

December 7, 2016

Acorn Development, LLC
c/o Seneca Group
1191 Second Avenue, Suite 1500
Seattle, Washington 98101

Attention: Rishi Beri

Subject: Supplemental Environmental Services Summary
Block 20, Denny Triangle
Seattle, Washington
File No. 20434-001-24

INTRODUCTION AND BACKGROUND

This letter summarizes the results of our supplemental subsurface characterization activities completed at the Block 20 redevelopment project site in the Denny Triangle neighborhood of downtown Seattle, Washington (“subject property”). Environmental studies were completed on Block 20 to evaluate potential sources of contamination, and to characterize soil and groundwater beneath the subject property. Investigations completed by GeoEngineers include:

- Phase I Environmental Site Assessment (ESA) dated June 7, 2012 which summarized historical property uses; and,
- Phase II ESA dated June 7, 2012 which summarizes soil and groundwater sampling activities completed in 2012.

The Phase II investigation completed in 2012 included the installation of six groundwater monitoring wells (MW20-1 through MW20-6), and 18 borings (B20-1 through B20-18) in February and April of 2012, as shown on the attached Figure 1. Soil and groundwater from these sampling events were tested for one or more of the following contaminants of concern: petroleum hydrocarbons (gasoline, diesel and heavy oil range), PCBs, PAHs, VOCs, and total metals. Chemical analytical data from analyzed soil and groundwater samples identified the following:

- Heavy oil-range petroleum hydrocarbons, lead, and carcinogenic PAHs were detected at concentrations greater than the Washington State Department of Ecology Model Toxics Control Act (MTCA) Method A cleanup levels in soil samples obtained from five borings;
- Gasoline-, diesel-, and heavy oil-range petroleum hydrocarbons, metals, and PAHs were detected in soil from five borings at concentrations less than the MTCA Method A cleanup levels; and,



- Contaminants of concern were not detected in groundwater samples obtained from the groundwater monitoring wells on Block 20.

Because of the significant amount of fill on this block and the identified contamination in soil, further study was warranted to fully characterize the extent of the contamination; this resulted in the exploration and testing program completed in April 2015, and summarized below.

SUPPLEMENTAL SUBSURFACE CHARACTERIZATION

Subsurface Explorations and Soil Sampling

Twelve direct-push borings (B20-21 through B20-32) were completed on April 15 and 16, 2015 using direct push drilling methods, operated by Cascade Drilling (Cascade) of Woodinville, Washington. Subsurface conditions are described in the attached boring logs (Figures A-1 through A-16). The borings ranged in depth between approximately eight and 25 feet below ground surface (bgs). Discrete soil samples were obtained from the continuous-core borings for field screening and possible chemical analytical testing. Field screening consisted of headspace vapor and water sheen screening methods. The borings were located in areas where previous explorations had not been completed in order to characterize the extent of the contamination laterally or in the vicinity of previous borings where the extent of the contamination was not characterized vertically. The approximate exploration locations are shown in the attached Figure 1: Boring Locations and Soil Chemical Analytical Results.

Seventeen discrete soil samples obtained from the borings were submitted to Fremont Analytical (Fremont) in Seattle, Washington for chemical analysis of one or more of the following:

- Gasoline-range hydrocarbons by Northwest Method NWTPH-Gx;
- Diesel- and heavy oil-range hydrocarbons by Northwest Method NWTPH-Dx with silica gel cleanup;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C SIM;
- Volatile organic compounds (VOCs), including petroleum related VOCs: benzene (B), ethylbenzene (E), toluene (T) and total xylenes (X) by EPA Method 8260B; and,
- Total metals by EPA Method 6020 and 7471, and Toxic Characteristic Leaching Procedure (TCLP) by EPA Methods SW7470 and 1311.

Soil samples were selected for chemical analysis based on field screening indications of petroleum contamination, the depth of the soil sample relative to observed potentially contaminated soil in adjacent borings and the observed depth relative to perched groundwater at the site. Tables 1 and 2 summarize the attached chemical analytical data.

Chemical Analytical Results

Chemical analytical data from analyzed soil samples identified the following:

- Heavy oil-range petroleum hydrocarbons were detected at concentrations greater than MTCA Method A cleanup levels in soil obtained from one boring (B20-21); and



- Gasoline- and heavy oil-range petroleum hydrocarbons, lead, chromium, PAHs, and VOCs were detected in seven additional borings at concentrations less than the MTCA Method A cleanup levels.

CONSTRUCTION-PHASE SITE CHARACTERIZATION

Soldier Pile Installation Discoveries

During soldier pile drilling and installation, GeoEngineers observed field screening evidence of contamination in soil cuttings from soldier pile shaft W9. Soil was stockpiled onsite, and sample W9-SP-25 was obtained and submitted to Fremont Analytical on October 4, 2016 for chemical analysis of the following contaminants of concern: petroleum hydrocarbons, PAHs, VOCs, and total metals. Chemical analytical data from the analyzed soil sample identified the following:

- Total carcinogenic PAHs (cPAHs) were detected at concentrations greater than the MTCA Method A cleanup level; and,
- Gasoline-range petroleum hydrocarbons, and VOCs were detected at concentrations less than the MTCA Method A cleanup levels.

Between October 7, and October 11, 2016, additional sampling was conducted in adjacent soldier pile shafts W6 and W10, and borings W6S46 and W9S46 were completed to assess the horizontal and vertical extents of the contamination. Soil samples were submitted to Fremont Analytical for chemical analysis of petroleum hydrocarbons, PAHs, VOCs, and total metals. Chemical analytical data from the analyzed soil samples identified the following:

- Arsenic, Barium, and/or Chromium were detected above natural background concentrations for Puget Sound, but less than the MTCA Method A cleanup levels in soil obtained from shafts W6 and W10, and borings W6S46 and W9S46. Other contaminants of concern were not detected.

Soil represented by sample W9-SP-25 (approximately 70 tons) was transported to Waste Management for permitted disposal.

Characterization Soil Sampling for Disposal

One boring and five test pits were completed between September 30, and November 21, 2016 to characterize fill soil on the south half of the property for permitted disposal.

Seven discrete soil samples obtained from the explorations were submitted to Fremont Analytical (Fremont) in Seattle, Washington for chemical analysis of one or more of the following: petroleum hydrocarbons, PAHs, PCBs, VOCs, and total metals. Chemical analytical data from the analyzed soil sample identified the following:

- Carcinogenic PAHs were detected at concentrations greater than the MTCA Method A cleanup level in samples from test pits TP-W3S5 and TP-W14S9.
- Total cadmium and lead were detected at concentrations greater than the MTCA Method A cleanup level in the soil sample from TP-W14S9. Follow up TCLP analysis is pending laboratory QA/QC finalization, to determine recommended end use/handling requirements.



- Total arsenic, barium, chromium and mercury were detected at concentrations greater than the Puget Sound naturally occurring background concentrations in soil samples from fill soil in test pits TP-W3S5, TP-W4S20, TP-W4S35, TP-W14S9 and TP-W14S36.

Remedial Excavations and Confirmation Soil Sampling

Subsurface investigations completed by GeoEngineers in 2012 through 2015 identified two areas on the south half of the property that required separate soil handling and end-use requirements. These areas include:

- Lead-contaminated soil identified in vicinity of boring B20-13. Lead was detected at a concentration of 421 mg/kg which is greater than the MTCA Method A cleanup level of 250 mg/kg. Waste Management was selected as the disposal facility for soil excavated from this area.
- Heavy oil-impacted soil identified in vicinity of boring MW20-2. Heavy oil was detected at a concentration of 66.3 mg/kg which is less than the MTCA Method A cleanup level of 2,000 mg/kg. Soil from this area was characterized for permitted disposal as Class 2 soil at CEMEX.

Prior to construction mass excavation of soil on the south half of the property, GeoEngineers and Northwest Construction Inc. (Northwest, earthworks contractor) completed remedial excavations and subsequent confirmation sampling in these areas on November 14 and 15, 2016. The excavations are described separately below.

