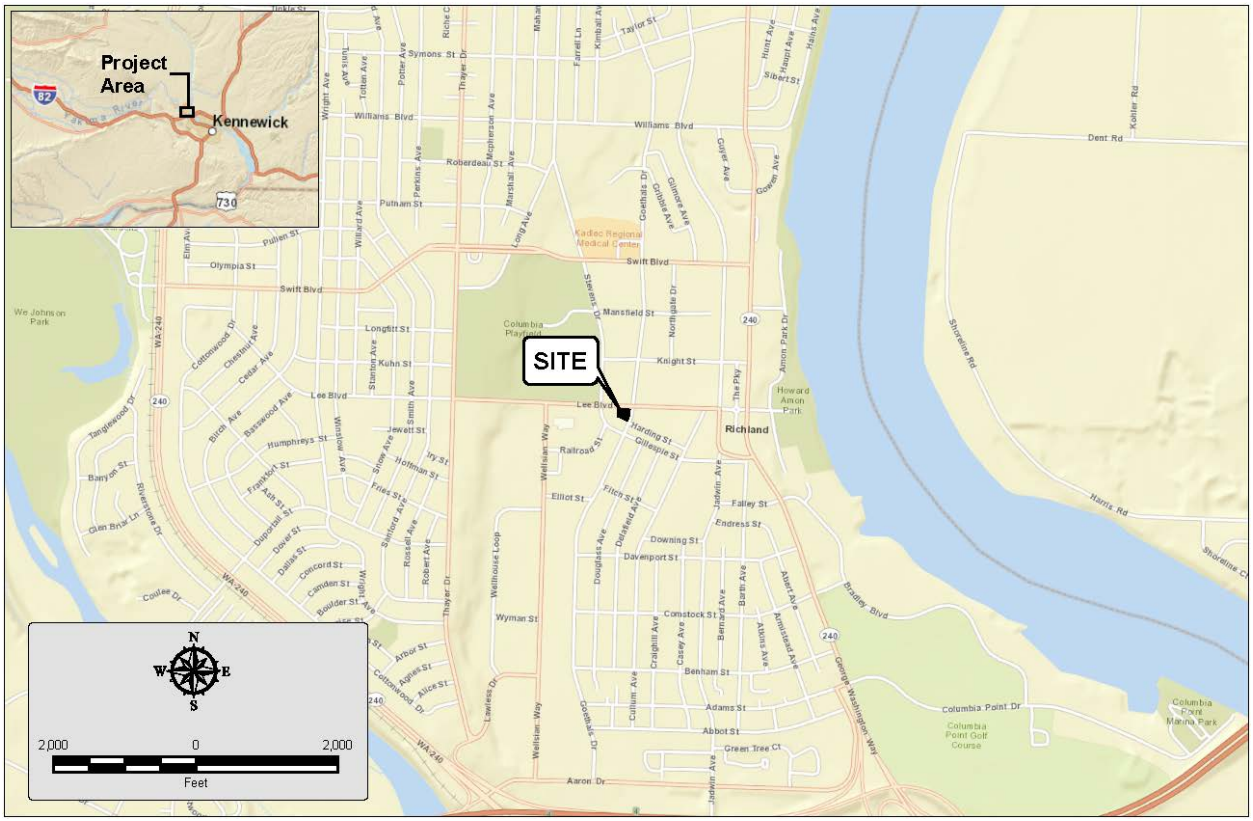

Figure 1: Vicinity Map

2.0 GROUNDWATER MONITORING PROGRAM

Quarterly groundwater monitoring activities generally include measuring the depth to groundwater in five site monitoring wells (MW-1 through MW-5), measuring water quality parameters, collecting samples from each well, submitting the samples to an analytical laboratory for chemical analysis, interpreting data and

trends based on field and laboratory findings, and preparing this report. The detailed scope of services and field procedures are included in Appendix A.

2.1. Groundwater Levels

Groundwater monitoring activities occurred on August 24, 2015. Depth to groundwater was measured in the five wells from the top of the polyvinyl chloride (PVC) well casings. Calculated groundwater elevations are summarized in Table 1 and posted on Figure 2.

TABLE 1: AUGUST 24, 2015 GROUNDWATER ELEVATIONS

Monitoring Well	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)	Elevation Change[1] (feet)
MW-1	360.47	15.50	344.97	-0.07
MW-2	360.42	14.90	345.52	-0.56
MW-3	360.38	14.88	345.50	-0.52
MW-4	359.92	14.47	345.45	-0.55
MW-5	360.02	14.60	345.42	-0.55

[1]Groundwater elevation change relative to the May 2015 groundwater sampling event.

During this event, groundwater elevations in the shallow unconfined aquifer at the site reflect a relatively flat groundwater gradient generally toward the east-southeast under a hydraulic gradient of approximately 0.0004 feet per foot (about 2 feet of vertical drop per linear mile). Previous groundwater gradients have indicated a general southeast to east flow direction. Regional shallow groundwater flow near the site is reported to be east-southeast toward the Columbia River.

Historical groundwater depths are presented in Summary of Groundwater Elevations, Table A-1. Measured groundwater elevations in site wells and interpreted flow directions and groundwater contours are graphically presented in Figure 2. Field methods are described in Appendix A.

The calculated groundwater elevation in MW-1 likely represents a field measurement error. The elevation change is not consistent with previous sampling events. Groundwater contours represented in Figure 2 were generated without the MW-1 groundwater elevation.

2.2. Groundwater Sampling

Groundwater samples were collected using low-flow, low-stress purge techniques from monitoring wells MW-1 through MW-5 on August 24, 2015, and submitted to TestAmerica Laboratories, Inc. (TestAmerica) in Spokane Valley, Washington. Samples were received within the appropriate hold times and the required temperature range. Groundwater samples were submitted for analysis of petroleum-related contaminants (gasoline-range petroleum hydrocarbons [GRPH], diesel-range petroleum hydrocarbons [DRPH], oil-range petroleum hydrocarbons [ORPH], benzene, toluene, ethylbenzene and total xylenes [BTEX] and total naphthalenes), chlorinated solvents (trichloroethylene [TCE] and tetrachloroethylene [PCE]), methane, and total organic carbon [TOC]. Sampling procedures are summarized in Appendix A.

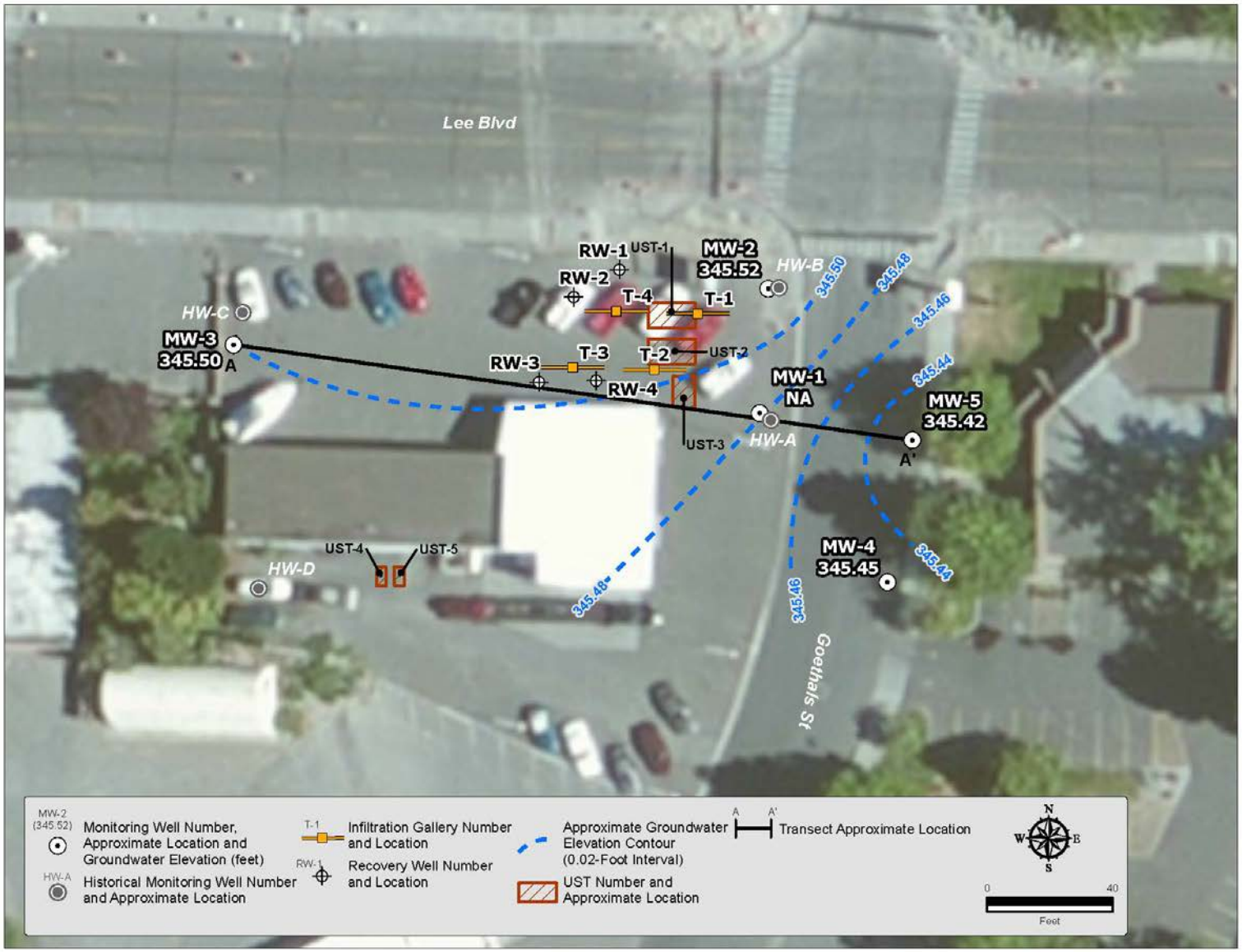

Figure 2. Site Plan and Groundwater Elevations, August 24, 2015

2.2.1. Chemical Analytical Results

GRPH, DRPH, BTEX and naphthalene concentrations exceeded Model Toxics Control Act (MTCA) Method A cleanup levels (CULs) in groundwater samples collected from monitoring wells MW-1, MW-2 and the duplicate sample (collected from MW-1). Both wells are located adjacent to and downgradient of the former site underground storage tanks (USTs) and fuel dispensers. Petroleum hydrocarbon-related contaminants were either not detected or detected at concentrations less than MTCA Method A CULs in monitoring wells MW-3 through MW-5. The August 2015 chemical analytical results are summarized below in Table 2.

PCE, migrating from a known upgradient/co-mingled source located about 450 feet northwest and generally upgradient of the site (New City Cleaners), was detected at concentrations greater than the MTCA Method A CUL from monitoring wells MW-3 and MW-5.

TABLE 2: AUGUST 24, 2015 CHEMICAL ANALYTICAL RESULTS

	MTCA Method A Cleanup Level	MW-1	MW-2	MW-3	MW-4	MW-5
GRPH (µg/L)	800/1,000	**15,000**	**55,000**	<100	<100	<100
DRPH (mg/L)	0.5	**4.6**	**3.9**	<0.23	<0.23	<0.23
ORPH (mg/L)	0.5	<0.39	<0.39	<0.39	<0.39	<0.39
Benzene (µg/L)	5	**490**	**1.8**	<0.20	<0.20	<0.20
Toluene (µg/L)	1,000	**880**	**9,000**	<1.0	<1.0	<1.0
Ethylbenzene (µg/L)	700	**740**	**2,300**	<1.0	<1.0	<1.0
m,p-Xylene (µg/L L)	1,000	**2,600**	**8,400**	<2.0	<2.0	<2.0
o-Xylene (µg/L)		**630**	**3,900**	<1.0	<1.0	<1.0
Hexane (µg/L)	480[1]	**9.6**	**17**	<1.0	<1.0	<1.0
Naphthalene (µg/L)	160	**240**	**320**	<0.085	<0.085	<0.085
1-Methylnaphthalene (µg/L)		**62**	**76**	<0.085	<0.085	<0.085
2-Methylnaphthalene (µg/L)		**87**	**120**	<0.085	<0.085	<0.085
TCE (µg/L)	5	<100	<100	<1.0	<1.0	<1.0
PCE (µg/L)	5	<100	<100	**8.7**	**1.8**	**5.9**

Notes:

Bold indicates the contaminant was detected at a concentration greater than the laboratory reporting limit or the reporting limit exceeded the MTCA Method A cleanup level.

Red boxes indicate the contaminant was detected at a concentration greater than the MTCA Method A cleanup level.

[1]MTCA Method B (non-carcinogen) cleanup level.

µg/L = micrograms per liter; mg/L = milligrams per liter

Compared to the May 2015 groundwater chemical analytical results, GRPH, DRPH and BTEX concentrations increased in samples collected from wells MW-1 and MW-2. PCE concentrations in samples collected from wells MW-3 and MW-5 were relatively unchanged compared to the May 2015 event.

Copies of original laboratory certificates are included in Appendix C. Groundwater monitoring chemical analytical results obtained beginning October 2012 are summarized in Table A-2.

2.2.2. Natural Attenuation Parameters

In addition to the petroleum-related contaminants of concern and the chlorinated solvents, groundwater samples were measured analyzed for natural attenuation parameters. Acidity/alkalinity (pH), specific conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), turbidity, temperature and soluble ferrous iron were measured in the field and the following natural attenuation parameters were analyzed by TestAmerica: soluble manganese; methane; and total organic carbon. The field-measured natural attenuation parameters reflect conditions at the conclusion of well purging and immediately before sample collection.

Field and laboratory analytical results for natural attenuation parameters are summarized in Table 3 and Table 4, respectively.

TABLE 3: FIELD MEASURED NATURAL ATTENUATION PARAMETERS

Monitoring Well	Field Measured Natural Attenuation Parameters						
	pH (pH units)	Specific Conductivity (µS/cm)	ORP (millivolts)	Dissolved Oxygen (mg/L)	Turbidity[1] (NTU)	Temperature (degrees C)	Soluble Ferrous Iron (mg/L)
MW-1	6.88	1,296	-49	0.06	46.33	22.19	1.75
MW-2	6.90	1,220	-223	0.13	5.864	21.74	1.75
MW-3	7.35	754.9	411	0.07	0.3918	20.00	<0.2
MW-4	7.12	1,400	243	0.40	2.539	21.23	<0.2
MW-5	7.48	837.1	337	0.09	0.9981	20.01	<0.2

Notes:

[1]Turbidity is not a natural attenuation parameter but was measured in the field to determine groundwater stabilization.

µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units

TABLE 4: LABORATORY ANALYZED NATURAL ATTENUATION PARAMETERS

Monitoring Well	Laboratory Analyzed Natural Attenuation Parameters (mg/L)		
	Manganese	Methane	Total Organic Carbon
MW-1	3.8	7.4	15
MW-2	3.8	5.5	13
MW-3	0.012	<0.0050	2.1
MW-4	0.43	0.029	2.3
MW-5	0.53	<0.0050	1.9

3.0 SUMMARY

The Third Quarter 2015 groundwater monitoring event at the L&L Exxon site in Richland, Washington was conducted on August 24, 2015. Groundwater elevations and water quality parameters were measured and

groundwater samples were collected from the five monitoring wells (MW-1 through MW-5) during this event. Groundwater elevation data indicated the gradient across the site is generally flat (the elevation difference is about 0.08 feet) and shallow groundwater flow is toward the east-southeast under a hydraulic gradient of approximately 0.0004 feet per foot. Regional groundwater flow is to the east-southeast, toward the Columbia River. The water level for MW-1 was not used for gradient information because the value is not consistent with the other monitoring wells or water levels in previous events possibly due to a measurement error.

GRPH, DRPH, benzene, ethylbenzene, total xylenes, total naphthalenes and/or toluene concentrations exceeding MTCA Method A cleanup criteria were detected in samples collected from monitoring wells MW-1, MW-2 and the duplicate sample collected from MW-1. GRPH, DRPH and BTEX concentrations in MW-1 and MW-2 tend to decrease with increasing groundwater elevations and increase with decreasing groundwater elevations based on trends from December 2013 through February 2015. GRPH, DRPH and BTEX concentrations in MW-1 and MW-2 increased with decreasing groundwater elevations during the August 2015 event.

PCE was detected at concentrations greater than the MTCA Method A cleanup criteria in the samples collected from MW-3 and MW-5. The detection limit for PCE was greater than MTCA Method A cleanup criteria in the samples collected from MW-1 and MW-2. Trends between groundwater elevations and PCE concentrations in MW-3 and MW-5 were not observed.

3.1. Natural Attenuation Processes

A qualitative assessment of the potential for biodegradation of contaminants was performed using geochemical parameters of groundwater samples collected from monitoring wells located within a source area (MW-1 and MW-2), and comparing those results with the results of similar analyses from groundwater samples collected from upgradient (MW-3) and downgradient wells (MW-4 and MW-5). Specifically, increased microbial activity tends to result in decreased ORP and DO concentrations in groundwater within source areas relative to upgradient and downgradient areas. Anaerobic microbial respiration also can cause a decrease in nitrate and sulfate concentrations, and an increase in dissolved manganese, ferrous iron and methane.

Select natural attenuation parameters were graphed for the August 2015 and previous (May 2015, February 2015, November 2014, August 2014, May 2014, February 2014 and December 2013) monitoring events. Results are presented in Natural Attenuation – ORP, Figure 3; Natural Attenuation – Dissolved Oxygen, Figure 4; Natural Attenuation – Dissolved Manganese, Figure 5; and Natural Attenuation – Ferrous Iron (Fe^{2+}), Figure 6. The x-axis of each graph represents the distance of cross section A-A' (depicted on Figure 2). Upgradient monitoring well MW-3 is located at the origin. Figures 3 through Figure 6 represent ORP, DO, dissolved manganese and ferrous iron, respectively. Based on review of the data and figures, we developed the following conclusions:

- Figures 3 through 6 document consistent trends with reduced ORP and DO levels and concentrations in the source area wells compared to the upgradient well. The ORP levels in source wells approach zero and in some cases are negative values suggesting anaerobic conditions. The DO levels in groundwater beneath the site are low, approaching zero in the source wells. In general, the levels and concentrations of these parameters increases in the downgradient wells although the rebound in DO typically does not reach the levels and concentrations observed in MW-3.