Lead-Contaminated Area

Approximately 1,300 tons of soil was excavated and transported to Waste Management for permitted disposal. Four soil samples were collected from the sidewalls of the excavation area, and submitted to Fremont Analytical for chemical analysis of lead. Chemical analytical data from the analyzed soil samples identified the following:

- Lead was detected above natural background concentrations for Puget Sound, but less than the MTCA Method A cleanup levels in soil samples D-W3S30-4.5, D-W3S25-4.5, and D-W6S27-4.5.

Heavy Oil-Impacted Area

Approximately 1,500 tons of soil was excavated and transported to CEMEX for permitted disposal as Class 2 soil. Five soil samples were collected from the sidewalls and the base of the excavation area, and submitted to Fremont Analytical for chemical analysis of diesel- and heavy oil-range petroleum hydrocarbons. Diesel and heavy-oil range petroleum hydrocarbons were not detected in the five confirmation soil samples.

ROUGH ORDER OF MAGNITUDE REMEDIAL COST ESTIMATE

As part of this study, GeoEngineers was requested to provide an update to the rough order of magnitude (ROM) remedial cost estimate presented in our April 30, 2012 letter titled, "Environmental Site Characterization Summary and Rough Order of Magnitude Remedial Cost Estimate" based on the results of the April 2012 exploration and testing program. The use of this ROM remedial cost estimate is twofold: 1) to evaluate the potential environmental impact and remedial cost at the subject property (Block 20) and, 2) to facilitate a dialogue between the property owner and seller regarding responsibility for managing and



paying for environmental costs related to property redevelopment. Because the largest cost delta for environmental issues (“incremental environmental cost”) during a development of this scale is managing soil export, the remedial costs shown below are based on this key assumption. Additionally, because data indicates that groundwater has not been impacted by past uses, it is assumed that no cleanup action or special management or treatment is needed for groundwater. Based on this study and these objectives, GeoEngineers divided the subject property into three groups, listed below in order of decreasing effort and cost for soil end use:

1. Areas with identified, or previously known, contaminated soil that exceeds the Model Toxics Control Act (MTCA) cleanup levels; this category requires regulatory involvement and reporting;
2. Fill with contaminants of concern detected less than MTCA cleanup levels and/or above natural background levels, generally contains some brick, concrete and/or wood debris and, based on our historical research, most likely consists of undocumented, imported fill. This fill may pose an environmental risk during development from the perspective of end use and/or disposition of this fill; this category is a construction management and disposal issue but does not require regulatory involvement or reporting; and,
3. Fill with contaminants of concern not detected and similar to background levels, does not contain brick, concrete and/or wood debris and was most likely placed during the Denny Hill regrade (does not consist of undocumented, imported fill). This fill likely will not pose an environmental risk during development from the perspective of end use and/or disposition of this fill; this category is assumed to represent soil that can be managed under routine construction methods for an uncontaminated development project. However, caution should be used to assure that recipients of this soil will accept it based on their review of existing chemical analytical results. We also note that it is possible that isolated location of undocumented, imported fill exists in these areas in locations of utility trenches or other construction that has taken place since the Denny Hill Regrade activities.

In order to derive soil volumes, these three areas of soil are shown graphically on Figure 2, represented by red, blue, yellow and green outlines. Additional assumptions and notes regarding how to use this ROM remedial cost estimate are as follows:

- Remedial cost is defined narrowly as the additional cost (or cost delta) necessary for the disposal of impacted or contaminated soil at a permitted landfill. For purposes of this ROM cost estimate, we have assumed that soil considered “clean” will be excavated and handled during construction and will not add any additional disposal or handling costs to the project. “Clean” is defined as soil that does not contain contaminants of concern exceeding background concentrations, would meet the intent of the Solid Waste Rules and could be transported to any off-property receiving site.
- It is assumed that all other construction activities will proceed in a manner consistent with typical construction practices and that no environmental cost premium would be needed except for the soil handling issue outlined in bullet one.
- It is assumed that groundwater is not impacted at levels that exceed typical discharge criteria and no special handling is necessary.
- It is assumed that construction shoring will be installed to facilitate construction and that excavation, soil management and transportation will be completed as part of the redevelopment project.



- Based on the characterization data from this study, native soil will be considered “clean” with the exception of the point sources identified on Block 20.
- Because of the additional Denny Regrade fill history and geologic understanding gained during the redevelopment of Blocks 14 and 19, we have divided fill into two categories: 1) fill that likely was placed as part of the Denny Hill removal (this fill was from this local, native, source and appears un-impacted) and 2) fill that likely was placed after Denny Hill removal as part of the larger Regrade project and may have resulted in import of undocumented fill from unknown sources. It appears that this undocumented fill was concentrated primarily on Block 20. Therefore, for the purpose of this ROM cost estimate we assume that the Denny Hill native fill is “clean” and the undocumented fill with bricks and wood debris is “impacted or contaminated (based on chemical analytical testing.”
- Related to the undocumented fill observed on the subject property, it is assumed that solid waste regulations apply, thus limiting the end use disposition of this soil. Therefore, the ROM cost estimate assumes the following related to undocumented fill:
 - For the purpose of this ROM cost estimate and based on the chemical analytical results and our observations, contaminants of concern were detected and brick and wood fragments are present in fill soil that was brought to the site during after the Denny Hill removal as part of the larger Regrade activities. This soil will be considered “suspect” or “impacted” requiring special handling and disposal. For example, soil categorized as “impacted” could be transported to CEMEX’ permitted treatment and disposal site in Everett, Washington as a Class II soil (as defined by their permit). For the purposes of this ROM cost estimate we have used a disposal fee of \$18/ton for this soil. “Impacted” fill soil is colored yellow on Figure 2.
 - For the purpose of this ROM cost estimate and based on the chemical analytical results and our observations, contaminants of concern were not detected and large concentrations of debris has not been observed in fill soil on Block 20. This soil will be considered “clean” and does not require special handling and disposal. For the purposes of the ROM cost estimate, we have assumed that the handling and disposal of this soil will add no additional costs to the project. “Clean” fill soil is colored green on Figure 2.
 - Fill soil that contains contaminants of concern at concentrations greater than MTCA cleanup levels will require disposal at a subtitle D landfill (for example Waste Management’s facilities) or Cemex’ permitted treatment and disposal site in Everett, Washington as a Class III soil (as defined by their permit). For the purposes of this ROM cost estimate we have used a disposal fee of \$43/ton for this soil. “Contaminated” fill soil is colored blue on Figure 2 (north half of Block 20), with the exception of areas of elevated lead contamination colored in red. Elevated lead contaminated soil is not acceptable for disposal at Cemex and must be disposed of by Waste Management.
- It is assumed that up to 50 confirmation soil samples will be submitted for chemical analysis of gasoline-, heavy oil- and lube oil range petroleum hydrocarbons, PAHs, and RCRA 8 metals on a rush turnaround time from the blue areas and the cost per sample is approximately \$800. It is also assumed that up to 50 waste characterization soil samples will be submitted for chemical analysis of gasoline-, heavy oil- and lube oil range petroleum hydrocarbons and RCRA 8 metals on a rush turnaround time from the fill soil removed from the yellow areas and the cost per sample is approximately \$500 per sample.



- Estimated engineering costs are based on approximately 7-15 percent of total soil disposal costs, which is consistent with other projects in downtown Seattle.
- Estimated regulatory costs assume Ecology’s Voluntary Cleanup Program (VCP) fees over an approximately 6 to 12 month time period.