- Figures 5 and 6 indicate dissolved manganese and ferrous iron (Fe^{2+}) concentrations were greater near the source area than upgradient and downgradient areas for each monitoring event, suggesting manganese and ferrous iron are being used as electron acceptors in anaerobic respiration.

Observed natural attenuation parameters suggest that natural attenuation processes (and associated loss of contaminant mass) currently are ongoing near monitoring wells MW-1 and MW-2, with anaerobic conditions in the source area.

The next groundwater sampling event is scheduled for November 2015.

4.0 INFILTRATION GALLERY INSTALLATION

On July 7, 2015, Sandry Construction (Sandry) mobilized to the site to install four infiltration galleries. The infiltration galleries will be used to apply chemical oxidants and bioremediation amendments. Geoengineers was onsite during infiltration gallery installation to document construction activities and screen soils for contamination.

Sandry used a CAT 420E Backhoe to excavate the four infiltration gallery trenches to an approximate depth of 4 feet below ground surface. Sandry saw cut the asphalt of the asphalt patched area after infiltration gallery installation. The asphalt was left in place during installation to add stability to the excavations. Excavated soils were a fill material composed of brown silt with occasional fine to coarse gravels, cobbles and small boulders. Per the project specifications, Sandry was authorized to use clean excavated soils for backfill when field screening indicators of contamination were not observed.

Four infiltration galleries (T-1 through T-4) were installed in the locations displayed in Figure 2. Sandry constructed the infiltration galleries in accordance with the project plans and specifications. Infiltration galleries consisted of 2-inch-diameter 0.010-inch slotted 10-foot PVC sections placed approximately 3½ feet below ground surface with a riser pipe T-jointed from the connection of two screen sections. Sandry installed surface access to the infiltration gallery riser pipe with 8-inch flush mounted monuments and capped the pipes with removable compression caps.

Sandry encountered petroleum contamination in the southwest infiltration gallery (T-3) excavation. Excavated soils from the southwest excavation were hauled offsite to Waste Management's Columbia Ridge Landfill in Arlington, Oregon. Readings from photoionization detection (PID) ranged from 30 to 1950 parts per million (ppm) within the excavation. PID readings in the southwest infiltration gallery were the highest on the west side of the northern sidewall. GeoEngineers notified Ecology and the excavation was not extended to chase the contamination. GeoEngineers sampled the excavation sidewall near the highest PID readings and analyzed the sample for GRPH and BTEX. Results for the sidewall sample are listed in Table A-3. GRPH was detected at a concentration greater than the MTCA Method A cleanup criteria. BTEX was not detected greater than MTCA Method A cleanup criteria. Field screening indication of contamination was not observed in the other infiltration gallery excavations.

During excavation, Sandry damaged an unmarked electrical conduit feeding the property sign and an air supply line in the northeast infiltration gallery excavation. Allen Electric arrived onsite on July 8, 2015, and repaired the electrical conduit by adding a flush mounted junction box. Sandry capped the air supply line at the main building and disabled the electrical supply line at the property owner's request.

Sandry placed 1-inch-minus crushed rock wrapped in a non-woven geotextile fabric 6 inches below to 6 inches above the screened sections. Structural fill was placed, consisting of either trench spoils or imported 5/8-inch minus, in 1-foot loose lifts. Sandry compacted structural fill to at least 95 percent of the maximum dry density on the ASTM D 1557 laboratory procedure in accordance with the project plans and specifications. Sandry completed backfill in 1-foot lifts and compacted soils with a jumping jack between each lift. GN Northern conducted density testing in compacted areas and tests were at least 95 percent of the maximum dry density. GN Northern's soil density testing report is found in Appendix B.

Approximately 3,800 square feet of asphalt was patched on the property to improve the parking lot appearance. Asphalt patching was completed by Black Diamond Asphalt Paving on July 10, 2015. GN Northern conducted asphalt density testing and results were at least 92 percent of the Rice density. GN Northern's asphalt density testing report is found in Appendix B.

5.0 ISCO/BIOLOGICAL TREATMENT

On September 16, 2015, ETEC LLC (ETEC) began the injections of their in situ chemical oxidation (ISCO)/biological remediation products. Geoengineers was onsite during remediation product application to observe and document the injections. Prior to injections, groundwater measurements were recorded in site monitoring wells and site injection wells.

The remediation products were mixed onsite using two 160-gallon standing poly tanks and injected using ETEC's injection pump and injection lines. Up to seven sites were simultaneously used for injection during the process. Injections began on September 16, 2015 with ISCO injections consisting of approximately 900 gallons of low concentration (3 to 5 percent) hydrogen peroxide and approximately 300 gallons of a ferrous iron catalyst solution. The first half of the ISCO injections were injected into site injection wells RW-1 through RW-4 and infiltration gallery risers T-2 through T-4. The second half went into historic monitoring wells HW-A, HW-B, injection wells RW-3 and RW-4, and infiltration gallery risers T-1 through T-3.

Injection of the biological amendment began after completion of the ISCO injections and consisted of ETEC's TPH Bacterial Consortium (EZT-A2™), Enzyme Accelerator (EZT-EA™) and nutrients (CBN™). Biological amendments were divided into two parts. The first part, consisting of 500 pounds of CBN™, 5 gallons of EZT-EA™ and 5 gallons of EZT-A2™ was injected into site injection wells RW-1 through RW-4 and infiltration gallery risers T-2 through T-4 on September 16, 2015. The second part, consisting of 1,500 pounds of CBN™, 10 gallons of EZT-EA™ and 15 gallons of EZT-A2™ was injected into historic monitoring wells HW-A, HW-B, injection wells RW-3 and RW-4, and infiltration gallery risers T-1 through T-3 on September 17, 2015.

During ISCO/biological remediation product injections, product returns to surface were not observed. Water level readings recorded prior to injections, and then immediately after injections, indicate that product mounding occurred in injection wells RW-3 and RW-4.

6.0 LIMITATIONS

GeoEngineers has prepared this report for use by Ecology for the L&L Exxon site in Richland, Washington. Our services were conducted in general accordance with our proposal dated March 11, 2015, which was authorized with Work Assignment C11145EE, dated October 1, 2013.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of environmental monitoring in this area at the time this report was prepared. No warranty or other conditions express or implied should be understood. Report limitations and guidelines for use are included in Appendix C.

We appreciate the opportunity to provide these continued services to Ecology. Please call Scott Lathen or Bruce Williams at 509.363.3125 if you have questions regarding the contents of this report.

7.0 REFERENCES

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. 2008. "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June.

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

U.S. Environmental Protection Agency. Region 1. 2010. "Low Stress (Low-Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells," EPA SOP No. GW 0001, Revision No. 3.

FIGURES

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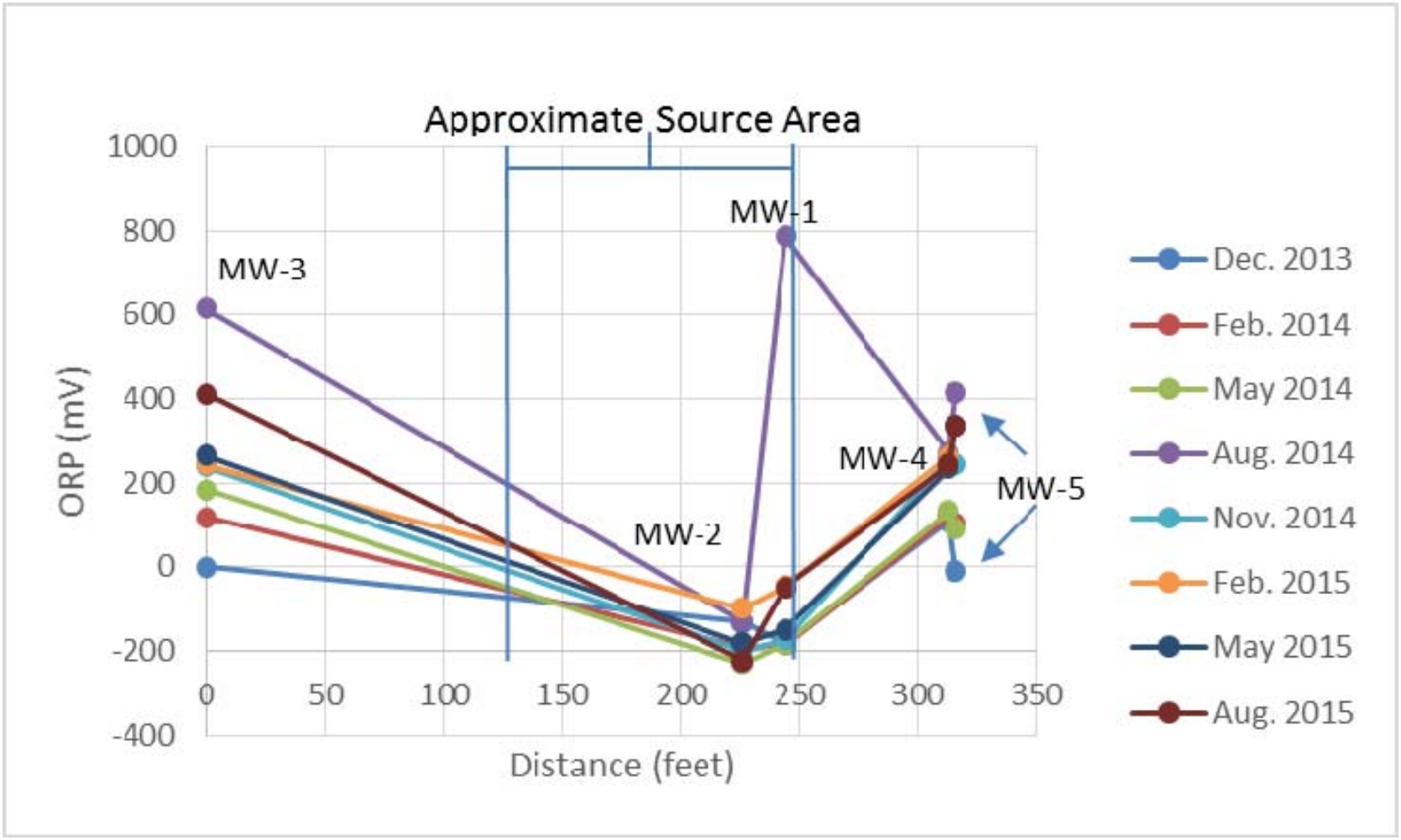

Note:

1. mV = millivolts

Natural Attenuation – ORP

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Figure 3

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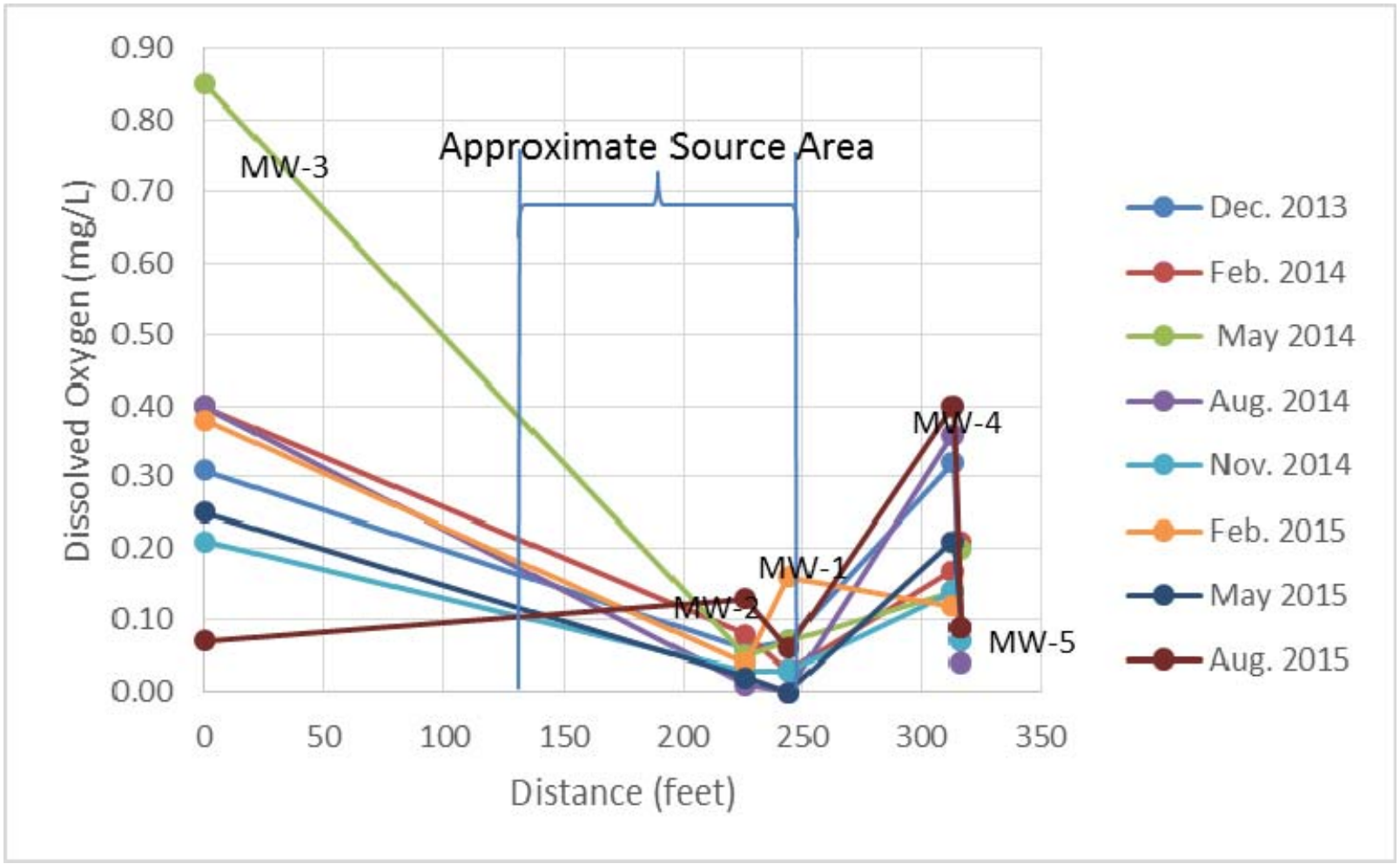

Natural Attenuation – Dissolved Oxygen

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Figure 4

Note:

1. mg/L = milligrams per liter

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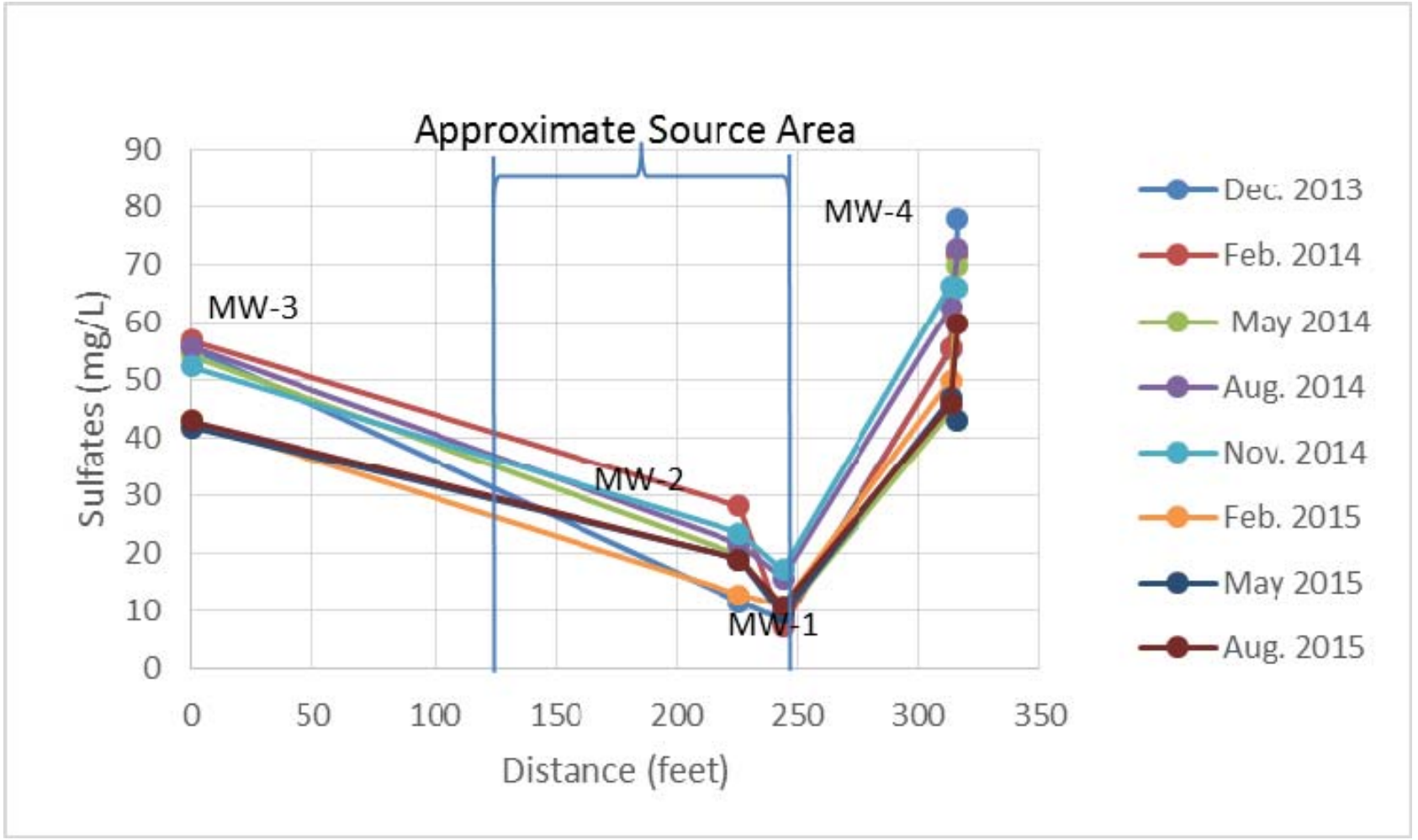

Note:

1. mV = millivolts

Natural Attenuation – Sulfates

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Figure 5

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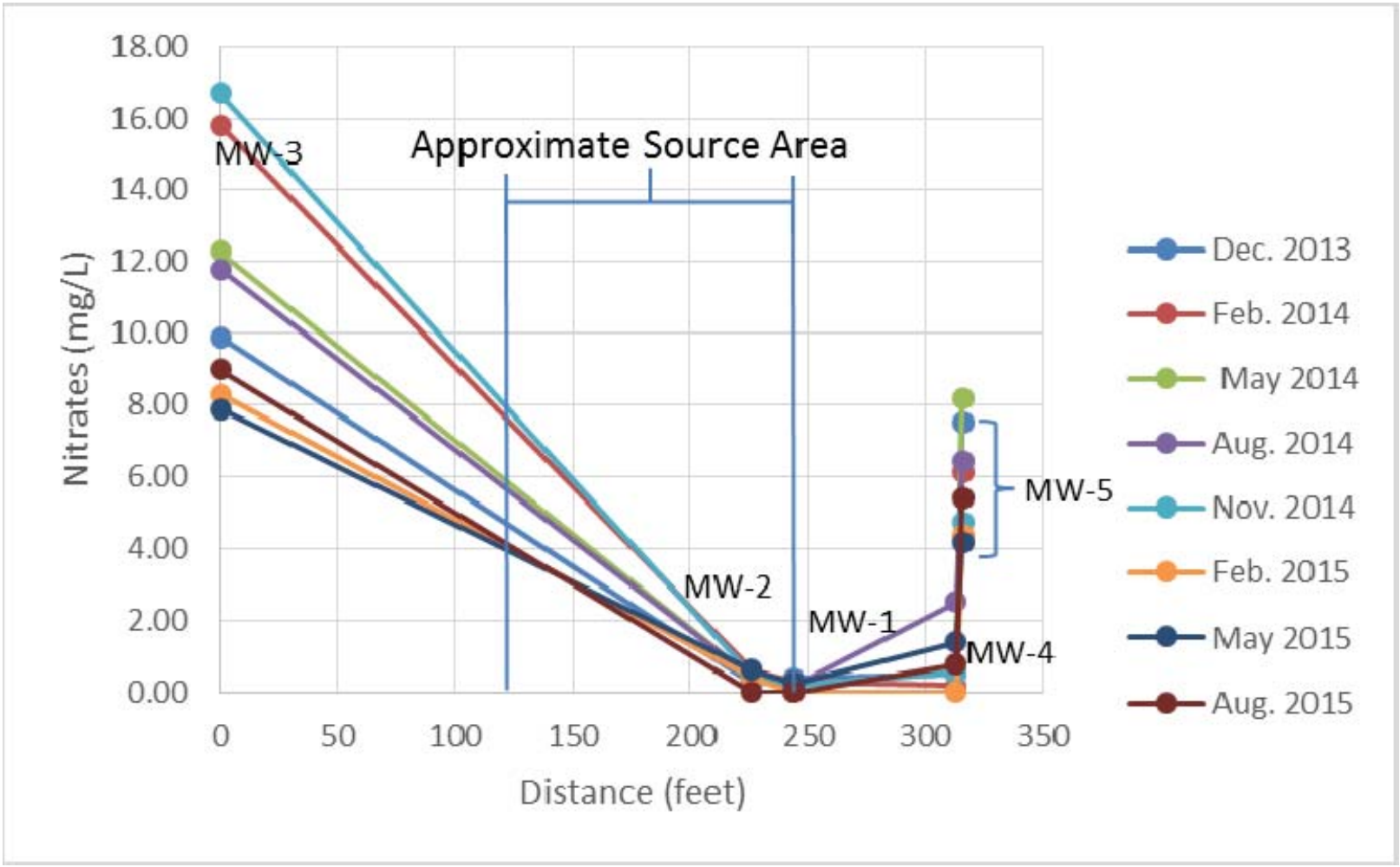

Natural Attenuation – Nitrates

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Figure 6

Note:

1. mV = millivolts

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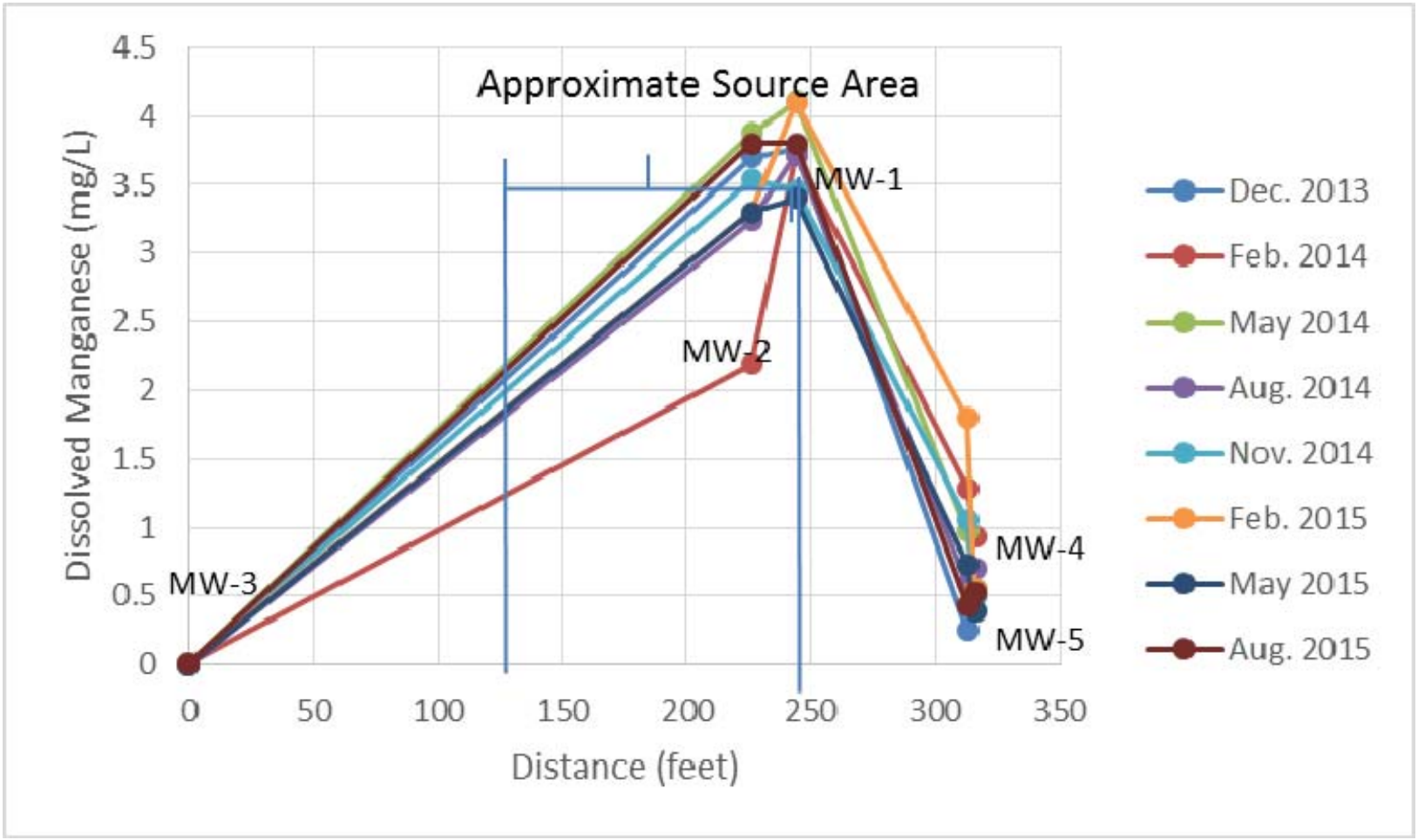

Natural Attenuation – Dissolved Manganese

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Figure 7

Note:

1. mg/L = milligrams per liter

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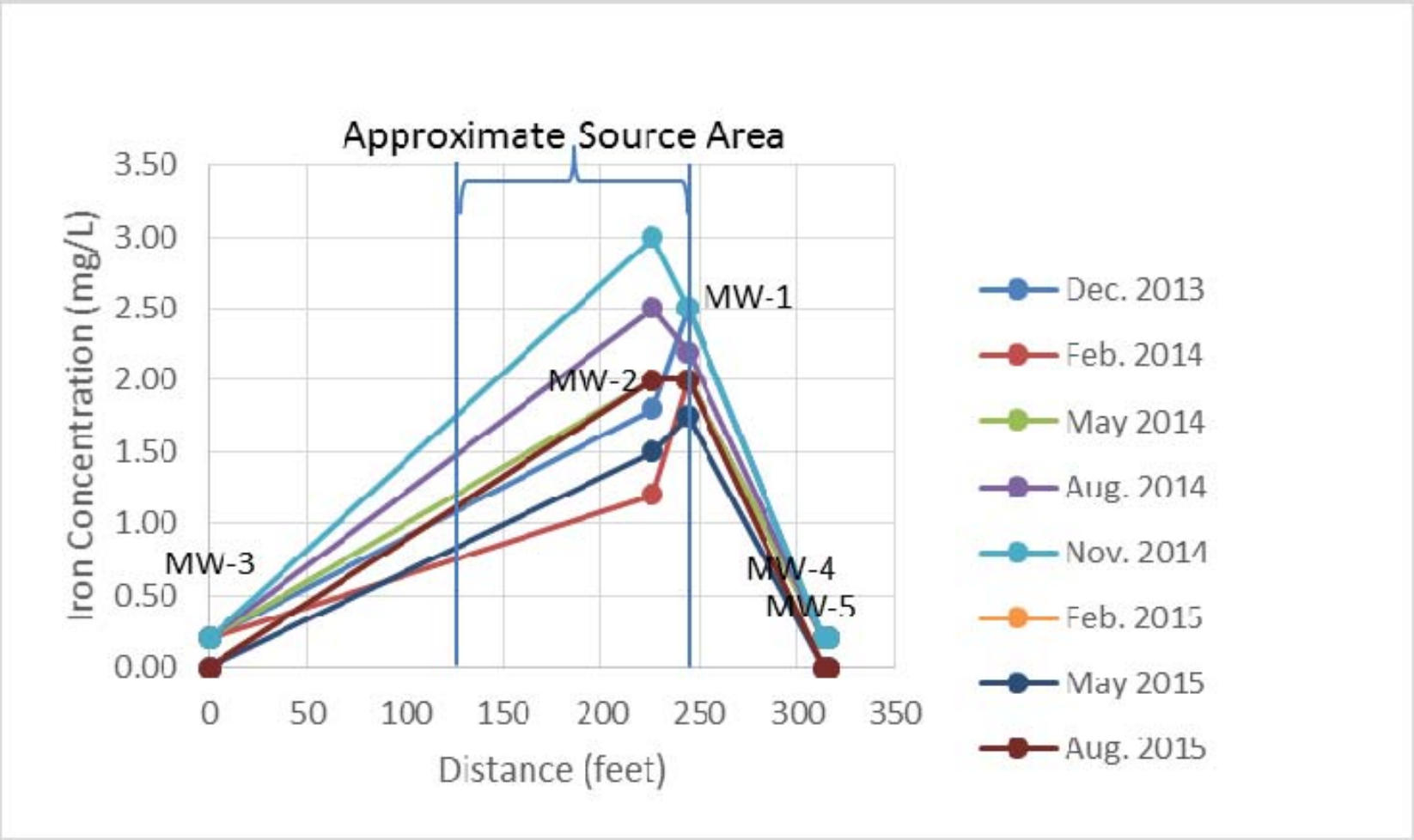

Note:

1. mg/L = milligrams per liter

Natural Attenuation – Ferrous Iron (Fe^{2+})

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Figure 8

File No. 0504-081-01

APPENDICES

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APPENDIX A
Site Background, Scope of Services and Field Methods

APPENDIX A
SITE BACKGROUND, SCOPE OF SERVICES AND FIELD METHODS

SITE DESCRIPTION

The site was the location of the former L&L Exxon service station, which closed in 1999. Former site features removed at closure included (depicted on Figure 2):

- Two 6,000-gallon gasoline USTs, designated as UST-1 and UST-2, respectively, installed in the late 1950s, located on the north side of the property;
- One 4,000-gallon gasoline UST (designated as UST-3), installed in 1979, located south of the 6,000-gallon USTs;
- Two 500-gallon USTs (waste oil and heating oil, designated as UST-4 and UST-5 respectively) located near the south side of the building; and
- Four fuel dispensers and associated subsurface piping, located on the north side of the property west of the USTs.

The site is located in a generally commercial area and currently operates as a used car dealership and maintenance shop. Four historical groundwater monitoring wells (HW-A through HW-D) are located at the site. However, these monitoring wells are in poor condition (including missing caps and caps paved with asphalt) or inaccessible (HW-D was located beneath a storage unit), and are not serviceable to collect groundwater samples. Three replacement monitoring wells (MW-1 through MW-3) were installed in 2012 to conduct groundwater sampling events. Supplemental assessment activities were conducted in April 2013; two additional downgradient monitoring wells (MW-4 and MW-5) were installed in Goethals Street located east of the property to further delineate the extent of groundwater contamination. Existing and historical site features, including former USTs and dispensers and current monitoring wells, are depicted on Figure 2.

SCOPE OF SERVICES

GeoEngineers' overall services for this task include groundwater monitoring and reporting. Our services were authorized under Work Assignment C11145EE, dated October 1, 2013. Our scope of services for this groundwater monitoring event included the following:

1. Measured the depth to groundwater five site groundwater monitoring wells (MW-1 through MW-5).
2. Collected groundwater samples from wells MW-1 through MW-5 using low-flow/low-stress sampling techniques. During well purging, water quality parameters (turbidity, pH, conductivity, temperature, DO and ORP) were monitored and recorded. A duplicate sample was collected from monitoring well MW-1.
3. Submitted groundwater samples to TestAmerica, located in Spokane Valley, Washington, for chemical analysis. Samples were analyzed for: GRPH using Northwest Method NWTPH-Gx; DRPH and ORPH using Northwest Method NWTPH-Dx; BTEX, n-hexane, TCE, and PCE using EPA Method 8260C; total organic carbon (TOC) using Method SM 2320B; and naphthalenes (naphthalene, 1-methylnaphthalene and 2-methylnaphthalene) using EPA Method 8270D. Natural attenuation parameters including soluble

manganese, methane and total organic carbon also were analyzed using applicable methods. Soluble ferrous iron concentrations were measured in the field.

4. Compared laboratory groundwater analytical results with applicable project cleanup criteria.
5. Calculated groundwater elevations within site monitoring wells and groundwater flow direction. Estimated the range in hydraulic gradient across the site.
6. Coordinated investigation-derived waste (IDW) characterization and future disposal.
7. Prepared draft and final Quarterly Groundwater Monitoring Reports.
8. Laboratory analytical results will be entered into Ecology's Environmental Information Management (EIM) database.

Groundwater Elevations

Depths to groundwater were measured relative to the north side of the monitoring well casing rims using an electric water-level indicator. The probe of the water-level indicator was decontaminated between wells with a detergent wash, followed by two distilled water rinses. Groundwater elevations were calculated by subtracting the depth to groundwater from the casing rim elevations.

Low-Flow Sampling Procedures

Groundwater sampling was performed consistent with the EPA's low-flow groundwater sampling procedure, as described by EPA (2010) and Puls and Barcelona (1996). Monitoring wells were purged using a peristaltic pump equipped with disposable tubing. During purging activities, water quality parameters, including pH, conductivity, temperature, turbidity, ORP and DO, were measured using a Troll 9500 multi-parameter meter equipped with a flow-through cell; measurements were recorded approximately every 3 minutes. The meter calibration was verified at the beginning of each work day consistent with manufacturer recommendations prior to purging and sampling activities.

Soluble ferrous iron (Fe^{2+}), which has a 15-minute hold time, was measured in the field using a Hach IR-18C color disc test kit and the 1,10 phenanthroline testing method. Field measurement results are provided in Table A-1. Reported field parameters reflect conditions at the conclusion of well purging during low-flow sampling.

Groundwater samples were collected after (1) water quality parameters had stabilized or (2) a maximum purge time of at least 30 minutes was achieved. During purging and sampling, the purge rate was not allowed to exceed 500 milliliters per minute. Water quality parameter stabilization criteria include the following:

- Turbidity: ±10 percent for values greater than 5 NTU;
- DO: ±10 percent for values greater than 0.5 mg/L;
- Conductivity: ±3 percent;
- pH: ±0.1 unit;
- Temperature: ±3 percent; and
- ORP: ±10 mV.

After groundwater quality stabilization criteria were reached, the pump's discharge tubing was disconnected from the flow-through cell and groundwater samples were collected for analysis.

Each sample was pumped directly into sample containers supplied by the laboratory. All groundwater samples collected for chemical analysis were kept cool during on-site storage and transport to the laboratory. Chain-of-custody procedures were observed during transport of the groundwater samples.