UPDATED ROM REMEDIAL COST ESTIMATE

Soil Disposal Estimated Cost								
Blocks	Subarea Explanation	Length (ft)	Width (ft)	Depth (ft)	Cubic Yards	Tons	Disposal Cost/ton	Estimated Cost (\$)
Block 20	Red areas	35	30	10	390	700	\$43.00	\$202,100
		70	40	7	725	1,300		
		30	45	15	750	1,350		
		30	45	15	750	1,350		
	Blue areas	360	125	19	31,700	57,000	\$43.00	\$2,513,995
		35	15	20	390	700		
		45	30	8.5	425	765		
	Yellow areas	45	25	15	1,600	2,880	\$18.00	\$80,100
		35	35	7	315	570		
		45	35	9.5	550	1,000		
SubTotal Soil Disposal						\$2,796,195		
Professional Services								
Estimated Chemical Analytical Costs						\$50,000 - 100,000		
Estimated Engineering Costs						\$235,000 - 500,000		
Estimated Regulatory Costs						\$10,000 - 30,000		
SubTotal Professional						\$295,000 - 630,000		
TOTAL FOR SOIL DISPOSAL AND PROFESSIONAL SERVICES							\$3,091,195 – 3,426,195	




CONCLUSIONS

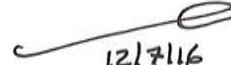
Following the 12 supplemental subsurface explorations completed in 2015, Soil Management Categories were refined from the categories identified in the Phase II investigation in 2012. Based on prior project experiences (Blocks 14 and 19), lateral and vertical characterization of contaminants of concern previously identified in the 2012 explorations and following the completion of the five additional test pit characterization soil samples, GeoEngineers revised the Soil Management Categories figure (Figure 2). Soil south of the alley was identified as "clean," with the exception of the six localized areas identified as yellow, blue and red.


GeoEngineers environmental staff will be present during excavation activities to observe the soil being excavated in this area to provide additional characterization sampling, as needed. The Environmental Construction Contingency Plan will be revised as new data becomes available.

Sincerely,
GeoEngineers, Inc.


Christopher Brown
Project Manager

SJB:CTB:TNO:lw


1217116
Tony Orme, PE
Associate



Attachments:

Table 1. Soil Field Screening and Chemical Analytical Data (Petroleum Hydrocarbons, PCBs and Metals)

Table 2. Soil Chemical Analytical Data (PAHs and VOCs)

Figure 1. Boring Locations and Soil Chemical Analytical Results

Figure 2. Soil Management Categories

Boring Logs. Figures A-1 through A-16

Chemical Analytical Data

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

Table 1
Soil Field Screening and Chemical Analytical Data (Petroleum Hydrocarbons, PCBs and Metals)
Project Rufus 2.0
Block 20, Denny Triangle, Seattle, Washington
GeoEngineers File No. 20434-001-24

Exploration Location ¹	Sample ID	Depth (feet bgs)	Location of Sample Relative to Fill/Native Soil and Groundwater	Field Screening ²		Petroleum Hydrocarbons (mg/kg)			PCBs (mg/kg)	RCRA 8 Metals ⁵ (mg/kg)							
				Sheen	Headspace (ppm)	Gasoline Range ³	Diesel Range ⁴	Heavy Oil Range ⁴		Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury
Direct Push Borings Completed April 15-16, 2015																	
B20-21	B-20-21-10.5	10.5	Fill	hs	>1,000	60.7	<26.3	8,120	--	4.85	--	0.603	32.4	155⁶	--	--	<0.289 ⁷
	B-20-21-13.0	13	Native	ns	<1	9.36	<25.1	1,170	--	--	--	--	--	--	--	--	--
B20-22	B-20-22-7.5	7.5	Fill	ns	<1	--	<22.3	<55.7	--	--	--	--	--	--	--	--	--
B20-23	B-20-23-3.0	3	Fill	ms	75	<7.55	<19.6	934	--	3.67	--	<0.171	38.2	9.82	--	--	<0.274
B20-24	B-20-24-3.5	3.5	Fill	ns	<1	<5.21	<22.4	<55.9	--	14.7	--	0.853	37.8	216	--	--	0.452
	B-20-24-8.5	8.5	Native	ns	<1	<3.49	<26.6	<66.6	--	5.68	--	<0.210	49.6	3.71	--	--	<0.333
B20-25	B-20-25-2.0	2	Fill	ms	25	<2.76	<20.8	1,510	--	2.34	--	<0.158	30.7	7.94	--	--	<0.253
	B-20-25-12.5	12.5	Fill	ns	<1	--	<20.3	<50.7	--	--	--	--	--	--	--	--	--
B20-26	B-20-26-3.5	3.5	Fill	ns	<1	<2.46	<22.2	<55.6	--	6.65	--	<0.181	44.4	3.81	--	--	<0.277
B20-27	B-20-27-5.0	5	Fill	ns	<1	<4.53	<20.5	226	--	--	--	--	--	--	--	--	--
	B-20-27-17.5	17.5	Fill	ns	<1	<4.22	<18.7	<46.6	--	--	--	--	--	--	--	--	--
B20-28	B-20-28-6.0	6	Fill	ns	<1	--	--	--	--	--	--	--	--	94.5⁶	--	--	--
	B-20-28-8.5	8.5	Fill	ns	<1	--	--	--	--	--	--	--	--	10.2 ⁶	--	--	--
B20-29	B-20-29-8.5	8.5	Native	ns	<1	--	--	--	--	--	--	--	--	8.32	--	--	--
B20-30	B-20-30-8.5	8.5	Native	ns	<1	--	--	--	--	--	--	--	--	5.71	--	--	--
B20-31	B-20-31-8.0	8	Fill	ns	<1	--	--	--	--	--	--	--	--	26.5	--	--	--
B20-32	B-20-32-8.5	8.5	Fill	ns	<1	--	--	--	--	--	--	--	--	6.65	--	--	--
Construction Phase Sampling Completed September 30 through November 21, 2016																	
TB-W14S15	SC-1-5.0	5	Fill	ss	<1	<4.57	<22.6	<56.4	<0.111	10.4	131	<0.190	57.2	19.4	1.81	<0.0950	<0.297
	SC-2-15.0	15	Native	ns	<1	<5.82	<56.4	525	<0.135	6.05	134	<0.211	79.5	6.08	2.10	<0.106	<0.332
W6	W6-15	15	Fill	ns	<1	<2.41	<23.0	<57.5	--	5.10	84.3	<0.180	35.8	9.04	1.38	<0.0899	<0.300
	W6-25	25	Native	ns	<1	<1.51	<23.0	<57.6	--	3.73	108	<0.193	51.7	4.13	1.69	<0.0964	<0.298
W9	W9-SP-25	25	--	ss	<1	39.8	<22.9	<57.1	--	3.64	--	<0.175	38.4 ⁸	8.08	--	--	<0.265
W10	W10-25	25	Fill	ns	<1	<1.62	<23.4	<58.4	--	5.43	100	<0.183	50.9	4.47	1.86	<0.0914	<0.276
	W10-45	45	Native	ns	<1	<2.79	<20.8	<52.0	--	1.78	32.0	<0.164	30.8	1.38	0.835	<0.0821	<0.260

W6S46	W6S46-15	15	Fill	ns	<1	<3.66	<22.3	<55.7	--	6.63	93.4	<0.183	43.2	3.88	1.51	<0.0917	<0.292
	W6S46-30	30	Native	ns	<1	<3.08	<24.7	<61.7	--	2.51	65.1	<0.192	39.3	2.44	1.21	<0.0962	<0.313
W9S46	W9S46-15	15	Fill	ns	<1	<3.34	<23.2	<58.1	--	9.23	135	<0.192	88.5	9.24	1.82	<0.0958	<0.282
W3S30	D-W3530-4.5	4.5	Fill	ss	<1	--	--	--	--	--	--	--	--	57.0	--	--	--
W3S25	D-W3525-4.5	4.5	Fill	ss	<1	--	--	--	--	--	--	--	--	59.6	--	--	--
W6S27	D-W6527-4.5	4.5	Fill	ss	<1	--	--	--	--	--	--	--	--	42.4	--	--	--
S28	D-528-4.5	4.5	Fill	ss	<1	--	--	--	--	--	--	--	--	3.79	--	--	--
W2S10	W2510-10.0	10	Native	ns	<1	--	<24.1	<60.3	--	--	--	--	--	--	--	--	--
W2S13	W2513-5.0	5	Fill	ss	<1	--	<22.2	<55.6	--	--	--	--	--	--	--	--	--
W4S10	W4510-5.0	5	Fill	ss	<1	--	<22.2	<55.4	--	--	--	--	--	--	--	--	--
S10	510-5.0	5	Fill	ss	<1	--	<23.0	<57.6	--	--	--	--	--	--	--	--	--
W2S7	W257-5.0	5	Fill	ss	<1	--	<21.4	<53.4	--	--	--	--	--	--	--	--	--
W3S5	TP-W3S5-5.0	5	Fill	ss	<1	<5.57	<21.2	<52.9	--	6.47	204	0.293	55.1	165⁹	1.41	0.129	<0.290
W4S20	TP-W4S20-5.0	5	Fill	ss	<1	<5.09	<23.2	<58.0	--	6.03	111	0.317	43.4	89.0	1.38	<0.0911	<0.298
W4S35	TP-W4S35-10.0	10	Fill	ss	<1	<4.70	<20.9	<52.4	--	2.49	49.7	<0.172	24.1	6.93	1.10	<0.0860	<0.280
W14S9	TP-W14S9-5.0 ¹⁰	5	Fill	ms	<1	<7.78	<27.1	<67.7	--	15.0	6,100¹¹	57.9¹²	145¹³	9,190¹⁴	1.32	3.54	0.528
	TP-W14S9-7.5	7.5	Fill	ss	<1	--	--	--	--	--	--	--	--	3.03	--	--	--
W14S36	TP-W14S36-7.5	7.5	Fill	ss	<1	<5.99	<21.5	<53.8	--	3.34	54.9	<0.185	25.8	7.04	1.01	<0.0923	<0.281
MTCA Method A or B Cleanup Level for Unrestricted Land Use						30/100¹⁵	2,000	2,000	1	20	16,000	2	2,000¹⁶	250	400	400	2
						Puget Sound Natural Background Concentration				7	0.6	1	48	24	--	--	0.07
						Cedar Mountain Soil Disposal Facility Acceptance Criteria				5	--	--	--	36	--	--	--

Notes:

¹Approximate exploration locations shown on the attached figures. Chemical analytical testing by Fremont Analytical in Seattle, Washington. Samples were obtained between April 15 and 16, 2015.

²Field screening methods are described in Appendix B.

³Gasoline-range hydrocarbons analyzed by petroleum hydrocarbon identification using Northwest Method NWTPH-HCID.

⁴Diesel- and heavy oil-range hydrocarbons analyzed by Northwest Method NWTPH-Dx Extended with a silica gel cleanup or petroleum hydrocarbon identification using Northwest Method NWTPH-HCID.

⁵Total metals analyzed by EPA Method 6010B/7471A.

⁶The lead detected in this sample was also submitted for TCLP extraction using EPA Method 1311; lead was not detected above laboratory reporting limits (0.5 mg/L).

⁷This sample was also submitted for Mercury with TCLP extraction using EPA Method 1311; mercury was not detected above laboratory reporting limits (0.002 mg/L).

⁸The chromium detected in this sample was also submitted for Chromium Speciation using EPA Method 7196. Hexavalent Chromium (Chromium VI) was not detected above laboratory reporting limits (0.567 mg/kg).

⁹This sample was also submitted for lead with TCLP extraction using EPA Method 1311; lead was detected at a concentration of 0.237 mg/L.

¹⁰This sample was submitted for pH by EPA Method 9045; the pH was 7.21.

¹¹This sample was also submitted for barium with TCLP extraction using EPA Method 1311; barium was detected at a concentration of 1.63 mg/L.

¹²This sample was also submitted for cadmium with TCLP extraction using EPA Method 1311; cadmium was detected at a concentration of 0.251 mg/L.

¹³This sample was also submitted for chromium with TCLP extraction using EPA Method 1311; chromium was not detected above laboratory reporting limits (0.100 mg/L). The chromium detected in this sample was submitted for Chromium Speciation using EPA Method 7196. Hexavalent Chromium (Chromium VI) was not detected above laboratory reporting limits (0.675 mg/kg).

¹⁴This sample was also submitted for lead with TCLP extraction using EPA Method 1311; lead was detected at a concentration of 0.918 mg/L.

¹⁵When benzene is present, the gasoline range cleanup level is 30 mg/kg. When benzene is not present the gasoline range cleanup level is 100 mg/kg.

¹⁶MTCA Method A cleanup level for Chromium III (Trivalent Chromium).

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

ns = no sheen, ss = slight sheen, ms = moderate sheen, hs = high sheen

Bolding indicates analyte was detected. Shading indicates analyte was detected at a concentration greater than the MTCA Method A cleanup level.

bgs = below ground surface

-- = not tested

ne = not established

Table 2
Soil Chemical Analytical Data (PAHs and VOCs)
Project Rufus 2.0
Block 20, Denny Triangle, Seattle, Washington
 GeoEngineers File No. 20434-001-24