Table A-1

Summary of Groundwater Elevations and Natural Attenuation Parameters

Former L&L Exxon, 1315 Lee Boulevard

Richland, Washington

Well Number and Top of Casing Elevation[1] (feet)	Date Measured	Purge Duration (minutes)	Depth to Water (feet)	Groundwater Elevation[1] (feet)	pH (pH units)	Specific Conductivity (µS/cm)	Redox Potential (millivolts)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Temperature (degrees C)	Soluble Ferrous Iron[2] (mg/L)
MW-1	10/19/12	24	17.67	342.80	7.10	1096	-91	0.07	9.15	20.18	NM
360.47	01/17/13	21	18.16	342.31	6.78	1206	-129	0.03	0.32	18.00	NM
	04/01/13	18	16.08	344.39	7.05	1400	-78.8	-0.04	NA	18.98	NM
	06/03/13	28	15.70	344.77	7.16	1072	-179	0.03	0.3728	18.50	NM
	12/16/13	39	15.60	344.87	7.09	1756	-181	0.07	5.376	19.46	2.5
	02/13/14	15	15.95	344.52	6.91	1261	-186	0.03	0.7333	18.31	2.0
	05/29/14	12	15.70	344.77	6.90	1338	-184	0.07	0.8673	19.15	2.0
	08/26/14	21	14.95	345.52	6.93	1276	787	0.00	2.7570	20.27	2.2
	11/25/14	21	15.20	345.27	6.90	1077	-174	0.03	3.698	20.01	2.5
	02/19/15	15	15.35	345.12	6.94	1163	-47	0.16	1.964	18.48	2.0
	05/11/15	18	15.57	344.90	7.14	1000	-149	0.00	1.951	18.99	1.8
	08/24/15	30	15.50	344.97	6.88	1296	-49	0.06	46.33	22.19	1.75
MW-2	10/19/12	20	17.53	342.89	7.06	1295	-72	0.06	6.17	20.02	NM
360.42	01/17/13	20	18.02	342.40	6.73	1216	-166	0.03	0.76	17.75	NM
	04/01/13	60	15.95	344.47	7.12	1200	-24	-0.03	NA	19.06	NM
	06/03/13	24	15.54	344.88	7.07	1059	-257	0.02	2.871	18.41	NM
	12/16/13	12	15.46	344.96	6.79	1239	-131	0.06	4.081	18.95	1.8
	02/13/14	27	15.82	344.60	7.09	895.7	-191	0.08	1.923	18.13	1.2
	05/29/14	24	15.54	344.88	6.97	1269	-229	0.05	6.273	19.1	2.0
	08/26/14	21	14.80	345.62	7.00	1052	-131	0.01	3.099	20.66	2.5
	11/25/14	30	15.06	345.36	6.92	1093	-199	0.03	1.540	19.92	3.0
	02/19/15	15	15.21	345.21	6.96	1021	-98	0.04	1.835	18.41	2.0
	05/11/15	15	15.46	344.96	7.15	1015	-181	0.02	3.915	18.81	1.5
	08/24/15	15	14.90	345.52	6.90	1220	-223	0.13	5.864	21.74	1.75
MW-3	10/19/12	9	17.52	342.86	7.24	853	133	4.96	2.69	18.75	NM
360.38	01/17/13	15	17.95	342.43	6.77	859	128	0.79	0.42	17.41	NM
	04/01/13	42	15.89	344.49	7.43	800	40.2	0.14	NA	18.79	NM
	06/03/13	24	15.51	344.87	7.34	742.9	360	0.33	0.6254	18.18	NM
	12/16/13	25	15.38	345.00	7.26	786.3	0	0.31	0.8251	18.29	< 0.2
	02/13/14	21	15.70	344.68	7.27	819.5	119	0.40	0	17.24	< 0.2

Well Number and Top of Casing Elevation[1] (feet)	Date Measured	Purge Duration (minutes)	Depth to Water (feet)	Groundwater Elevation[1] (feet)	pH (pH units)	Specific Conductivity (µS/cm)	Redox Potential (millivolts)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Temperature (degrees C)	Soluble Ferrous Iron[2] (mg/L)
MW-3 (cont.)	05/29/14	31	15.51	344.87	7.37	827.3	183	0.85	0	19.80	< 0.2
	08/26/14	30	14.81	345.57	7.37	791.9	616	0.40	157.5	19.34	< 0.2
	11/25/14	18	14.95	345.43	7.30	819.3	238	0.21	3.010	18.72	<0.2
	02/19/15	15	15.10	345.28	7.33	735.9	244	0.38	1.177	17.56	<0.2
	05/11/15	15	15.40	344.98	7.34	738.1	264	0.25	10.65	18.60	<0.2
	08/24/15	15	14.88	345.50	7.35	754.9	411	0.07	0.3918	20.00	<0.2
MW-4	05/06/13	59	15.55	344.83	7.48	952.4	387	0.65	0.0581	17.66	NM
359.92	06/03/13	15	15.16	344.76	7.42	979.2	396	0.64	-0.3368	19.54	NM
	12/16/13	32	15.08	344.84	7.39	1503	110	0.32	1.225	19.21	< 0.2
	02/13/14	27	15.42	344.50	7.19	1119	120	0.17	0	18.81	< 0.2
	05/29/14	25	15.17	344.75	7.31	1071	134	0.14	1	19.03	< 0.2
	08/26/14	39	14.38	345.54	7.28	1007	272	0.36	14.74	20.12	< 0.2
	11/25/14	15	14.65	345.27	7.21	1058	261	0.14	1.351	20.00	<0.2
	02/19/15	15	14.84	345.08	7.23	1065	262	0.12	1.561	17.12	<0.2
	05/11/15	15	15.02	344.90	7.07	1800	235	0.21	1.789	18.12	<0.2
	08/24/15	18	14.47	345.45	7.12	1400	243	0.40	2.539	21.23	<0.2
MW-5	05/06/13	59	15.63	344.39	7.51	890.4	401	6.27	1.410	17.66	NM
360.02	06/03/13	15	15.24	344.78	7.41	920.3	428	0.52	3.996	19.36	NM
	12/16/13	36	15.16	344.86	7.36	804.6	-11	0.07	1.226	19.51	< 0.2
	02/13/14	21	15.52	344.50	7.42	870.6	106	0.21	0.9834	17.67	< 0.2
	05/29/14	28	15.26	344.76	7.49	893.9	90	0.20	5.8430	20.32	< 0.2
	08/26/14	18	14.48	345.54	7.49	818.2	413	0.04	2.710	19.35	< 0.2
	11/25/14	15	14.76	345.26	7.41	826.7	242	0.07	4.081	19.20	<0.2
	02/19/15	18	14.93	345.09	7.47	816.5	261	0.08	3.298	17.64	<0.2
	05/11/15	15	15.15	344.87	7.38	825.3	184	0.01	1.674	17.98	<0.2
	08/24/15	18	14.60	345.42	7.48	837.1	337	0.09	0.9981	20.01	<0.2

Notes:

[1]Survey completed by Coffman Engineers on November 25, 2014.

[2]Soluble ferrous iron concentrations are measured in the field using a Hach IR-18C color disc test kit and the 1,10 phenanthroline testing method.

MW-1 water level on 8/24/2015 is not consistent with other wells or previous events possibly due to an error in measurement.

Groundwater elevations were calculated through use of the following formula: Groundwater Elevation = Top of Casing Elevation - Depth to Water.

Dissolved oxygen, oxidation-reduction potential, specific conductivity, pH and temperature measurements in this table were recorded at the conclusion of well purging.

NTU = nephelometric turbidity units; mg/L = milligrams per liter; µS/cm = microSiemens per centimeter; NM = not measured

Table A-2

Summary of Chemical Analytical Results - Groundwater[1]

Former L&L Exxon, 1315 Lee Boulevard
Richland, Washington

Monitoring Well ID	Date Sampled	Petroleum-Range Hydrocarbons			Volatile Organic Compounds[4] (µg/L)								Naphthalenes[7] (µg/L)			Natural Attenuation Parameters (mg/L)					
		GRPH[2] (µg/L)	DRPH[3] (mg/L)	ORPH[3] (mg/L)	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Hexane	TCE[5]	PCE[6]	Naphthalene	1-Methyl-naphthalene	2- Methyl-naphthalene	Manganese[8]	Methane[9]	Nitrate-Nitrogen[10]	Sulfate[10]	Total Alkalinity[11]	Total Organic Carbon[12]
MTCA CUL[13]		**800/1,000[14]**	**0.5**	**0.5**	**5**	**1,000**	**700**	**1,000[15]**		**480[16]**	**5**	**5**	**160[17]**			**2.2[8]**	**--**	**10[10]**	**250[10]**	**NE**	**NE**
MW-1	10/19/12	**3,740**	**2.40**	<0.299	**178**	**100**	**16.5**	**334**	**139**	**4.53**	NA	NA	**110**	**30.0**	**38.0**	NA	NA	NA	NA	NA	NA
	01/17/13	**8,080**	**2.92**	<0.380	**628**	**675**	**581**	**1,290**	**365**	<1.00	NA	NA	**87.4**	**19.4**	**18.4**	NA	NA	NA	NA	NA	NA
	04/01/13	**35,400**	**10.7**	<0.251	**1,620**	**1,330**	**1,440**	**4,930**	**1,220**	<20	NA	NA	**498**	**93.3**	**133**	NA	NA	NA	NA	NA	NA
	06/03/13	**51,000**	**2.09**	<0.379	<20.0[18]	**7,120**	**1,320**	**4,180**	**1,980**	<100	NA	NA	**73.3**	**15.9**	**18.1**	NA	NA	NA	NA	NA	NA
	12/16/13	**27,200**	**6.91**	<0.390	**1,010**	**990**	**1,240**	**4,710**	**1,040**	<100	NA	NA	**335**	**61.3**	**94.8**	**3.76**	**2.01**	**0.400**	**8.48**	**625**	NA
	02/13/14	**25,000**	**8.47**	<0.389	**925**	**833**	**1,000**	**4,520**	**875**	<100	<100[18]	<100[18]	**308**	**60.4**	**91.6**	**3.72**	**5.86**	**0.300**	**7.42**	**625**	NA
	05/29/14	**21,100**	**8.21**	<0.386	**738**	**971**	**903**	**3,810**	**752**	<100	<100[18]	<100[18]	**266**	**45.3**	**72.1**	**4.11**	**3.78**	**0.200**	**9.56**	**570**	NA
	08/26/14	**13,800**	**6.3**	<0.390	**488**	**592**	**751**	**2,280**	**759**	<100	<100[18]	<100[18]	**373**	**87.5**	**119**	**3.72**	**4.66**	<0.200	**15.9**	**570**	NA
	11/25/14	**16,300**	**5.84**	<0.395	**652**	**593**	**914**	**3,080**	**689**	<10.0	<10.0[18]	<10.0[18]	**210**	**58.6**	**81.7**	**3.46**	**3.38**	<0.200	**17.3**	**475**	**12.0**
	02/19/15	**20,000**	**7.8**	<0.39	**630**	**620**	**1,000**	**3,700**	**660**	<100	<100[18]	<100[18]	**290**	**60**	**85**	**4.1**	**1.0**	<0.20	**11**	**670**	**15**
	05/11/15	**10,000**	**2.5**	<0.39	**300**	**290**	**470**	**1,600**	**190**	<100	<100[18]	<100[18]	**290**	**60**	**82**	**3.4**	**7.3**	**0.27**	**9.5**	**430**	**8**
	08/24/15	**15,000**	**4.6**	<0.39	**490**	**880**	**740**	**2,600**	**630**	9.6	<1.0	<1.0	**240**	**62**	**87**	**3.8**	**7.4**	<0.20	**11**	**580**	**15**
MW-2	10/19/12	**19,500**	**2.32**	<0.305	**0.990**	**2,400**	**834**	**2,720**	**982**	**6.66**	NA	NA	**170**	**37.0**	**49.0**	NA	NA	NA	NA	NA	NA
	01/17/13	**98,400**	**3.35**	<0.381	**3.23**	**9,560**	**1,530**	**5,060**	**2,060**	**21.8**	NA	NA	**236**	**46.9**	**72.6**	NA	NA	NA	NA	NA	NA
	04/01/13	**50,600**	**1.27**	<0.305	<20.0[18]	**7,710**	**1,550**	**4,630**	**2,180**	<100	NA	NA	**300**	**55.8**	**84.9**	NA	NA	NA	NA	NA	NA
	06/03/13	**10,200**	**2.91**	<0.382	**300**	**159**	**316**	**985**	**186**	<100	NA	NA	**292**	**58.2**	**87.5**	NA	NA	NA	NA	NA	NA
	12/16/13	**95,300**	**3.87**	<0.398	<20.0[18]	**15,700**	**2,750**	**9,360**	**4,120**	<100	NA	NA	**421**	**71.0**	**127**	**3.70**	**3.02**	**0.260**	**11.6**	**460**	NA
	02/13/14	**44,100**	**3.03**	<0.392	<40.0[18]	**8,050**	**1,570**	**5,690**	**2,390**	<200	<200[18]	<200[18]	**246**	**47.0**	**83.6**	**2.19**	**3.75**	**0.610**	**28.3**	**335**	NA
	05/29/14	**60,100**	**6.72**	<0.390	<40.0[18]	**13,900**	**2,430**	**8,360**	**3,690**	<200	<200[18]	<200[18]	**315**	**61.8**	**104**	**3.88**	**2.61**	**0.430**	**19.9**	**490**	NA
	08/26/14	**48,700**	**3.00**	<0.390	<40.0[18]	**11,600**	**1,910**	**6,870**	**3,160**	<200	<200[18]	<200[18]	**354**	**72.9**	**110**	**3.24**	**1.21**	**0.420**	**21.6**	**485**	NA
	11/25/14	**52,900**	**3.96**	<0.389	<20.0[18]	**7,750**	**2,070**	**7,210**	**3,410**	<100	<100[18]	<100[18]	**308**	**77.5**	**120**	**3.54**	**2.09**	**0.440**	**23.6**	**475**	**8.24**
	02/19/15	**110,000**	**4.50**	<0.38	<200[18]	**7,800**	**2,400**	**9,000**	**3,900**	<1,000[18]	<1,000[18]	<1,000[18]	**340**	**72.0**	**110**	**3.30**	**1.00**	**0.43**	**13**	**420**	**7.60**
	05/11/15	**39,000**	**2.4**	<0.39	<20.0[18]	**4,700**	**1,900**	**6,400**	**3,000**	<100	<100[18]	<100[18]	**340**	**69**	**110**	**3.3**	**4.0**	**0.62**	**19**	**400**	**7.1**
	08/24/15	**55,000**	**3.9**	<0.39	**1.8**	**9,000**	**2,300**	**8,400**	**3,900**	**17**	<1.0	<1.0	**320**	**76**	**120**	**3.8**	**5.5**	<0.20	**19**	**440**	**13**