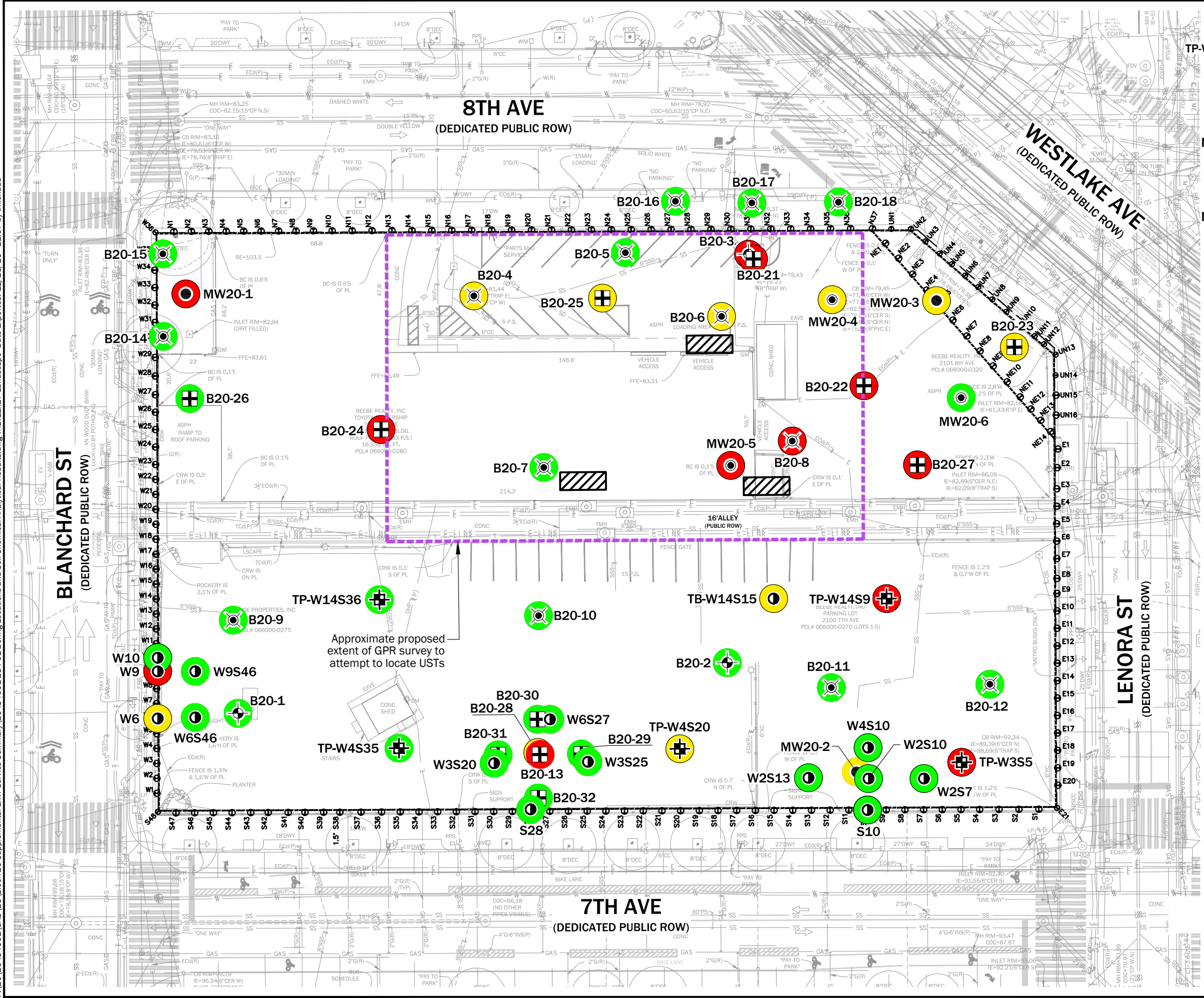
Exploration Location ¹	Sample ID	Depth (feet bgs)	Non-Carcinogenic PAHs ³ (µg/kg)											Total cPAHs ⁴ (µg/kg)	VOCs ⁵ (mg/kg)															
			Naphthalene	2-Methylnaphthalene	1-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(g,h,i)perylene		TEQ	Chloroform	1,1,1-Trichloroethane (TCA)	Toluene	Tetrachloroethene (PCE)	Ethylbenzene	m,p-Xylene	o-Xylene	n-Propylbenzene	1,3,5-Trimethylbenzene	1,2,4-Trichlorobenzene	sec-Butylbenzene	4-Isopropyltoluene	n-Butylbenzene	1,2-Dichlorobenzene	1,2,4-Trimethylbenzene
Direct Push Borings Completed April 15-16, 2015																														
B20-21	B-20-21-10.5	10.5	35,800	48,600	25,600	2,270	697	1,230	51,200	2,130	66,300	67,100	367	13,013	<0.0140	<0.0140	<0.0140	<0.0140	<0.0210	0.0359	<0.0140	0.166	0.0210	0.0648	0.0605	0.0658	0.255	0.0443	0.109	0.0905
B20-22	B-20-22-7.5	7.5	<55.3	<55.3	<55.3	<55.3	<55.3	<55.3	94.3	<55.3	127	136	92.5	111.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B20-23	B-20-23-3.0	3	<57.7	<57.7	<57.7	<57.7	<57.7	<57.7	<57.7	<57.7	<57.7	<57.7	62.0	nd	<0.0302	<0.0302	<0.0302	<0.0302	<0.0453	<0.0302	<0.0302	<0.0302	<0.0302	<0.755	<0.0302	<0.0302	<0.0302	<0.0302	<0.0302	<0.0453
B20-24	B-20-24-3.5	3.5	95.4	112	96.3	<60.2	109	94.4	1,860	511	24,000	29,900	2,110	3,306.6	<0.0208	0.0749	0.0316	0.0569	<0.0313	0.0406	0.0313	<0.0208	<0.0208	<0.0521	<0.0208	<0.0208	<0.0208	<0.0208	0.0248	<0.0313
	B-20-24-8.5	8.5	<64.7	<64.7	<64.7	<64.7	<64.7	<64.7	<64.7	<64.7	<64.7	<64.7	<64.7	nd	<0.0139	<0.0139	<0.0139	<0.0139	<0.0209	<0.0139	<0.0139	<0.0139	<0.0139	<0.0349	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0209
B20-25	B-20-25-2.0	2	<52.7	<52.7	<52.7	<52.7	<52.7	<52.7	<52.7	<52.7	<52.7	<52.7	<52.7	64.3	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B-20-25-12.5	12.5	<53.9	<53.9	<53.9	<53.9	<53.9	<53.9	<53.9	<53.9	<53.9	<53.9	<53.9	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B20-26	B-20-26-3.5	3.5	<54.9	<54.9	<54.9	<54.9	<54.9	<54.9	<54.9	<54.9	<54.9	<54.9	<54.9	nd	<0.00985	<0.00985	<0.00985	<0.00985	<0.0148	<0.00985	<0.00985	<0.00985	<0.00985	<0.0246	<0.00985	<0.00985	<0.00985	<0.00985	<0.00985	<0.0148
B20-27	B-20-27-5.0	5	<53.7	<53.7	<53.7	<53.7	<53.7	<53.7	130	<53.7	204	213	134	164.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B-20-27-17.5	17.5	<54.6	<54.6	<54.6	<54.6	<54.6	<54.6	<54.6	<54.6	<54.6	<54.6	<54.6	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Construction Phase Sampling Completed September 30 through November 21, 2016																														
TB-W14S15	SC-1-5.0	5	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	nd	<0.0183	<0.0183	<0.0183	<0.0183	<0.0274	<0.0183	<0.0183	<0.0183	<0.0183	<0.0457	<0.0183	<0.0183	<0.0183	<0.0183	<0.0183	<0.0274
	SC-2-15.0	15	<53.3	<53.3	<53.3	<53.3	<53.3	<53.3	<53.3	<53.3	<53.3	<53.3	<53.3	nd	<0.0233	<0.0233	<0.0233	<0.0233	<0.0349	<0.0233	<0.0233	<0.0233	<0.0233	<0.0582	<0.0233	<0.0233	<0.0233	<0.0233	<0.0233	<0.0349
W6	W6-15	15	<46.4	<46.4	<46.4	<46.4	<46.4	<46.4	<46.4	<46.4	53.1	<46.4	<46.4	nd	<0.00965	<0.00965	<0.00965	<0.00965	<0.0145	<0.00965	<0.00965	<0.00965	<0.00965	<0.0241	<0.00965	<0.00965	<0.00965	<0.00965	<0.00965	<0.0145
	W6-25	25	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	nd	<0.00602	<0.00602	<0.00602	<0.00602	<0.00904	<0.00602	<0.00602	<0.00602	<0.00602	<0.0151	<0.00602	<0.00602	<0.00602	<0.00602	<0.00602	<0.00904
W9	W9-SP-25	25	<43.3	<43.3	<43.3	<43.3	<43.3	<43.3	727	108	1,890	1,520	319	1,123.36	<0.0223	<0.0223	<0.0223	<0.0223	<0.0335	0.0268	<0.0223	0.0402	0.0324	<0.0558	0.0469	0.0441	0.0849	<0.0223	0.131	0.127
W10	W10-25	25	<44.7	<44.7	<44.7	<44.7	<44.7	<44.7	<44.7	<44.7	<44.7	<44.7	<44.7	nd	<0.00646	<0.00646	<0.00646	<0.00646	<0.00970	<0.00646	<0.00646	<0.00646	<0.00646	<0.0162	<0.00646	<0.00646	<0.00646	<0.00646	<0.00970	
	W10-45	45	<42.1	<42.1	<42.1	<42.1	<42.1	<42.1	<42.1	<42.1	<42.1	<42.1	<42.1	nd	<0.0112	<0.0112	<0.0112	<0.0112	<0.0167	<0.0112	<0.0112	<0.0112	<0.0112	<0.0279	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0167
W6S46	W6S46-15	15	<42.4	<42.4	<42.4	<42.4	<42.4	<42.4	<42.4	<42.4	<42.4	<42.4	<42.4	nd	<0.0147	<0.0147	<0.0147	<0.0147	<0.0220	<0.0147	<0.0147	<0.0147	<0.0147	<0.0366	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0220
	W6S46-30	30	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	<45.2	nd	<0.0123	<0.0123	<0.0123	<0.0123	<0.0185	<0.0123	<0.0123	<0.0123	<0.0123	<0.0308	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0185
W9S46	W9S46-15	15	<43.1	<43.1	<43.1	<43.1	<43.1	<43.1	<43.1	<43.1	<43.1	<43.1	<43.1	nd	<0.0134	<0.0134	<0.0134	<0.0134	<0.0200	<0.0134	<0.0134	<0.0134	<0.0134	<0.0334	<0.0134	<0.0134	<0.0134	<0.0134	<0.0200	
W3S5	TP-W3S5-5.0	5	<44.0	<44.0	<44.0	<44.0	<44.0	<44.0	<44.0	<44.0	<44.0	<44.0	<44.0	109.30	<0.0223	<0.0223	<0.0223	<0.0223	<0.0334	<0.0223	<0.0223	<0.0223	<0.0223	<0.0557	<0.0223	<0.0223	<0.0223	<0.0223	<0.0223	<0.0334
W4S20	TP-W4S20-5.0	5	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	<41.7	43.7	<41.7	nd	<0.0203	<0.0203	<0.0203	<0.0203	<0.0305	<0.0203	<0.0203	<0.0203	<0.0203	<0.0509	<0.0203	<0.0203	<0.0203	<0.0203	<0.0203	<0.0305
W4S35	TP-W4S35-10.0	10	<38.8	<38.8	<38.8	<38.8	<38.8	<38.8	<38.8	<38.8	<38.8	<38.8	<38.8	nd	<0.0188	<0.0188	<0.0188	<0.0188	<0.0282	<0.0188	<0.0188	<0.0188	<0.0188	<0.0470	<0.0188	<0.0188	<0.0188	<0.0188	<0.0282	
W14S9	TP-W14S9-5.0	5	<49.8	<49.8	<49.8	<49.8	<49.8	<49.8	83.4	<49.8	120	113	<49.8	128.59	<0.0311	<0.0311	<0.0311	<0.0311	<0.0467	<0.0311	<0.0311	<0.0311	<0.0311	<0.0778	<0.0311	<0.0311	<0.0311	<0.0311	<0.0311	<0.0467
W14S36	TP-W14S36-7.5	7.5	<49.3	<49.3	<49.3	<49.3	<49.3	<49.3	<49.3	<49.3	<49.3	<49.3	<49.3	nd	0.0377 ⁶	<0.0239	<0.0239	<0.0239	<0.0359	<0.0239	<0.0239	<0.0239	<0.0239	<0.0599	<0.0239	<0.0239	<0.0239	<0.0239	<0.0359	
MTCA Method A or B Cleanup Level for Unrestricted Land Use			5,000 ⁷			ne	4,800,000	3,200,000	ne	2,400,000	3,200,000	2,400,000	ne	100	800	2	7	0.05	6	9 ⁸	8,000	800	800	8,000	ne	4,000	7,200	ne	5	