Monitoring Well ID	Date Sampled	Petroleum-Range Hydrocarbons			Volatile Organic Compounds[4] (µg/L)								Naphthalenes[7] (µg/L)			Natural Attenuation Parameters (mg/L)					
		GRPH[2] (µg/L)	DRPH[3] (mg/L)	ORPH[3] (mg/L)	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Hexane	TCE[5]	PCE[6]	Naphthalene	1-Methyl-naphthalene	2- Methyl-naphthalene	Manganese[8]	Methane[9]	Nitrate-Nitrogen[10]	Sulfate[10]	Total Alkalinity[11]	Total Organic Carbon[12]
MTCA CUL[13]		**800/1,000[14]**	**0.5**	**0.5**	**5**	**1,000**	**700**	**1,000[15]**		**480[16]**	**5**	**5**	**160[17]**			**2.2[8]**	**--**	**10[10]**	**250[10]**	**NE**	**NE**
MW-3	10/19/12	<90.0	<0.149	<0.298	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	**0.160**	<0.0095	<0.012	NA	NA	NA	NA	NA	NA
	01/17/13	<90.0	<0.237	<0.379	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	<0.0951	<0.0951	<0.0951	NA	NA	NA	NA	NA	NA
	04/01/13	<90.0	<0.187	<0.299	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	<0.262	<0.262	<0.262	NA	NA	NA	NA	NA	NA
	06/03/13	<90.0	<0.237	<0.380	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	**0.970**	**9.25**	<0.190	<0.190	<0.190	NA	NA	NA	NA	NA	NA
	12/16/13	<90.0	<0.437	<0.455	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	**0.179**	<0.0996	<0.0996	**0.0105**	**0.0333**	**9.90**	**55.7**	**285**	NA
	02/13/14	<100	<0.233	<0.389	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**12.2**	<0.0950	<0.0950	<0.0950	**0.0112**	<0.00500	**15.8**	**57.0**	**325**	NA
	05/29/14	<100	<0.237	<0.394	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**10.8**	**0.128**	<0.0986	<0.0986	**0.0148**	<0.00500	**12.3**	**54.3**	**295**	NA
	08/26/14	<100	<0.231	<0.385	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**11.2**	**0.104**	<0.0950	<0.0950	<0.0100	<0.00500	**11.8**	**55.8**	**320**	NA
	11/25/14	<100	<0.231	<0.386	<0.200	<1.00	<1.00	<2.00	<1.00	<100	<1.00	**11.5**	<0.0214	<0.0214	**0.0335**	**0.0117**	**0.0221**	**16.7**	**52.5**	**770**	**1.83**
	02/19/15	<100	<0.23	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	**8.9**	**0.150**	<0.085	<0.085	**0.011**	**0.0096**	**8.3**	**43.0**	**320**	**1.8**
	05/11/15	<100	<0.23	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	**8.2**	<0.085	<0.085	<0.085	<0.010	<0.0050	**7.9**	**42**	**290**	**1.7**
	08/24/15	<100	<0.23	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	**8.7**	<0.085	<0.085	<0.085	**0.012**	<0.0050	**9.0**	**43**	**280**	**2.1**
MW-4	05/06/13	<90.0	<0.238	<0.382	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	<0.191	<0.191	<0.191	NA	NA	NA	NA	NA	NA
	06/03/13	<90.0	<0.236	<0.378	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	**0.640**	**4.12**	<0.190	<0.190	<0.190	NA	NA	NA	NA	NA	NA
	12/16/13	<90.0	<0.235	<0.392	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	<0.0953	<0.0953	<0.0953	**0.247**	**0.0719**	**0.520**	**55.3**	**405**	NA
	02/13/14	<100	0.259	<0.393	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<0.0952	<0.0952	<0.0952	**1.29**	**0.410**	<0.200	**55.6**	**455**	NA
	05/29/14	<100	<0.237	<0.395	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**2.10**	<0.101	<0.101	<0.101	**0.970**	**0.148**	**0.560**	**44.7**	**415**	NA
	08/26/14	<100	<0.233	<0.389	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**6.29**	<0.0949	<0.0949	<0.0949	**0.589**	**0.00642**	**2.52**	**62.8**	**450**	NA
	11/25/14	<100	<0.231	<0.386	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<0.0215	**0.0456**	**0.0216**	**1.05**	**0.117**	**0.540**	**66.5**	**420**	**2.36**
	02/19/15	<100	<0.23	<0.39	**1.0**	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<0.085	<0.085	<0.085	**1.80**	**0.11**	<0.20	**50**	**520**	**2.9**
	05/11/15	<100	<0.24	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<0.086	<0.086	<0.086	**0.73**	**0.29**	**1.4**	**47**	**450**	**2.4**
	08/24/15	<100	<0.23	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	**1.8**	<0.085	<0.085	<0.085	**0.43**	**0.029**	**0.77**	**46**	**460**	**2.3**
MW-5	05/06/13	<90.0	<0.251	<0.402	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	<0.195	<0.195	<0.195	NA	NA	NA	NA	NA	NA
	06/03/13	<90.0	<0.238	<0.381	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	**1.05**	**6.94**	<0.190	<0.190	<0.190	NA	NA	NA	NA	NA	NA
	12/16/13	<90.0	<0.235	<0.391	<0.200	<0.500	<0.500	<0.500	<0.500	<1.00	NA	NA	<0.0965	<0.0965	<0.0965	**0.532**	<0.00500	**7.50**	**77.9**	**360**	NA
	02/13/14	<100	<0.234	<0.390	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**8.05**	<0.0950	<0.0950	<0.0950	**0.939**	<0.00500	**6.15**	**71.9**	**340**	NA
	05/29/14	<100	<0.241	<0.402	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**6.91**	<0.0960	<0.0960	<0.0960	**0.549**	**0.0682**	**8.20**	**69.8**	**345**	NA
	08/26/14	<100	<0.233	<0.388	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	**4.25**	<0.0952	<0.0952	<0.0952	**0.705**	**0.0210**	**6.44**	**72.8**	**395**	NA
	11/25/14	<100	**0.341**	<0.388	<0.200	<1.00	<1.00	<2.00	<1.00	<1.00	**1.05**	**6.29**	<0.0214	<0.0214	**0.0350**	**0.498**	<0.00500	**4.74**	**65.9**	**360**	**1.80**
	02/19/15	<100	<0.23	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	**5.4**	<0.085	<0.085	<0.085	**0.55**	<0.00500	**4.4**	**60**	**370**	**1.9**
	05/11/15	<100	<0.23	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	**6.2**	<0.085	<0.085	<0.085	**0.39**	<0.0050	**4.2**	**43**	**340**	**1.6**
	08/24/15	<100	<0.23	<0.39	<0.20	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	**5.9**	<0.085	<0.085	<0.085	**0.53**	<0.0050	**5.40**	**60**	**320**	**1.9**

Monitoring Well ID	Date Sampled	Petroleum-Range Hydrocarbons			Volatile Organic Compounds[4] (µg/L)								Naphthalenes[7] (µg/L)			Natural Attenuation Parameters (mg/L)					
		GRPH[2] (µg/L)	DRPH[3] (mg/L)	ORPH[3] (mg/L)	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Hexane	TCE[5]	PCE[6]	Naphthalene	1-Methyl-naphthalene	2- Methyl-naphthalene	Manganese[8]	Methane[9]	Nitrate-Nitrogen[10]	Sulfate[10]	Total Alkalinity[11]	Total Organic Carbon[12]
MTCA CUL[13]		**800/1,000[14]**	**0.5**	**0.5**	**5**	**1,000**	**700**	**1,000[15]**		**480[16]**	**5**	**5**	**160[17]**			**2.2[8]**	**–**	**10[10]**	**250[10]**	**NE**	**NE**
Duplicate-1	10/19/12	**5,080**	**2.44**	<0.298	**261**	**98**	**184**	**433**	**180**	**4.36**	NA	NA	**120**	**31.0**	**41.0**	NA	NA	NA	NA	NA	NA
	01/17/13	**9,890**	**2.63**	<0.380	**562**	**628**	**529**	**1,220**	**345**	<1.00	NA	NA	**101**	**21.9**	**21.0**	NA	NA	NA	NA	NA	NA
	04/01/13	**32,400**	**11.3**	<0.258	**1,450**	**1,190**	**1,310**	**4,580**	**1,130**	<20	NA	NA	**278**	**49.9**	**72.1**	NA	NA	NA	NA	NA	NA
	06/03/13	**<9,000**	**2.01**	<0.381	**289**	**185**	**292**	**971**	**189**	<100	NA	NA	**105**	**26.2**	**26.6**	NA	NA	NA	NA	NA	NA
	12/16/13	**30,700**	**5.27**	<0.379	**1,010**	**1,300**	**1,360**	**5,170**	**1,110**	<100	NA	NA	**244**	**47.0**	**67.0**	**3.38**	**3.30**	**2.77**	**14.3**	**560**	NA
	02/13/14	**21,900**	**9.10**	<0.385	**781**	**707**	**876**	**4,080**	**759**	<100	<100[18]	<100[18]	**293**	**57.6**	**87.2**	**3.79**	**6.64**	**0.290**	**12.0**	**600**	NA
	05/29/14	**20,400**	**10.2**	<0.390	**803**	**1,090**	**981**	**3,990**	**813**	<100	<100[18]	<100[18]	**283**	**48.9**	**74.8**	**3.94**	**4.69**	**0.260**	**10.1**	**555**	NA
	08/26/14	**14,500**	**6.00**	<0.391	**546**	**667**	**847**	**2,540**	**841**	<100	<100[18]	<100[18]	**350**	**78.5**	**105**	**3.77**	**1.94**	**<0.200**	**14.3**	**590**	NA
	11/25/14	**16,500**	**5.30**	**0.499**	**570**	**531**	**777**	**2,620**	**591**	<1.00	<1.00	<1.00	**367**	**101**	**141**	**3.05**	**3.44**	**<0.200**	**16.8**	**515**	**11.1**
	02/19/15	**18,000**	**8.5**	<0.39	**750**	**670**	**1,100**	**4,200**	**800**	<100	<100[18]	<100[18]	**250**	**52**	**74**	**4.0**	**1.7**	**0.24**	**8.7**	**650**	**16**
	05/11/15	**11,000**	**2.6**	<0.39	**240**	**260**	**370**	**1,300**	**150**	<100	<100[18]	<100[18]	**250**	**53**	**71**	**3.1**	**6.5**	**0.63**	**8.6**	**440**	**6.9**
	08/24/15	**18,000**	**5.0**	<0.39	**550**	**1,100**	**860**	**3,000**	**730**	8.6	1.2	<1.0	**170**	**45**	**62**	**3.7**	**6.9**	<0.20	**12**	**570**	**15**

Notes:

[1]Samples analyzed by TestAmerica Laboratories, Inc. located in Spokane Valley, Washington.

[2]Gasoline-range petroleum hydrocarbons (GRPH) analyzed using Northwest Method NWTPH-Gx.

[3]Diesel- and oil-range petroleum hydrocarbons (DRPH and ORPH, respectively) analyzed using Northwest Method NWTPH-Dx.

[4]Volatile organic compounds analyzed using Environmental Protection Agency (EPA) Method 8260C.

[5]TCE = Trichloroethene

[6]PCE = Tetrachloroethene

[7]Naphthalenes analyzed using EPA Method 8270D.

[8]Dissolved manganese analyzed using EPA Method 200.7. The cleanup level is the standard formula value MTCA Method B in groundwater as calculated by Ecology's Cleanup Levels and Risk Calculations (CLARC) database.

[9]Methane analyzed using method RSK-175.

[10]Nitrate-nitrogen and sulfate analyzed using EPA Method 300.0. The cleanup level refers to the Maximum Contaminant Level (MCL) for nitrate and the Secondary MCL for sulfate as recommended by the EPA.

[11]Alkalinity analyzed using Method SM 2320B.

[12]Total organic carbon analyzed using Method SM 5310C.

[13]Washington State Model Toxics Control Act (MTCA) Method A cleanup levels (CUL) for groundwater, unless otherwise footnoted.

[14]MTCA Method A cleanup level for gasoline-range petroleum hydrocarbons is 1,000 micrograms per liter (µg/L) if benzene is not detected; otherwise the cleanup level is 800 µg/L.

[15]Cleanup level for total xylenes (m,p-xylene and o-xylene).

[16]MTCA Method B (non-carcinogen) cleanup level.

[17]Cleanup level for total naphthalenes (naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene).

[18]Reporting limits greater than respective MTCA Method A cleanup level caused by high petroleum hydrocarbon and associated VOC concentrations in the samples

Bold indicates the analyte was detected at a concentration greater then the laboratory reporting limit.

indicates the analyte was detected at a concentration greater than the established cleanup level.

mg/L = milligrams per liter

Table A-3

Summary of Chemical Analytical Results - Soil[1]

Former L&L Exxon, 1315 Lee Boulevard
Richland, Washington

Sample ID	Date Sampled	GRPH[2] (mg/kg)	Volatile Organic Compounds[3] (mg/L)				
			Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene
MTCA CUL[4]		**30/100[5]**	**0.03**	**7**	**6**	**9[6]**	
EX-SW-1(2-3)	07/08/15	**17,000**	<1.8	<1.8	<1.8	**250**	**200**

Notes:

[1]Samples analyzed by TestAmerica Laboratories, Inc. located in Spokane Valley, Washington.

[3]Gasoline-range petroleum hydrocarbons (GRPH) analyzed using Northwest Method NWTPH-Gx.

[3]Volatile organic compounds analyzed using Environmental Protection Agency (EPA) Method 8260C.

[4]Washington State Model Toxics Control Act (MTCA) Method A cleanup levels (CUL) for groundwater, unless otherwise footnoted.

[5]MTCA Method A cleanup level for gasoline-range petroleum hydrocarbons is 100 mg/kg if benzene is not detected; otherwise the cleanup level is 30 mg/kg.

[6]Cleanup level for total xylenes (m,p-xylene and o-xylene).

Bold indicates the analyte was detected at a concentration greater then the laboratory reporting limit.

indicates the analyte was detected at a concentration greater than the established cleanup level.

mg/kg = milligrams per kilograms; mg/L = milligrams per liter

APPENDIX B
Density Testing Reports

Northern, Inc.
Consulting Engineers Environmental Scientists Construction Materials Testing

PROJECT CONTROL REPORT

REPORT TO:	Sandry Construction 4007 E Trent Avenue Spokane, WA 99202
PROJECT NAME:	L & L Exxon Infiltration Gallery – Richland, WA
PROJECT#:	K15-605
REPORT OF:	Compaction testing of 5/8" minus material for infiltration trenches.
DATE:	July 8, 2015

SAMPLE IDENTIFICATION: Attached are the results of field density tests performed on the above-referenced project on the dates and at the locations shown. Unless otherwise noted, our personnel utilized the nuclear densometer method of testing in accordance with ASTM D6938-08. In accordance with our quality control procedures, occasional routine correlation tests are performed using sand cone methods in accordance with ASTM D1556.

CONTRACTOR:	Sandry Constriction
TEST LOCATIONS WERE SELECTED BY:	GN Northern Personnel
TESTS WERE PERFORMED BY:	EH
MINIMUM REQUIRED IN-PLACE DENSITY:	95% of ASTM D1557
NUCLEAR DENSOMETER USED:	TROXLER MODEL #: 3430 SERIAL #: 23852
REMARKS:	

REVIEWED BY: _____
Guy Vincent, Regional Testing Manager

722 N 16th Avenue, Suite 31
Yakima WA 98902
509/248-9798
509/248-4220 Fax

2618 W Kennewick Ave
Kennewick WA 99336
509/734-9320
509/734-9321 Fax

11115 E. Montgomery Suite C
Spokane Valley WA 99206
509-893-9400
877-258-9211 Fax

315 Oak St Suite 201
Hood River OR 97031
541/387-3387

81006 HWY 395
Hermiston OR 97838
541/564-0991

Visit our website at www.gnnorthern.com
Email: gnnorthern@gnnorthern.com

L & L Exxon Infiltration Gallery – Richland, WA
K15-605
July 8, 2015

TEST RESULTS:

TEST DATE	LAB NUMBER	FIELD MOISTURE CONTENT PERCENT	FIELD DRY DENSITY PCF	MAXIMUM LAB DRY DENSITY PCF	MAXIMUM OBTAINED PERCENT
7-8-15	1530	7.8	138.2	141.0	98.0

Location: North trench 10 feet east of west infiltration tube, 18 inches below final sub grade, 6 inch test depth, 12 inch lift thickness.

7-8-15	1531	7.2	135.8	141.0	96.3

Location: North trench 4 feet west of east infiltration tube, 18 inches below final sub grade, 6 inch test depth, 12 inch lift thickness.

7-8-15	1532	6.9	135.8	141.0	96.3

Location: South trench 7 feet east of west infiltration tube, 18 inches below final sub grade, 6 inch test depth, 12 inch lift thickness.

7-8-15	1533	6.2	136.4	141.0	95.3

Location: South trench 5 feet west of west infiltration tube, 18 inches below final sub grade, 6 inch test depth, 12 inch lift thickness.

7-8-15	1534	7.2	136.3	141.0	96.7

Location: North trench 7 feet east of west infiltration tube, 6 inches below final sub grade, 6 inch test depth, 12 inch lift thickness.

7-8-15	1535	6.3	135.2	141.0	95.9

Location: South trench 6 feet west of west infiltration tube, 6 inches below final sub grade, 6 inch test depth, 12 inch lift thickness.

7-8-15	1536	3.4	136.4	141.0	96.7

Location: North trench 6 feet west of west infiltration tube, 6 inches below final sub grade, 6 inch test depth, 6 inch lift thickness.

7-8-15	1537	3.3	136.9	141.0	97.1

Location: South trench 5 feet west of west infiltration tube, 6 inches below final sub grade, 6 inch test depth, 6 inch lift thickness.

Northern, Inc.

L & L Exxon Infiltration Gallery – Richland, WA
K15-605
July 8, 2015

TEST RESULTS:

TEST DATE	LAB NUMBER	FIELD MOISTURE CONTENT PERCENT	FIELD DRY DENSITY PCF	MAXIMUM LAB DRY DENSITY PCF	MAXIMUM OBTAINED PERCENT
7-8-15	1538	5.2	135.4	141.0	96.0

Location: South trench 7 feet east of west infiltration tube, 6 inches below final sub grade, 6 inch test depth, 6 inch lift thickness.

Moisture Density Curve Number = 133.7 pcf @ 7.8%

Northern, Inc.
Consulting Engineers Environmental Scientists Construction Materials Testing

PROJECT CONTROL REPORT

REPORT TO: Sandry Construction
4007 E Trent Avenue
Spokane, WA 99202

PROJECT NAME: L & L Exxon Infiltration Gallery – Richland, WA

PROJECT#: K15-605

REPORT OF: Compaction testing of asphalt for parking lot.

DATE: July 10, 2015

SAMPLE IDENTIFICATION: Attached are the results of field density tests performed on the above-referenced project on the dates and at the locations shown. Unless otherwise noted, our personnel utilized the nuclear densometer method of testing in accordance with ASTM D6938-08. In accordance with our quality control procedures, occasional routine correlation tests are performed using sand cone methods in accordance with ASTM D1556.

CONTRACTOR: Sandry Constriction

TEST LOCATIONS WERE SELECTED BY: GN Northern Personnel

TESTS WERE PERFORMED BY: TM

MINIMUM REQUIRED IN-PLACE DENSITY: 92% of RICE

NUCLEAR DENSOMETER USED: TROXLER MODEL #: 3430
SERIAL #: 26005

REMARKS:

REVIEWED BY: _____
Guy Vincent, Regional Testing Manager

722 N 16th Avenue, Suite 31
Yakima WA 98902
509/248-9798
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2618 W Kennewick Ave
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541/388-3388 Fax

81006 HWY 395
Hermiston OR 97838
541/564-0991

Visit our website at www.gnnorthern.com

L & L Exxon Infiltration Gallery – Richland, WA
K15-605
July 10, 2015

TEST RESULTS:

TEST DATE	LAB NUMBER	LIFT THICKNESS IN INCHES	MAXIMUM THEORETICAL DENSITY PCF	WET FIELD DENSITY PCF	MAXIMUM OBTAINED PERCENT
7-10-15	16169	2.0	157.0	145.3	92.5
Location: East side of parking lot, final lift.					
7-10-15	16170	2.0	157.0	146.2	93.1
Location: Center of parking lot, final lift.					
7-10-15	16171	2.0	157.0	145.4	92.6
Location: West side of parking lot, final lift.					