Notes:

- ¹Approximate exploration locations shown on the attached figures. Chemical analytical testing by Fremont Analytical in Seattle, Washington. Samples were obtained between April 15 and 16, 2015.
- ²Field screening methods are described in Appendix B.
- ³Polycyclic aromatic hydrocarbons (PAHs) analyzed by EPA Method 8270D/SIM. See the laboratory report for the full list of compounds analyzed.
- ⁴Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) analyzed by EPA Method 8270D/SIM. Total cPAHs calculated using the toxicity equivalency (TEQ) methodology specified in WAC 173-340-780(8). cPAHs that were not detected were assigned half the value of the detection limit for these calculations.
- ⁵Volatile organic compounds (VOCs) were analyzed by EPA Method 8260B. For VOCs, only detected compounds are presented in the table. See the laboratory report for the full list of compounds analyzed and detection limits.
- ⁶Chloroform is a laboratory solvent, and may have been introduced during sample preparation. Chloroform was detected in the associated method blank for this sample at a concentration of 0.0380 mg/kg. Chloroform detected in this sample (0.0377 mg/kg) should be considered an estimate. See the laboratory reports presented in Appendix B for more detail.
- ⁷MTCA Method A cleanup level for the sum of all naphthalenes.
- ⁸MTCA method A cleanup level for the sum of m,p- and o-xylenes (Total Xylenes).

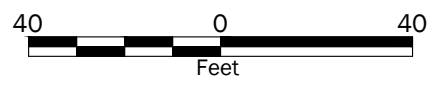
µg/kg = micrograms per kilogram
 bgs = below ground surface
 mg/kg = milligrams per kilogram
 -- = Not Tested
 ne = not established
 nd = not detected above laboratory reporting limits
 Bolding indicates analyte was detected. Shading indicates analyte was detected at a concentration greater than the MTCA Method A cleanup level.

P:\2014\2014001\CAD\23\Block 20 Supplemental Envr Service Summary_2014001.23 Boring Locations and Soil Chemical Analytical Results.dwg TAB:11x17 Landscape Date Exported: 11/23/16 11:07 by tmchaud



Legend

- TP-W14S36 Approximate Location of Test Pit Completed in November, 2016
- W9S46 Approximate Location of Soil Sample Obtained During Construction, September-November, 2016
- B20-21 Direct Push Borings Completed in April 2015
- MW20-4 Shallow Monitoring Wells Completed in April 2012
- B20-4 Direct-Push Borings Completed in April 2012
- B20-1 Hollow-stem Auger Borings Completed in February 2012
- MW20-1 Monitoring Well Completed in February 2012
- Possible or Known Former UST Location
- Contaminants of concern detected at concentrations greater than the corresponding MTCA Method A cleanup levels in one or more soil samples obtained from the boring. See cross-sections for chemical analytical results of discrete soil samples.
- Contaminants of concern detected at concentrations less than the corresponding MTCA Method A cleanup levels. See cross-sections for chemical analytical results of discrete soil samples.
- Contaminants of concern were not detected. Metals were detected at concentrations similar to natural background concentrations.
- Approximate proposed extent of GPR survey to attempt to locate USTs.



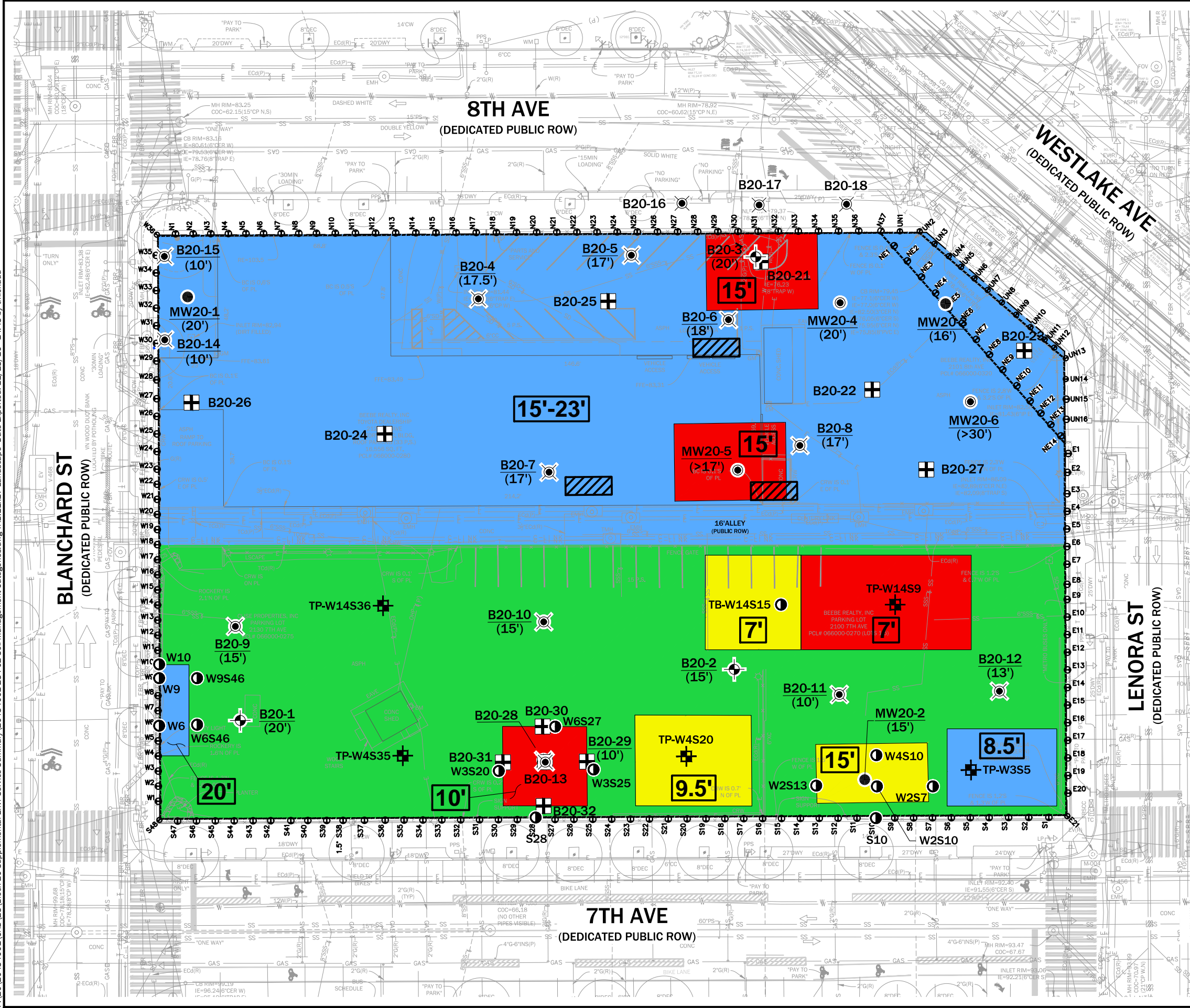
- Notes:**
1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored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

Data Source:
Base survey and shoring design CAD files provided by Sellen on 8-10-2016.