RICE DENSITY = 157.0 pcf

APPENDIX C
Data Validation Report and Analytical Laboratory Report

APPENDIX C
DATA VALIDATION REPORT AND ANALYTICAL LABORATORY REPORT

CHEMICAL ANALYTICAL DATA

Samples

Chain-of-custody procedures were followed during the transport of the field samples to the accredited analytical laboratory. 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

During the August 2015 groundwater monitoring event, a duplicate sample was collected from MW 1 and designated Duplicate-1. The relative percent difference (RPD) between the concentrations of contaminants reported for the primary (X_1) and duplicate (X_2) samples was calculated using the following equation if both positive concentrations were more than 5 times the reporting limit:

$$RPD = \frac{|X_1 - X_2|}{(X_1 + X_2)/2} * 100$$

The resulting RPDs calculated using this method are shown below:

- DRPH: 8.33 percent
- Benzene: 11.54 percent
- Toluene: 22.22 percent
- Ethylbenzene: 15.00 percent
- o-Xylene: 14.71 percent
- m,p-Xylenes: 14.29 percent
- 1-methylnaphthalene: 31.78 percent
- 2-methylnaphthalene: 33.56 percent
- Naphthalene: 34.15 percent
- Manganese: 2.67 percent
- Methane: 6.99 percent

RPDs (except for 1-meethylnaphthalene, 2-methylnaphthalene, and naphthalene) are less than the control limit of 30 percent used for this method for groundwater samples. 1-meethylnaphthalene, 2-methylnaphthalene, and naphthalene were above the 30 percent control limit. Although the RPD for sulfate during this sampling event is higher than the control limit for groundwater samples, it is our opinion that the data are acceptable for use because the samples are not being used to close the site or assess an

active remediation. This data may suggest, however, there is variability in the sample stream. Sampling procedures will be re-accessed to minimize associated analytical variability.

If both positive concentrations of contaminants were not more than 5 times the reporting limit the data were analyzed by calculating the relative difference (RD) between the numbers as shown below:

$$RD = \left| X_1 - X_2 \right|$$

The resulting RDs calculated using this method are shown below:

- GRPH: 3,000 µg/L

The control limit used for this method for groundwater samples is the reporting limit. The RD for GRPH was less than the control limits.

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 reports. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory report.

Data Quality Exception Summary

Based on our data quality review, it is our opinion that the analytical data are of acceptable quality for their 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: 590-1837-1
Client Project/Site: L&L Exxon (0504-081-01)

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

Attn: Scott Lathen

Authorized for release by:
9/8/2015 10:58:28 AM

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

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Job ID: 590-1837-1

Laboratory: TestAmerica Spokane

Narrative

Receipt
The samples were received on 8/28/2015 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.2º C.

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

GC/MS Semi VOA Method 8270D SIM:
The following samples required a dilution due to the nature of the sample matrix: MW-1-082415 (590-1837-1), MW-2-082415 (590-1837-2), MW-2-082415 (590-1837-2) and MW-Dup-082415 (590-1837-6). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

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

GC Semi VOA Method NWTPH-Dx:
Detected hydrocarbons in the diesel range appear to be due to gasoline overlap in the following samples: MW-1-082415 (590-1837-1), MW-2-082415 (590-1837-2) and MW-Dup-082415 (590-1837-6).

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

Metals
No analytical or quality issues were noted, other than those described 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: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-1837-1	MW-1-082415	Water	08/24/15 12:53	08/28/15 09:40
590-1837-2	MW-2-082415	Water	08/24/15 12:06	08/28/15 09:40
590-1837-3	MW-3-082415	Water	08/24/15 11:33	08/28/15 09:40
590-1837-4	MW-4-082415	Water	08/24/15 10:03	08/28/15 09:40
590-1837-5	MW-5-082415	Water	08/24/15 10:54	08/28/15 09:40
590-1837-6	MW-Dup-082415	Water	08/24/15 12:00	08/28/15 09:40

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

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: MW-1-082415

Date Collected: 08/24/15 12:53
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**490**		20		ug/L			09/01/15 09:51	100
Ethylbenzene	**740**		100		ug/L			09/01/15 09:51	100
m,p-Xylene	**2600**		200		ug/L			09/01/15 09:51	100
o-Xylene	**630**		100		ug/L			09/01/15 09:51	100
Toluene	**880**		100		ug/L			09/01/15 09:51	100
Xylenes, Total	**3200**		300		ug/L			09/01/15 09:51	100
Hexane	**9.6**		1.0		ug/L			08/31/15 18:24	1
Tetrachloroethene	ND		1.0		ug/L			08/31/15 18:24	1
Trichloroethene	ND		1.0		ug/L			08/31/15 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 140*		*08/31/15 18:24*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 140*		*09/01/15 09:51*	*100*
4-Bromofluorobenzene (Surr)	*94*		*68.7 - 141*		*08/31/15 18:24*	*1*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*09/01/15 09:51*	*100*
Dibromofluoromethane (Surr)	*98*		*71.2 - 143*		*08/31/15 18:24*	*1*
Dibromofluoromethane (Surr)	*97*		*71.2 - 143*		*09/01/15 09:51*	*100*
Toluene-d8 (Surr)	*92*		*74.1 - 135*		*08/31/15 18:24*	*1*
Toluene-d8 (Surr)	*102*		*74.1 - 135*		*09/01/15 09:51*	*100*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**15000**		10000		ug/L			09/01/15 09:51	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*09/01/15 09:51*	*100*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**240**		1.7		ug/L		08/31/15 10:58	08/31/15 19:25	20
2-Methylnaphthalene	**87**		1.7		ug/L		08/31/15 10:58	08/31/15 19:25	20
1-Methylnaphthalene	**62**		1.7		ug/L		08/31/15 10:58	08/31/15 19:25	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*58*		*32.7 - 135*	*08/31/15 10:58*	*08/31/15 19:25*	*20*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**7.4**		0.20		mg/L			09/03/15 16:10	40

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*92*		*62 - 124*		*09/03/15 16:04*	*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)	**4.6**		0.23		mg/L		09/01/15 11:17	09/01/15 17:26	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		09/01/15 11:17	09/01/15 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*50 - 150*	*09/01/15 11:17*	*09/01/15 17:26*	*1*

Client Sample ID: MW-1-082415

Lab Sample ID: 590-1837-1

Date Collected: 08/24/15 12:53

Matrix: Water

Date Received: 08/28/15 09:40

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

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Triacontane-d62	89		50 - 150	09/01/15 11:17	09/01/15 17:26	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**3.8**		0.010		mg/L		09/01/15 10:10	09/02/15 11:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**15**		1.0		mg/L			09/01/15 11:44	1

Client Sample ID: MW-2-082415

Lab Sample ID: 590-1837-2

Date Collected: 08/24/15 12:06

Matrix: Water

Date Received: 08/28/15 09:40

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**1.8**		0.20		ug/L			08/31/15 18:45	1
Ethylbenzene	**2300**		100		ug/L			09/01/15 10:12	100
m,p-Xylene	**8400**		200		ug/L			09/01/15 10:12	100
o-Xylene	**3900**		100		ug/L			09/01/15 10:12	100
Toluene	**9000**		100		ug/L			09/01/15 10:12	100
Xylenes, Total	**12000**		300		ug/L			09/01/15 10:12	100
Hexane	**17**		1.0		ug/L			08/31/15 18:45	1
Tetrachloroethene	ND		1.0		ug/L			08/31/15 18:45	1
Trichloroethene	ND		1.0		ug/L			08/31/15 18:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		70 - 140		08/31/15 18:45	1
1,2-Dichloroethane-d4 (Surr)	107		70 - 140		09/01/15 10:12	100
4-Bromofluorobenzene (Surr)	104		68.7 - 141		08/31/15 18:45	1
4-Bromofluorobenzene (Surr)	102		68.7 - 141		09/01/15 10:12	100
Dibromofluoromethane (Surr)	100		71.2 - 143		08/31/15 18:45	1
Dibromofluoromethane (Surr)	100		71.2 - 143		09/01/15 10:12	100
Toluene-d8 (Surr)	83		74.1 - 135		08/31/15 18:45	1
Toluene-d8 (Surr)	106		74.1 - 135		09/01/15 10:12	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**55000**		10000		ug/L			09/01/15 10:12	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		68.7 - 141		09/01/15 10:12	100

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**320**		3.4		ug/L		08/31/15 10:58	09/01/15 11:16	40
2-Methylnaphthalene	**120**		1.7		ug/L		08/31/15 10:58	08/31/15 19:51	20
1-Methylnaphthalene	**76**		1.7		ug/L		08/31/15 10:58	08/31/15 19:51	20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	39		32.7 - 135	08/31/15 10:58	08/31/15 19:51	20

Client Sample ID: MW-2-082415

Date Collected: 08/24/15 12:06
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-2

Matrix: Water

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	*15*	*X*	*32.7 - 135*	*08/31/15 10:58*	*09/01/15 11:16*	*40*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**5.5**		0.10		mg/L			09/03/15 16:46	20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acetylene (Surr)	*103*		*62 - 124*		*09/03/15 16:40*	*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)	**3.9**		0.24		mg/L		09/01/15 11:17	09/01/15 17:46	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		09/01/15 11:17	09/01/15 17:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*85*		*50 - 150*	*09/01/15 11:17*	*09/01/15 17:46*	*1*
n-Triacontane-d62	*92*		*50 - 150*	*09/01/15 11:17*	*09/01/15 17:46*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**3.8**		0.010		mg/L		09/01/15 10:10	09/02/15 11:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**13**		1.0		mg/L			09/01/15 11:44	1

Client Sample ID: MW-3-082415

Date Collected: 08/24/15 11:33
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-3

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.20		ug/L			09/01/15 10:32	1
Ethylbenzene	ND		1.0		ug/L			09/01/15 10:32	1
m,p-Xylene	ND		2.0		ug/L			09/01/15 10:32	1
o-Xylene	ND		1.0		ug/L			09/01/15 10:32	1
Toluene	ND		1.0		ug/L			09/01/15 10:32	1
Xylenes, Total	ND		3.0		ug/L			09/01/15 10:32	1
Hexane	ND		1.0		ug/L			09/01/15 10:32	1
Tetrachloroethene	**8.7**		1.0		ug/L			09/01/15 10:32	1
Trichloroethene	ND		1.0		ug/L			09/01/15 10:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 140*		*09/01/15 10:32*	*1*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*		*09/01/15 10:32*	*1*
Dibromofluoromethane (Surr)	*97*		*71.2 - 143*		*09/01/15 10:32*	*1*
Toluene-d8 (Surr)	*104*		*74.1 - 135*		*09/01/15 10:32*	*1*

Client Sample ID: MW-3-082415

Date Collected: 08/24/15 11:33
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			09/01/15 10:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*		*09/01/15 10:32*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 15:25	1
2-Methylnaphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 15:25	1
1-Methylnaphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*94*		*32.7 - 135*	*08/31/15 10:58*	*08/31/15 15:25*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			09/03/15 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*90*		*62 - 124*		*09/03/15 16:50*	*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		0.23		mg/L		09/01/15 11:17	09/01/15 17:46	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		09/01/15 11:17	09/01/15 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*50 - 150*	*09/01/15 11:17*	*09/01/15 17:46*	*1*
n-Triacontane-d62	*72*		*50 - 150*	*09/01/15 11:17*	*09/01/15 17:46*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**0.012**		0.010		mg/L		09/01/15 10:10	09/02/15 11:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**2.1**		1.0		mg/L			09/01/15 11:44	1

Client Sample ID: MW-4-082415

Date Collected: 08/24/15 10:03
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.20		ug/L			08/31/15 19:26	1
Ethylbenzene	ND		1.0		ug/L			08/31/15 19:26	1
m,p-Xylene	ND		2.0		ug/L			08/31/15 19:26	1
o-Xylene	ND		1.0		ug/L			08/31/15 19:26	1
Toluene	ND		1.0		ug/L			08/31/15 19:26	1
Xylenes, Total	ND		3.0		ug/L			08/31/15 19:26	1

Client Sample ID: MW-4-082415
Date Collected: 08/24/15 10:03
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexane	ND		1.0		ug/L			08/31/15 19:26	1
Tetrachloroethene	**1.8**		1.0		ug/L			08/31/15 19:26	1
Trichloroethene	ND		1.0		ug/L			08/31/15 19:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 140*		*08/31/15 19:26*	*1*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*08/31/15 19:26*	*1*
Dibromofluoromethane (Surr)	*101*		*71.2 - 143*		*08/31/15 19:26*	*1*
Toluene-d8 (Surr)	*100*		*74.1 - 135*		*08/31/15 19:26*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			08/31/15 19:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*08/31/15 19:26*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 15:52	1
2-Methylnaphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 15:52	1
1-Methylnaphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*97*		*32.7 - 135*	*08/31/15 10:58*	*08/31/15 15:52*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**0.029**		0.0050		mg/L			09/03/15 16:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*89*		*62 - 124*		*09/03/15 16:54*	*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		0.23		mg/L		09/01/15 11:17	09/01/15 15:04	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		09/01/15 11:17	09/01/15 15:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:04*	*1*
n-Triacontane-d62	*76*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:04*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**0.43**		0.010		mg/L		09/01/15 10:10	09/02/15 11:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**2.3**		1.0		mg/L			09/01/15 11:44	1

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Client Sample ID: MW-5-082415
Date Collected: 08/24/15 10:54
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.20		ug/L			08/31/15 19:47	1
Ethylbenzene	ND		1.0		ug/L			08/31/15 19:47	1
m,p-Xylene	ND		2.0		ug/L			08/31/15 19:47	1
o-Xylene	ND		1.0		ug/L			08/31/15 19:47	1
Toluene	ND		1.0		ug/L			08/31/15 19:47	1
Xylenes, Total	ND		3.0		ug/L			08/31/15 19:47	1
Hexane	ND		1.0		ug/L			08/31/15 19:47	1
Tetrachloroethene	**5.9**		1.0		ug/L			08/31/15 19:47	1
Trichloroethene	ND		1.0		ug/L			08/31/15 19:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 140*		*08/31/15 19:47*	*1*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*08/31/15 19:47*	*1*
Dibromofluoromethane (Surr)	*99*		*71.2 - 143*		*08/31/15 19:47*	*1*
Toluene-d8 (Surr)	*107*		*74.1 - 135*		*08/31/15 19:47*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			08/31/15 19:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*08/31/15 19:47*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 16:18	1
2-Methylnaphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 16:18	1
1-Methylnaphthalene	ND		0.085		ug/L		08/31/15 10:58	08/31/15 16:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*97*		*32.7 - 135*	*08/31/15 10:58*	*08/31/15 16:18*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			09/03/15 16:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*90*		*62 - 124*		*09/03/15 16:57*	*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		09/01/15 11:17	09/01/15 15:24	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		09/01/15 11:17	09/01/15 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*91*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:24*	*1*
n-Triacontane-d62	*77*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:24*	*1*

Client Sample ID: MW-5-082415

Lab Sample ID: 590-1837-5

Date Collected: 08/24/15 10:54

Matrix: Water

Date Received: 08/28/15 09:40

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.53		0.010		mg/L		09/01/15 10:10	09/02/15 11:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.9		1.0		mg/L			09/01/15 11:44	1

Client Sample ID: MW-Dup-082415

Lab Sample ID: 590-1837-6

Date Collected: 08/24/15 12:00

Matrix: Water

Date Received: 08/28/15 09:40

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	550		20		ug/L			09/01/15 10:53	100
Ethylbenzene	860		100		ug/L			09/01/15 10:53	100
m,p-Xylene	3000		200		ug/L			09/01/15 10:53	100
o-Xylene	730		100		ug/L			09/01/15 10:53	100
Toluene	1100		100		ug/L			09/01/15 10:53	100
Xylenes, Total	3700		300		ug/L			09/01/15 10:53	100
Hexane	8.6		1.0		ug/L			08/31/15 20:08	1
Tetrachloroethene	ND		1.0		ug/L			08/31/15 20:08	1
Trichloroethene	1.2		1.0		ug/L			08/31/15 20:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*70 - 140*		*08/31/15 20:08*	*1*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 140*		*09/01/15 10:53*	*100*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*08/31/15 20:08*	*1*
4-Bromofluorobenzene (Surr)	*101*		*68.7 - 141*		*09/01/15 10:53*	*100*
Dibromofluoromethane (Surr)	*97*		*71.2 - 143*		*08/31/15 20:08*	*1*
Dibromofluoromethane (Surr)	*95*		*71.2 - 143*		*09/01/15 10:53*	*100*
Toluene-d8 (Surr)	*94*		*74.1 - 135*		*08/31/15 20:08*	*1*
Toluene-d8 (Surr)	*106*		*74.1 - 135*		*09/01/15 10:53*	*100*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	18000		10000		ug/L			09/01/15 10:53	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*68.7 - 141*		*09/01/15 10:53*	*100*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	170		1.7		ug/L		08/31/15 10:58	08/31/15 20:18	20
2-Methylnaphthalene	62		1.7		ug/L		08/31/15 10:58	08/31/15 20:18	20
1-Methylnaphthalene	45		1.7		ug/L		08/31/15 10:58	08/31/15 20:18	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*25*	*X*	*32.7 - 135*	*08/31/15 10:58*	*08/31/15 20:18*	*20*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	6.9		0.20		mg/L			09/03/15 17:08	40

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Client Sample ID: MW-Dup-082415

Date Collected: 08/24/15 12:00
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-6

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*93*		*62 - 124*		*09/03/15 17:00*	*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)	**5.0**		0.24		mg/L		09/01/15 11:17	09/01/15 15:45	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		09/01/15 11:17	09/01/15 15:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:45*	*1*
n-Triacontane-d62	*85*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:45*	*1*

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**3.7**		0.010		mg/L		09/01/15 10:10	09/02/15 11:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**15**		1.0		mg/L			09/01/15 11:44	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 590-3238/4
Matrix: Water
Analysis Batch: 3238