**Boring Locations and
Soil Chemical Analytical Results**

Rufus 2.0 Development
Seattle, Washington

Figure 1



Legend

- TP-W14S36 Approximate Location of Test Pit Completed in November, 2016
- W9S46 Approximate Location of Soil Sample Obtained During Construction, September-November, 2016
- B20-21 Direct Push Borings Completed in April 2015
- MW14-3 Shallow Monitoring Wells Completed in April 2012
- B14-6 Direct-Push Borings Completed in April 2012
- B14-1 Hollow-stem Auger Borings Completed in February 2012
- MW19-1 Monitoring Well Completed in February 2012

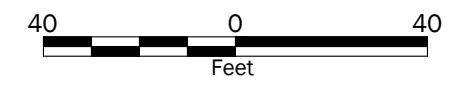
- (2') Approximate Fill Thickness Observed in the Boring
- 15' Estimated Soil Contamination Thickness (feet bgs)
- Contaminants of concern detected at concentrations greater than the MTCA cleanup levels. Soil excavated from these locations will be transported to either Waste Management, CEMEX or Republic for permitted disposal.

- Contaminants of concern detected at concentrations less than the MTCA cleanup levels and less than CEMEX's acceptance criteria for CLASS 2 soil. Fill soil excavated from these locations will be transported to CEMEX for permitted disposal as a CLASS 2 soil.

- Approximate extent of lead-contaminated soil. Soil excavated from these locations will be transported to either Waste Management or Republic for permitted disposal.

- Contaminates of concern were not detected in soil samples obtained to date. Additional samples will be obtained within this area for waste characterization purposes. Pending the analytical results of the additional samples, soil in this area will be disposed of at a "clean soil" disposal facility identified by the earthwork contractor.

Possible or Known UST Location



Notes:

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

Data Source:
Base survey and shoring design CAD files provided by Sellen on 8-10-2016.

Soil Management Categories	
Rufus 2.0 Development Seattle, Washington	
	Figure 2

SOIL CLASSIFICATION CHART

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

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

Sampler Symbol Descriptions

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

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

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

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

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

ADDITIONAL MATERIAL SYMBOLS

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

Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

Graphic Log Contact



Distinct contact between soil strata



Approximate contact between soil strata

Material Description Contact



Contact between geologic units



Contact between soil of the same geologic unit

Laboratory / Field Tests

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

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

KEY TO EXPLORATION LOGS



FIGURE A-1

Drilled	Start 4/15/2015	End 4/15/2015	Total Depth (ft)	15	Logged By Checked By	NS CB	Driller	Cascade Drilling	Drilling Method	Direct-Push
Surface Elevation (ft) Vertical Datum			Undetermined		Hammer Data		N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)			System Datum		Groundwater		Date Measured		Depth to Water (ft) Elevation (ft)	
Notes:									None Observed	

Elevation (feet)	FIELD DATA					Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval Depth (feet)	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing							
0		55						AC SP	Approximately 6 inches of asphalt concrete pavement Brown sand and asphalt subbase (fill)			
					1			SM	Brown silty fine to medium sand with occasional gravel (moist) (fill)	NS	<1	
5		48			2			SP	Gray fine to medium sand with occasional gravel (moist)	MS	<1	Organic sheen
					3			SM	Gray silty fine to medium sand (moist)	NS	<1	
10		50			4 CA			CH	Gray silt with brown fat clay interbeds (dense, moist) (recent deposits)	HS	>100	Heavy odor
					5 CA					NS	<1	
15												

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

Log of Direct-Push Boring B20-21



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Figure A-2
 Sheet 1 of 1

Start Drilled 4/15/2015	End 4/15/2015	Total Depth (ft) 15	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured Depth to Water (ft) Elevation (ft)	
Notes:				None Observed	

Elevation (feet)	FIELD DATA						MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS	
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Water Level					Graphic Log
0		53		1			AC	Approximately 6 inches of asphalt concrete pavement	NS	<1	
							SP-SM	Dark brown fine to medium sand with silt and gravel (moist) (fill)	NS	<1	
				2			SM	Gray silty sand with gravel (moist)	NS	<1	
5		37		3			SM	Gray silty sand with occasional fine to coarse gravel (moist)	NS	<1	
				4			SM	Brown silty fine to medium sand with occasional gravel (moist)	NS	<1	
10		48		5			SM	Black silty sand with organic matter (moist)	NS	<1	
				6			CH	Tan fat clay with gray silt interbeds (recent deposits)	NS	<1	
15				7					NS	<1	

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

Log of Direct-Push Boring B20-22



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Start Drilled 4/16/2015	End 4/16/2015	Total Depth (ft) 9.5	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured	
Notes:				Depth to Water (ft) Elevation (ft) None Observed	

Elevation (feet)	FIELD DATA					Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval Depth (feet)	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing							
0	24						CC	Approximately 6 inches of cement concrete pavement				
				1			SW SM	Brown fine to coarse sand (moist) (fill) Brown silty sand with gravel (moist) (fill)	NS	<1		
				2				Iron oxide staining	NS	<1		
5	48			3			SM	Brown silty sand with gravel, light brown silt interbeds (moist)	NS	<1		
				4			SM	Brown silty fine to medium sand (dense, moist) (recent deposits)	NS	<1		
	18			5					NS	<1		

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

Log of Direct-Push Boring B20-24



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Drilled	Start 4/16/2015	End 4/16/2015	Total Depth (ft)	20	Logged By Checked By	NS CB	Driller	Cascade Drilling	Drilling Method	Direct-Push	
Surface Elevation (ft) Vertical Datum			Undetermined		Hammer Data		N/A		Drilling Equipment		Geoprobe
Easting (X) Northing (Y)			System Datum		Groundwater		Date Measured		Depth to Water (ft)		Elevation (ft)
Notes:									None Observed		

Elevation (feet)	FIELD DATA					Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing							
0		36						AC	Approximately 6 inches of asphalt concrete pavement			
								SW	Brown fine to coarse sand (fill)			
				1				SM	Brown silty fine to medium sand with occasional gravel (moist) (fill)	MS	25	
				2						NS	<1	
5		36		3						NS	<1	
				4						NS	<1	
10		27		5						NS	<1	
				6					Becomes dense	NS	<1	
15		59		7					Becomes moist	NS	<1	
				8				SM	Gray silty fine to medium sand (dense, moist) (recent deposits)	NS	<1	
20										NS	<1	

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

Log of Direct-Push Boring B20-25



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Figure A-5
 Sheet 1 of 1

Drilled	Start 4/16/2015	End 4/16/2015	Total Depth (ft)	8.1	Logged By Checked By	NS CB	Driller	Cascade Drilling	Drilling Method	Direct-Push	
Surface Elevation (ft) Vertical Datum			Undetermined		Hammer Data		N/A		Drilling Equipment		Geoprobe
Easting (X) Northing (Y)					System Datum				Groundwater Date Measured		Depth to Water (ft) Elevation (ft)
Notes:									None Observed		

Elevation (feet)	FIELD DATA						MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Water Level				
0	48			1		CC	Approximately 6 inches of cement concrete pavement			
						SW	Brown fine to coarse sand (moist) (fill)	NS	<1	
						SM	Brown silty sand with gray silt (moist)			
				2				NS	<1	
5	48			3		SM	Brown silty fine to medium sand (dense, moist) (recent deposits)	NS	<1	
				4				NS	<1	
Boring terminated at approximately 8.1 feet below ground surface due to refusal										

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

Log of Direct-Push Boring B20-26



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Start Drilled 4/15/2015	End 4/15/2015	Total Depth (ft) 25	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured	
Notes:				Depth to Water (ft) Elevation (ft) None Observed	