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.20		ug/L			08/31/15 15:59	1
Ethylbenzene	ND		1.0		ug/L			08/31/15 15:59	1
m,p-Xylene	ND		2.0		ug/L			08/31/15 15:59	1
o-Xylene	ND		1.0		ug/L			08/31/15 15:59	1
Toluene	ND		1.0		ug/L			08/31/15 15:59	1
Xylenes, Total	ND		3.0		ug/L			08/31/15 15:59	1
Hexane	ND		1.0		ug/L			08/31/15 15:59	1
Tetrachloroethene	ND		1.0		ug/L			08/31/15 15:59	1
Trichloroethene	ND		1.0		ug/L			08/31/15 15:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 140*		*08/31/15 15:59*	*1*
4-Bromofluorobenzene (Surr)	*106*		*68.7 - 141*		*08/31/15 15:59*	*1*
Dibromofluoromethane (Surr)	*98*		*71.2 - 143*		*08/31/15 15:59*	*1*
Toluene-d8 (Surr)	*99*		*74.1 - 135*		*08/31/15 15:59*	*1*

Lab Sample ID: LCS 590-3238/1003
Matrix: Water
Analysis Batch: 3238

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 - 140
Ethylbenzene	10.0	10.3		ug/L		102	80 - 120
m,p-Xylene	10.0	10.2		ug/L		101	80 - 120
o-Xylene	10.0	10.3		ug/L		103	80 - 120
Toluene	10.0	10.0		ug/L		100	80 - 123
Hexane	10.0	10.2		ug/L		101	60 - 140
Tetrachloroethene	10.0	10.2		ug/L		102	60 - 140
Trichloroethene	10.0	10.3		ug/L		103	74.8 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 140*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*
Dibromofluoromethane (Surr)	*100*		*71.2 - 143*
Toluene-d8 (Surr)	*98*		*74.1 - 135*

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

Lab Sample ID: MB 590-3237/4
Matrix: Water
Analysis Batch: 3237

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		100		ug/L			08/31/15 15:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*68.7 - 141*		*08/31/15 15:59*	*1*

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

Lab Sample ID: LCS 590-3237/1001
Matrix: Water
Analysis Batch: 3237

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1000	992		ug/L		99	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 590-3234/1-A
Matrix: Water
Analysis Batch: 3235

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3234

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.090		ug/L		08/31/15 10:58	08/31/15 13:39	1
2-Methylnaphthalene	ND		0.090		ug/L		08/31/15 10:58	08/31/15 13:39	1
1-Methylnaphthalene	ND		0.090		ug/L		08/31/15 10:58	08/31/15 13:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*131*		*32.7 - 135*	*08/31/15 10:58*	*08/31/15 13:39*	*1*

Lab Sample ID: LCS 590-3234/2-A
Matrix: Water
Analysis Batch: 3235

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3234

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	1.60	1.26		ug/L		79	27.8 - 143

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*97*		*32.7 - 135*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 490-278831/4
Matrix: Water
Analysis Batch: 278831

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			09/03/15 13:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*93*		*62 - 124*		*09/03/15 13:53*	*1*

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 490-278831/5
Matrix: Water
Analysis Batch: 278831

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane			0.279	0.270		mg/L		97	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Acetylene (Surr)	*103*		*62 - 124*

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

Lab Sample ID: MB 590-3253/1-A
Matrix: Water
Analysis Batch: 3257

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3253

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		09/01/15 11:17	09/01/15 15:04	1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		09/01/15 11:17	09/01/15 15:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*82*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:04*	*1*
n-Triacontane-d62	*86*		*50 - 150*	*09/01/15 11:17*	*09/01/15 15:04*	*1*

Lab Sample ID: LCS 590-3253/2-A
Matrix: Water
Analysis Batch: 3257

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3253

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Diesel Range Organics (DRO) (C10-C25)			3.22	2.60		mg/L		81	50 - 150		
Residual Range Organics (RRO) (C25-C36)			3.29	3.29		mg/L		100	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*85*		*50 - 150*
n-Triacontane-d62	*93*		*50 - 150*

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 590-3251/2-A
Matrix: Water
Analysis Batch: 3275

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3251

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.010		mg/L		09/01/15 10:10	09/02/15 10:51	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 590-3251/1-A
Matrix: Water
Analysis Batch: 3275

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3251

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Manganese			1.00	0.993		mg/L		99	85 - 115		

Method: SM 5310C - TOC

Lab Sample ID: MB 490-278419/1
Matrix: Water
Analysis Batch: 278419

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0		mg/L			09/01/15 11:44	1

Lab Sample ID: LCS 490-278419/4
Matrix: Water
Analysis Batch: 278419

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon			10.0	9.29		mg/L		93	90 - 110		

Lab Sample ID: LCSD 490-278419/5
Matrix: Water
Analysis Batch: 278419

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
Total Organic Carbon			10.0	9.30		mg/L		93	90 - 110	0	20

Lab Sample ID: 590-1837-1 MS
Matrix: Water
Analysis Batch: 278419

Client Sample ID: MW-1-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon	15		20.0	34.1		mg/L		97	75 - 122		

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Client Sample ID: MW-1-082415

Date Collected: 08/24/15 12:53
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-1

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	8260C		1	43 mL	43 mL	3238	08/31/15 18:24	MRS	TAL SPK
Total/NA	Analysis	8260C		100	43 mL	43 mL	3238	09/01/15 09:51	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	43 mL	43 mL	3237	09/01/15 09:51	MRS	TAL SPK
Total/NA	Prep	3510C			264 mL	2 mL	3234	08/31/15 10:58	IAB	TAL SPK
Total/NA	Analysis	8270D SIM		20	264 mL	2 mL	3235	08/31/15 19:25	NMI	TAL SPK
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	278831	09/03/15 16:04	JML	TAL NSH
Total/NA	Analysis	RSK-175		40	21 mL	21 mL	278831	09/03/15 16:10	JML	TAL NSH
Total/NA	Prep	3510C			128 mL	2 mL	3253	09/01/15 11:17	IAB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	128 mL	2 mL	3257	09/01/15 17:26	NMI	TAL SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	3243	09/01/15 09:08	JSP	TAL SPK
Dissolved	Prep	200.7			50 mL	50 mL	3251	09/01/15 10:10	JSP	TAL SPK
Dissolved	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	3275	09/02/15 11:26	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	278419	09/01/15 11:44	JAB	TAL NSH

Client Sample ID: MW-2-082415

Date Collected: 08/24/15 12:06
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-2

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	8260C		1	43 mL	43 mL	3238	08/31/15 18:45	MRS	TAL SPK
Total/NA	Analysis	8260C		100	43 mL	43 mL	3238	09/01/15 10:12	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	43 mL	43 mL	3237	09/01/15 10:12	MRS	TAL SPK
Total/NA	Prep	3510C			263.6 mL	2 mL	3234	08/31/15 10:58	IAB	TAL SPK
Total/NA	Analysis	8270D SIM		20	263.6 mL	2 mL	3235	08/31/15 19:51	NMI	TAL SPK
Total/NA	Prep	3510C			263.6 mL	2 mL	3234	08/31/15 10:58	IAB	TAL SPK
Total/NA	Analysis	8270D SIM		40	263.6 mL	2 mL	3245	09/01/15 11:16	NMI	TAL SPK
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	278831	09/03/15 16:40	JML	TAL NSH
Total/NA	Analysis	RSK-175		20	21 mL	21 mL	278831	09/03/15 16:46	JML	TAL NSH
Total/NA	Prep	3510C			127.5 mL	2 mL	3253	09/01/15 11:17	IAB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	127.5 mL	2 mL	3257	09/01/15 17:46	NMI	TAL SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	3243	09/01/15 09:08	JSP	TAL SPK
Dissolved	Prep	200.7			50 mL	50 mL	3251	09/01/15 10:10	JSP	TAL SPK
Dissolved	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	3275	09/02/15 11:29	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	278419	09/01/15 11:44	JAB	TAL NSH

Client Sample ID: MW-3-082415

Date Collected: 08/24/15 11:33
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-3

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	8260C		1	43 mL	43 mL	3238	09/01/15 10:32	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	3237	09/01/15 10:32	MRS	TAL SPK

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Client Sample ID: MW-3-082415

Date Collected: 08/24/15 11:33
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			265.2 mL	2 mL	3234	08/31/15 10:58	IAB	TAL SPK
Total/NA	Analysis	8270D SIM		1	265.2 mL	2 mL	3235	08/31/15 15:25	NMI	TAL SPK
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	278831	09/03/15 16:50	JML	TAL NSH
Total/NA	Prep	3510C			129.3 mL	2 mL	3253	09/01/15 11:17	IAB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	129.3 mL	2 mL	3255	09/01/15 17:46	NMI	TAL SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	3243	09/01/15 09:08	JSP	TAL SPK
Dissolved	Prep	200.7			50 mL	50 mL	3251	09/01/15 10:10	JSP	TAL SPK
Dissolved	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	3275	09/02/15 11:31	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	278419	09/01/15 11:44	JAB	TAL NSH

Client Sample ID: MW-4-082415

Date Collected: 08/24/15 10:03
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-4

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	8260C		1	43 mL	43 mL	3238	08/31/15 19:26	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	3237	08/31/15 19:26	MRS	TAL SPK
Total/NA	Prep	3510C			263.8 mL	2 mL	3234	08/31/15 10:58	IAB	TAL SPK
Total/NA	Analysis	8270D SIM		1	263.8 mL	2 mL	3235	08/31/15 15:52	NMI	TAL SPK
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	278831	09/03/15 16:54	JML	TAL NSH
Total/NA	Prep	3510C			128.7 mL	2 mL	3253	09/01/15 11:17	IAB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	128.7 mL	2 mL	3255	09/01/15 15:04	NMI	TAL SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	3243	09/01/15 09:08	JSP	TAL SPK
Dissolved	Prep	200.7			50 mL	50 mL	3251	09/01/15 10:10	JSP	TAL SPK
Dissolved	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	3275	09/02/15 11:34	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	278419	09/01/15 11:44	JAB	TAL NSH

Client Sample ID: MW-5-082415

Date Collected: 08/24/15 10:54
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-5

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	8260C		1	43 mL	43 mL	3238	08/31/15 19:47	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	43 mL	43 mL	3237	08/31/15 19:47	MRS	TAL SPK
Total/NA	Prep	3510C			265.2 mL	2 mL	3234	08/31/15 10:58	IAB	TAL SPK
Total/NA	Analysis	8270D SIM		1	265.2 mL	2 mL	3235	08/31/15 16:18	NMI	TAL SPK
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	278831	09/03/15 16:57	JML	TAL NSH
Total/NA	Prep	3510C			129.5 mL	2 mL	3253	09/01/15 11:17	IAB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	129.5 mL	2 mL	3255	09/01/15 15:24	NMI	TAL SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	3243	09/01/15 09:08	JSP	TAL SPK
Dissolved	Prep	200.7			50 mL	50 mL	3251	09/01/15 10:10	JSP	TAL SPK
Dissolved	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	3275	09/02/15 11:39	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	278419	09/01/15 11:44	JAB	TAL NSH

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Client Sample ID: MW-Dup-082415

Date Collected: 08/24/15 12:00
Date Received: 08/28/15 09:40

Lab Sample ID: 590-1837-6

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	8260C		1	43 mL	43 mL	3238	08/31/15 20:08	MRS	TAL SPK
Total/NA	Analysis	8260C		100	43 mL	43 mL	3238	09/01/15 10:53	MRS	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	43 mL	43 mL	3237	09/01/15 10:53	MRS	TAL SPK
Total/NA	Prep	3510C			265.8 mL	2 mL	3234	08/31/15 10:58	IAB	TAL SPK
Total/NA	Analysis	8270D SIM		20	265.8 mL	2 mL	3235	08/31/15 20:18	NMI	TAL SPK
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	278831	09/03/15 17:00	JML	TAL NSH
Total/NA	Analysis	RSK-175		40	21 mL	21 mL	278831	09/03/15 17:08	JML	TAL NSH
Total/NA	Prep	3510C			127.2 mL	2 mL	3253	09/01/15 11:17	IAB	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	127.2 mL	2 mL	3255	09/01/15 15:45	NMI	TAL SPK
Dissolved	Filtration	FILTRATION			250 mL	250 mL	3243	09/01/15 09:08	JSP	TAL SPK
Dissolved	Prep	200.7			50 mL	50 mL	3251	09/01/15 10:10	JSP	TAL SPK
Dissolved	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	3275	09/02/15 11:42	JSP	TAL SPK
Total/NA	Analysis	SM 5310C		1	50 mL	50 mL	278419	09/01/15 11:44	JAB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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

Certification Summary

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

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	10-31-15
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C789	07-19-16

Method Summary

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1837-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SPK
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC/MS)	NWTPH	TAL SPK
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL SPK
RSK-175	Dissolved Gases (GC)	RSK	TAL NSH
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
200.7 Rev 4.4	Metals (ICP)	EPA	TAL SPK
SM 5310C	TOC	SM	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

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

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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: Justin Trice	Lab PM: Arrington, Randee E	Carrier Tracking No(s):	COC No: 590-683-227.1
Client Contact: Scott Lathen	Phone: 208-589-3384	E-Mail: randee.arrington@testamericainc.com		Page: Page 1 of 1
Company: GeoEngineers Inc				Job #:
Address: 523 East Second Ave	Due Date Requested:			
City: Spokane	TAT Requested (days): std			
State, Zip: WA, 99202				
Phone: 509-251-5239(Tel)	PO #: Purchase Order not required			
Email: slathen@geoengineers.com	WO #:			
Project Name: L&L Exxon	Project #: 59000435			
Site: Washington	SSOW#:			

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 - Na2S2SO3
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)	6310C - Total Organic Carbon (TOC)	RSK_175 - Methane	8270D_SIM - Naphthalenes	2320B, 300_ORGFM_28D, 300_ORGFMS	8260C_NWTPH_Gx_MS	NWTPH_Dx - NWTPH-Dx	200.7 - Dissolved Manganese	8260C - (MOD) BTEX + MTBE & Naphthalene	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	A	N	N	A	A	N	A		
MW-1-082415	8/24/15	1253	C	Water	N		X	X	X		X	X	X	X		
MW-2-082415		1206		Water	N											
MW-3-082415		1133		Water	N											
MW-4-082415		1003		Water	N											
MW-5-082415		1054		Water	N											
MW-DUP-082415		1200		Water	N											
Trip Blank				Water												
Temp Blank				Water												

590-1837 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.

	Date/Time	Company	Received by	Date/Time	Company
Relinquished by: Justin Trice	8/28/15 0940	Geo		8/28/15 9:40	TA Spok
Relinquished by:	Date/Time	Company	Received by	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 4.2°C IR01

9/8/2015

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-1837-1

Login Number: 1837
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	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
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.	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	

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-1837-1

Login Number: 1837
List Number: 2
Creator: McBride, Mike

List Source: TestAmerica Nashville
List Creation: 08/31/15 05:51 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
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.	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.	True	

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: 590-1808-1
Client Project/Site: L&L Exxon (0504-081-01)

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

Attn: Scott Lathen

Authorized for release by:
9/4/2015 9:48:32 AM

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

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Case Narrative

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

Job ID: 590-1808-1

Laboratory: TestAmerica Spokane

Narrative

Receipt
The samples were received on 8/25/2015 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.8º C.

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

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

Sample Summary

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-1808-1	MW-1-082415	Water	08/24/15 12:53	08/25/15 09:25
590-1808-2	MW-2-082415	Water	08/24/15 12:06	08/25/15 09:25
590-1808-3	MW-3-082415	Water	08/24/15 11:33	08/25/15 09:25
590-1808-4	MW-4-082415	Water	08/24/15 10:03	08/25/15 09:25
590-1808-5	MW-5-082415	Water	08/24/15 10:54	08/25/15 09:25
590-1808-6	MW-DUP-082415	Water	08/24/15 12:00	08/25/15 09:25

Definitions/Glossary

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

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: MW-1-082415

Lab Sample ID: 590-1808-1
Date Collected: 08/24/15 12:53
Matrix: Water
Date Received: 08/25/15 09:25

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20		mg/L			08/25/15 11:39	1
Sulfate	**11**		0.50		mg/L			08/25/15 11:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**580**		4.0		mg/L			09/03/15 13:14	1

Client Sample ID: MW-2-082415

Lab Sample ID: 590-1808-2
Date Collected: 08/24/15 12:06
Matrix: Water
Date Received: 08/25/15 09:25

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20		mg/L			08/25/15 11:54	1
Sulfate	**19**		0.50		mg/L			08/25/15 11:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**440**		4.0		mg/L			09/03/15 13:14	1

Client Sample ID: MW-3-082415

Lab Sample ID: 590-1808-3
Date Collected: 08/24/15 11:33
Matrix: Water
Date Received: 08/25/15 09:25

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**9.0**		0.20		mg/L			08/25/15 12:24	1
Sulfate	**43**	**F1**	0.50		mg/L			08/25/15 12:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**280**		4.0		mg/L			09/03/15 13:14	1

Client Sample ID: MW-4-082415

Lab Sample ID: 590-1808-4
Date Collected: 08/24/15 10:03
Matrix: Water
Date Received: 08/25/15 09:25

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**0.77**		0.20		mg/L			08/25/15 12:55	1
Sulfate	**46**		0.50		mg/L			08/25/15 12:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**460**		4.0		mg/L			09/03/15 13:14	1

Client Sample Results

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

Client Sample ID: MW-5-082415

Lab Sample ID: 590-1808-5

Date Collected: 08/24/15 10:54
Matrix: Water
Date Received: 08/25/15 09:25

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**5.4**		0.20		mg/L			08/25/15 15:13	1
Sulfate	**60**		0.50		mg/L			08/25/15 15:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**320**		4.0		mg/L			09/03/15 13:14	1

Client Sample ID: MW-DUP-082415

Lab Sample ID: 590-1808-6

Date Collected: 08/24/15 12:00
Matrix: Water
Date Received: 08/25/15 09:25

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20		mg/L			08/25/15 15:28	1
Sulfate	**12**		0.50		mg/L			08/25/15 15:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**570**		4.0		mg/L			09/03/15 13:14	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 590-3150/1013
Matrix: Water
Analysis Batch: 3150

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20		mg/L			08/25/15 13:55	1

Lab Sample ID: LCS 590-3150/1012
Matrix: Water
Analysis Batch: 3150

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate as N			5.00	4.95		mg/L		99	90 - 110		

Lab Sample ID: 590-1808-3 MS
Matrix: Water
Analysis Batch: 3150

Client Sample ID: MW-3-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate as N	9.0		4.55	13.1		mg/L		90	80 - 120		

Lab Sample ID: 590-1808-3 MSD
Matrix: Water
Analysis Batch: 3150

Client Sample ID: MW-3-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	9.0		4.55	13.1		mg/L		90	80 - 120	0	12.1

Lab Sample ID: 590-1808-3 DU
Matrix: Water
Analysis Batch: 3150

Client Sample ID: MW-3-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nitrate as N	9.0			8.98		mg/L				0.1	13.1

Lab Sample ID: MB 590-3151/1013
Matrix: Water
Analysis Batch: 3151

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50		mg/L			08/25/15 13:55	1

Lab Sample ID: LCS 590-3151/1012
Matrix: Water
Analysis Batch: 3151

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			12.5	12.4		mg/L		99	90 - 110		

Lab Sample ID: 590-1808-3 MS
Matrix: Water
Analysis Batch: 3151

Client Sample ID: MW-3-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	43	F1	11.4	51.1	F1	mg/L		67	80 - 120		

Lab Sample ID: 590-1808-3 MSD
Matrix: Water
Analysis Batch: 3151

Client Sample ID: MW-3-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	43	F1	11.4	51.1	F1	mg/L		67	80 - 120	0	10

Lab Sample ID: 590-1808-3 DU
Matrix: Water
Analysis Batch: 3151

Client Sample ID: MW-3-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Sulfate	43	F1		43.5		mg/L				0	15.7

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 590-3287/1
Matrix: Water
Analysis Batch: 3287

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		4.0		mg/L			09/03/15 13:14	1

Lab Sample ID: LCS 590-3287/2
Matrix: Water
Analysis Batch: 3287

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity			500	470		mg/L		94	90 - 110		

Lab Sample ID: 590-1808-1 DU
Matrix: Water
Analysis Batch: 3287

Client Sample ID: MW-1-082415
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	580			595		mg/L				3	10

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

Client Sample ID: MW-1-082415
Date Collected: 08/24/15 12:53
Date Received: 08/25/15 09:25

Lab Sample ID: 590-1808-1
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	300.0		1	5 mL		3150	08/25/15 11:39	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		3151	08/25/15 11:39	MRS	TAL SPK
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	3287	09/03/15 13:14	JSP	TAL SPK

Client Sample ID: MW-2-082415
Date Collected: 08/24/15 12:06
Date Received: 08/25/15 09:25

Lab Sample ID: 590-1808-2
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	300.0		1	5 mL		3150	08/25/15 11:54	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		3151	08/25/15 11:54	MRS	TAL SPK
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	3287	09/03/15 13:14	JSP	TAL SPK

Client Sample ID: MW-3-082415
Date Collected: 08/24/15 11:33
Date Received: 08/25/15 09:25

Lab Sample ID: 590-1808-3
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	300.0		1	5 mL		3150	08/25/15 12:24	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		3151	08/25/15 12:24	MRS	TAL SPK
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	3287	09/03/15 13:14	JSP	TAL SPK

Client Sample ID: MW-4-082415
Date Collected: 08/24/15 10:03
Date Received: 08/25/15 09:25

Lab Sample ID: 590-1808-4
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	300.0		1	5 mL		3150	08/25/15 12:55	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		3151	08/25/15 12:55	MRS	TAL SPK
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	3287	09/03/15 13:14	JSP	TAL SPK

Client Sample ID: MW-5-082415
Date Collected: 08/24/15 10:54
Date Received: 08/25/15 09:25

Lab Sample ID: 590-1808-5
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	300.0		1	5 mL		3150	08/25/15 15:13	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		3151	08/25/15 15:13	MRS	TAL SPK
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	3287	09/03/15 13:14	JSP	TAL SPK

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

Client Sample ID: MW-DUP-082415
Date Collected: 08/24/15 12:00
Date Received: 08/25/15 09:25

Lab Sample ID: 590-1808-6
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	300.0		1	5 mL		3150	08/25/15 15:28	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		3151	08/25/15 15:28	MRS	TAL SPK
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	3287	09/03/15 13:14	JSP	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: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

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	10-31-15
Washington	State Program	10	C569	01-06-16

Method Summary

Client: GeoEngineers Inc
Project/Site: L&L Exxon (0504-081-01)

TestAmerica Job ID: 590-1808-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL SPK
SM 2320B	Alkalinity	SM	TAL SPK

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11922 E. First Ave., Spokane WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave., Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

9/4/2015

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: GeoEngineers

REPORT TO: Scott Lathen slathen@geoengineers.com

ADDRESS: 523 E Second Ave Spokane WA 99202

PHONE: 509-363-3125 FAX: 509-363-3126

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: L&L Exxon

PROJECT NUMBER: 0504-081-01

SAMPLED BY: JWR

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: ~~10~~ STD | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Nitrate	Sulfate	Alkalinity	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	MW-1-082415	8/24/15 1253	X	X	X	W	1		
2	MW-2-082415	1206							
3	MW-3-082415	1133							
4	MW-4-082415	1003							
5	MW-5-082415	1054							
6	MW-DUP-082415	1200							
7									
8									
9									
10									

RELEASED BY: JR
PRINT NAME: Justin Rice FIRM: Geo DATE: 8/24/15 TIME: 1355

RECEIVED BY: Danielle Armenta
PRINT NAME: Danielle Armenta FIRM: TestAmerica DATE: 8/25/15 TIME: 0925

RELEASED BY:
PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS

TEMP: 2.8C

PAGE 1 OF 1

Iced

TAL-1000 (0714)

590-1808 Chain of Custody

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-1808-1

Login Number: 1808
List Number: 1
Creator: Arrington, Randee E

List Source: TestAmerica Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
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.	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	

TestAmerica

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ANALYTICAL REPORT

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

TestAmerica Job ID: 590-1339-1
Client Project/Site: L&L Exxon

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

Attn: Scott Lathen

Authorized for release by:
7/21/2015 3:38:54 PM

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

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Case Narrative

Client: GeoEngineers Inc
Project/Site: L&L Exxon

TestAmerica Job ID: 590-1339-1

Job ID: 590-1339-1

Laboratory: TestAmerica Spokane

Narrative

Receipt
The sample was received on 7/9/2015 3:27 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 6.4º C.

Receipt Exceptions

The following sample was received at the laboratory outside the required temperature criteria: EX-SW-1(2-3) (590-1339-1). The client was contacted regarding this issue via the Sample Receipt Confirmation email.

GC/MS VOA
Method 8260C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with analytical batch 490-265063.

Method 8260C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with analytical batch 490-265427.

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

GC 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: L&L Exxon

TestAmerica Job ID: 590-1339-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-1339-1	EX-SW-1(2-3)	Solid	07/08/15 09:40	07/09/15 15:27

Client: GeoEngineers Inc
Project/Site: L&L Exxon

TestAmerica Job ID: 590-1339-1

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: EX-SW-1(2-3)
Date Collected: 07/08/15 09:40
Date Received: 07/09/15 15:27

Lab Sample ID: 590-1339-1
Matrix: Solid
Percent Solids: 89.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.8		mg/Kg	☼	07/08/15 09:40	07/16/15 02:49	20
Ethylbenzene	ND		1.8		mg/Kg	☼	07/08/15 09:40	07/16/15 02:49	20
Toluene	ND		1.8		mg/Kg	☼	07/08/15 09:40	07/16/15 02:49	20
Xylenes, Total	**450**		23		mg/Kg	☼	07/08/15 09:40	07/17/15 00:42	100
m-Xylene & p-Xylene	**250**		14		mg/Kg	☼	07/08/15 09:40	07/17/15 00:42	100
o-Xylene	**200**		9.1		mg/Kg	☼	07/08/15 09:40	07/17/15 00:42	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*	*07/08/15 09:40*	*07/16/15 02:49*	*20*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*	*07/08/15 09:40*	*07/17/15 00:42*	*100*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*	*07/08/15 09:40*	*07/16/15 02:49*	*20*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*	*07/08/15 09:40*	*07/17/15 00:42*	*100*
Dibromofluoromethane (Surr)	*98*		*70 - 130*	*07/08/15 09:40*	*07/16/15 02:49*	*20*
Dibromofluoromethane (Surr)	*98*		*70 - 130*	*07/08/15 09:40*	*07/17/15 00:42*	*100*
Toluene-d8 (Surr)	*94*		*70 - 130*	*07/08/15 09:40*	*07/16/15 02:49*	*20*
Toluene-d8 (Surr)	*95*		*70 - 130*	*07/08/15 09:40*	*07/17/15 00:42*	*100*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C12	**17000**		55		mg/Kg	☼	07/08/15 09:40	07/16/15 03:07	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*63*		*50 - 150*	*07/08/15 09:40*	*07/16/15 03:07*	*10*

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 490-265063/8
Matrix: Solid
Analysis Batch: 265063

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.10		mg/Kg			07/15/15 18:18	1
Ethylbenzene	ND		0.10		mg/Kg			07/15/15 18:18	1
Toluene	ND		0.10		mg/Kg			07/15/15 18:18	1
Xylenes, Total	ND		0.25		mg/Kg			07/15/15 18:18	1
m-Xylene & p-Xylene	ND		0.15		mg/Kg			07/15/15 18:18	1
o-Xylene	ND		0.10		mg/Kg			07/15/15 18:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*07/15/15 18:18*	*1*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*07/15/15 18:18*	*1*
Dibromofluoromethane (Surr)	*98*		*70 - 130*		*07/15/15 18:18*	*1*
Toluene-d8 (Surr)	*96*		*70 - 130*		*07/15/15 18:18*	*1*

Lab Sample ID: LCS 490-265063/5
Matrix: Solid
Analysis Batch: 265063

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			2.50	2.02		mg/Kg		81	75 - 127		
Ethylbenzene			2.50	2.27		mg/Kg		91	80 - 134		
Toluene			2.50	2.23		mg/Kg		89	80 - 132		
m-Xylene & p-Xylene			5.00	4.52		mg/Kg		90	80 - 137		
o-Xylene			2.50	2.25		mg/Kg		90	80 - 141		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 130*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*
Dibromofluoromethane (Surr)	*98*		*70 - 130*
Toluene-d8 (Surr)	*95*		*70 - 130*

Lab Sample ID: LCSD 490-265063/6
Matrix: Solid
Analysis Batch: 265063

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			2.50	1.95		mg/Kg		78	75 - 127	4	50
Ethylbenzene			2.50	2.18		mg/Kg		87	80 - 134	4	50
Toluene			2.50	2.12		mg/Kg		85	80 - 132	5	50
m-Xylene & p-Xylene			5.00	4.33		mg/Kg		87	80 - 137	4	50
o-Xylene			2.50	2.17		mg/Kg		87	80 - 141	4	50

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*
4-Bromofluorobenzene (Surr)	*98*		*70 - 130*
Dibromofluoromethane (Surr)	*99*		*70 - 130*
Toluene-d8 (Surr)	*94*		*70 - 130*

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

Lab Sample ID: MB 490-265427/8
Matrix: Solid
Analysis Batch: 265427

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.10		mg/Kg			07/16/15 16:39	1
Ethylbenzene	ND		0.10		mg/Kg			07/16/15 16:39	1
Toluene	ND		0.10		mg/Kg			07/16/15 16:39	1
Xylenes, Total	ND		0.25		mg/Kg			07/16/15 16:39	1
m-Xylene & p-Xylene	ND		0.15		mg/Kg			07/16/15 16:39	1
o-Xylene	ND		0.10		mg/Kg			07/16/15 16:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*		*07/16/15 16:39*	*1*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*07/16/15 16:39*	*1*
Dibromofluoromethane (Surr)	*96*		*70 - 130*		*07/16/15 16:39*	*1*
Toluene-d8 (Surr)	*96*		*70 - 130*		*07/16/15 16:39*	*1*

Lab Sample ID: LCS 490-265427/5
Matrix: Solid
Analysis Batch: 265427

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			2.50	1.94		mg/Kg		77	75 - 127		
Ethylbenzene			2.50	2.18		mg/Kg		87	80 - 134		
Toluene			2.50	2.15		mg/Kg		86	80 - 132		
m-Xylene & p-Xylene			5.00	4.30		mg/Kg		86	80 - 137		
o-Xylene			2.50	2.14		mg/Kg		86	80 - 141		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*
Dibromofluoromethane (Surr)	*98*		*70 - 130*
Toluene-d8 (Surr)	*96*		*70 - 130*

Lab Sample ID: LCSD 490-265427/6
Matrix: Solid
Analysis Batch: 265427

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			2.50	1.97		mg/Kg		79	75 - 127	2	50
Ethylbenzene			2.50	2.19		mg/Kg		88	80 - 134	1	50
Toluene			2.50	2.14		mg/Kg		86	80 - 132	1	50
m-Xylene & p-Xylene			5.00	4.33		mg/Kg		87	80 - 137	1	50
o-Xylene			2.50	2.19		mg/Kg		88	80 - 141	2	50

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 130*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*
Dibromofluoromethane (Surr)	*97*		*70 - 130*
Toluene-d8 (Surr)	*93*		*70 - 130*

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

Lab Sample ID: MB 490-265068/13
Matrix: Solid
Analysis Batch: 265068

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C12	ND		5.0		mg/Kg			07/15/15 22:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene	*60*		*50 - 150*		*07/15/15 22:09*	*1*

Lab Sample ID: LCS 490-265068/12
Matrix: Solid
Analysis Batch: 265068

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			10.0	10.6		mg/Kg		106	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene	*77*		*50 - 150*

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: L&L Exxon

TestAmerica Job ID: 590-1339-1

Client Sample ID: EX-SW-1(2-3)
Date Collected: 07/08/15 09:40
Date Received: 07/09/15 15:27

Lab Sample ID: 590-1339-1
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			263961	07/11/15 13:23	MAA	TAL NSH

Client Sample ID: EX-SW-1(2-3)
Date Collected: 07/08/15 09:40
Date Received: 07/09/15 15:27

Lab Sample ID: 590-1339-1
Matrix: Solid
Percent Solids: 89.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.963 g	5.0 mL	264119	07/08/15 09:40	JLP	TAL NSH
Total/NA	Analysis	8260C		20	6.963 g	5.0 mL	265063	07/16/15 02:49	NC	TAL NSH
Total/NA	Prep	5035			6.963 g	5.0 mL	264119	07/08/15 09:40	JLP	TAL NSH
Total/NA	Analysis	8260C		100	6.963 g	5.0 mL	265427	07/17/15 00:42	AK1	TAL NSH
Total/NA	Prep	5035			5.663 g	5.0 mL	264119	07/08/15 09:40	JLP	TAL NSH
Total/NA	Analysis	NWTPH-Gx		10	5.663 g	5.0 mL	265068	07/16/15 03:07	AMC	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: GeoEngineers Inc
Project/Site: L&L Exxon

TestAmerica Job ID: 590-1339-1

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	10-31-15
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Nashville

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C789	07-19-15 *

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
8260C	5035	Solid	Benzene
8260C	5035	Solid	Ethylbenzene
8260C	5035	Solid	m-Xylene & p-Xylene
8260C	5035	Solid	o-Xylene
8260C	5035	Solid	Toluene
8260C	5035	Solid	Xylenes, Total
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

* Certification renewal pending - certification considered valid.

Method Summary

Client: GeoEngineers Inc
Project/Site: L&L Exxon

TestAmerica Job ID: 590-1339-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL NSH
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC)	NWTPH	TAL NSH
Moisture	Percent Moisture	EPA	TAL NSH

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 NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11922 E. First Ave., Spokane WA 99206-5302 509-924-9200 FAX 924-9290 ☒
9405 SW Nimbus Ave., Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210 ☐
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210 ☐

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: GeoEngineers, Inc.

REPORT TO: slatham@geoengineers.com

ADDRESS: 523 E. Second Ave
Spokane, WA 99202

PHONE: 509-363-3125 FAX: 509-363-3126

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: L+L Exxon

PROJECT NUMBER: 0504-081-01

SAMPLED BY: JML

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: ☒ 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: ☒ 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	REQUESTED ANALYSES: NWTPH-Gx	REQUESTED ANALYSES: BTEX	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	EX-SW-1(2-3)	7/8/2015 0940		X	X	S	3		
2									
3									
4									
5									
6									
7									
8									
9									
10									

RELEASED BY: [signature] DATE: 7-9-2015
PRINT NAME: Josh Lu FIRM: GET TIME: 1524

RECEIVED BY: [signature] DATE 7/9/15
PRINT NAME: Sheila Kraft FIRM: TA SPOK TIME: 15:27

RELEASED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT TIME:

ADDITIONAL REMARKS.

TEMP: 16.4 °C PAGE 1 OF 1

IR001

590-1339 Chain of Custody

TAL-1000 (0714)

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7/21/2015

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-1339-1

Login Number: 1339
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	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
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.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 590-1339-1

Login Number: 1339
List Number: 2
Creator: Buckingham, Paul

List Source: TestAmerica Nashville
List Creation: 07/11/15 03:47 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
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.	False	
Cooler Temperature is acceptable.	False	
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.	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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX D
Report Limitations and Guidelines for Use

APPENDIX D
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 use by 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 Ecology's L&L Exxon property in Richland, 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

If a lending agency or other parties intend to place legal reliance on the product of our services, we require that those parties indicate in writing their acknowledgement that the scope of services provided, and the general conditions under which the services were rendered including the limitation of professional liability, are understood and accepted by them. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

[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 reproduction is acceptable, but recognizes 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.

Have we delivered World Class Client Service?

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

GeoEngineers