Elevation (feet)	FIELD DATA					Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing							
0	1						AC	Approximately 6 inches of asphalt concrete pavement No recovery				
5	25		1				SM	Brown silty fine to medium sand with occasional gravel (moist) (fill)	NS	<1		
			2						NS	<1		
10	1		3						NS	<1		
15	60		4				SP-SM	Tan fine to medium sand with silt (moist)	NS	<1		
			5					Becomes brown, dense	NS	<1		
20	51		6				SM	Brown silty sand (dense, moist)	NS	<1		
			7				SM	Brown silty sand with gray silty sand interbedded (moist) (recent deposits)	NS	<1		

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

Log of Direct-Push Boring B20-27



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Figure A-7
 Sheet 1 of 1

Start Drilled 4/16/2015	End 4/16/2015	Total Depth (ft) 15	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured	
Notes:				Depth to Water (ft) Elevation (ft) None Observed	

Elevation (feet)	FIELD DATA						MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Water Level				
0		37					AC			Approximately 6 inches of asphalt concrete pavement
				1			SP	NS	<1	Brown fine to medium sand with gravel (moist) (fill)
				2			SM	NS	<1	Brown silty fine to medium sand with occasional gravel (moist)
5		25		3			SM	NS	<1	Gray silty fine to medium sand with occasional gravel (moist)
				4				NS	<1	
10		59		5			SM	NS	<1	Brown silty fine to medium sand (dense, moist) (recent deposits)
				6				NS	<1	
15										

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

Log of Direct-Push Boring B20-28



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Figure A-8
 Sheet 1 of 1

Start Drilled 4/16/2015	End 4/16/2015	Total Depth (ft) 15	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured	
Notes:				Depth to Water (ft) Elevation (ft) None Observed	

Elevation (feet)	FIELD DATA						MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS					
	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing					Water Level	Graphic Log	Group Classification		
0			37								AC SP	Approximately 6 inches of asphalt concrete pavement			
					1						SM	Brown fine to medium sand with gravel (moist) (fill)	NS	<1	
					2						SM	Brown silty sand with occasional gravel (moist)	NS	<1	
5					3						SM	Gray silty sand with trace brick and crushed concrete (moist)	NS	<1	
					4						SM	Brown silty sand with staining (dense, moist)	NS	<1	
10			60		5						SM	Brown silty fine to medium sand (moist) (recent deposits)	NS	<1	
					6						SM	Brown silty fine to medium sand with interbedded layers of gray silty sand (dense, moist)	NS	<1	
15															

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

Log of Direct-Push Boring B20-29



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Figure A-9
 Sheet 1 of 1

Start Drilled 4/16/2015	End 4/16/2015	Total Depth (ft) 15	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured	
Notes:				Depth to Water (ft) Elevation (ft) None Observed	

Elevation (feet)	FIELD DATA						MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS	
	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing					Water Level
0											
		37			1			AC	Approximately 12 inches of asphalt concrete pavement	NS	<1
					2			SM	Brown sand with gravel (loose, moist) (fill)	NS	<1
					3			SM	Brown silty sand with brick fragments (moist)	NS	<1
5		59			4			SM	Gray silty sand with trace gravel and brick (moist)	NS	<1
					5			SM	Brown silty fine to medium sand with gray silty sand interbedded (dense, moist) (recent deposits)	NS	<1
10		60			6				Becomes moist	NS	<1
15											

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

Log of Direct-Push Boring B20-30



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Start Drilled 4/16/2015	End 4/16/2015	Total Depth (ft) 15	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured Depth to Water (ft) Elevation (ft)	
Notes:				None Observed	

Elevation (feet)	FIELD DATA						MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing				
0										
		37								
					1				AC	Approximately 6 inches of asphalt concrete pavement
									SP	Brown poorly-graded sand with fine to coarse gravel (moist) (fill)
					2				SM	Brown silty sand with occasional gravel (moist)
										Staining
5		37			3					
									SM	Gray silty sand with occasional gravel (moist)
					4					With organic matter
10		50			5					
									SM	Brown silty fine to medium sand (moist) (recent deposits)
					6					
15										

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

Log of Direct-Push Boring B20-31



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Figure A-11
 Sheet 1 of 1

Start Drilled 4/16/2015	End 4/16/2015	Total Depth (ft) 15	Logged By Checked By NS CB	Driller Cascade Drilling	Drilling Method Direct-Push
Surface Elevation (ft) Vertical Datum Undetermined		Hammer Data N/A		Drilling Equipment Geoprobe	
Easting (X) Northing (Y)		System Datum		Groundwater Date Measured	
Notes:				Depth to Water (ft) Elevation (ft) None Observed	

Elevation (feet)	FIELD DATA						MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing				
0										
		35			1			AC	Approximately 6 inches of asphalt concrete pavement	
								SM	Brown silty fine to medium sand with occasional gravel (moist) (fill)	NS <1
					2					NS <1
5		36			3			SP	Brown fine to medium sand with gravel (moist)	NS <1
					4			SM	Gray silty fine to coarse sand (dense, moist) (moist)	NS <1
10		48			5			SM	Brown silty fine to coarse sand (dense, moist) (recent deposits)	NS <1
					6				With occasional gravel	NS <1
15								SM	Brown silty fine to coarse sand with gray silty sand interbeds	NS <1

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

Log of Direct-Push Boring B20-32



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Figure A-12
 Sheet 1 of 1

Date Excavated	11/21/2016	Total Depth (ft)	10	Logged By	SJB	Excavator	Excavation Equipment	Track hoe PC 490 LC
Checked By	CB							
Surface Elevation (ft) Vertical Datum		94		Easting (X) Northing (Y)		Coordinate System Horizontal Datum		

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor	Notes
		Testing Sample	Sample Name Testing						
93	1				SM	Brown silty fine to medium sand with gravel and debris (asphalt, bricks, concrete) (moist) (fill)			
92	2								
91	3								
90	4								
89	5	⊗	TP-W3S5-5.0			Black with wood and debris	SS	<1	
88	6								
87	7					Brown to gray, no wood or debris			
86	8								
85	9				CH	Tan to gray fat clay (moist) (recent deposits)	NS	<1	
84	10								
Test pit completed at 10 feet No groundwater seepage observed No caving observed Surface elevation is approximate									

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

Log of Test Pit TP-W3S5



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Date Excavated	11/21/2016	Total Depth (ft)	10	Logged By	SJB	Excavator	Excavation Equipment	Track hoe PC 490 LC
Checked By	CB							
Surface Elevation (ft) Vertical Datum		96		Easting (X) Northing (Y)		Coordinate System Horizontal Datum		

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor	Notes
		Testing Sample	Sample Name Testing						
96	1				SM	Brown silty fine to medium sand with gravel and construction debris (bricks, PVC, concrete, possible battery?) (moist) (fill)			
94	2								
93	3								
92	4								
91	5	⊗	TP-W4S20-5.0 CA				SS	<1	
90	6								
88	7								
88	8								
87	9						NS	<1	
86	10				CH	Tan to gray fat clay (moist) (recent deposits)			
<p>Test pit completed at 10 feet No groundwater seepage observed No caving observed Surface elevation is approximate</p>									

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

Seattle: Date: 11/28/16 Path: P:\20\20434001\GINT\2043400124.GPJ DBT Template\LIB Template\GEOENGINEERS_DF_STD_US GDT\GEB_TESTPIT_1P_ENV

Log of Test Pit TP-W4S20



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24

Date Excavated	11/21/2016	Total Depth (ft)	15	Logged By	SJB	Excavator	Excavation Equipment	Track hoe PC 490 LC
Checked By	CB	Surface Elevation (ft) Vertical Datum		Easting (X) Northing (Y)		Coordinate System Horizontal Datum		

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor	Notes
		Testing Sample	Sample Name Testing						
97	1				SM	Brown silty fine to medium sand with gravel (fill)			
96	2								
95	3	TP-W4S35-2.5					SS	<1	
94	4					Construction debris (PVC, brick, concrete)			
93	5	TP-W4S35-5.0					SS	<1	
92	6								
91	7								
90	8	TP-W4S35-7.5			SM	Black silty fine to medium sand with debris (brick, wood, asphalt/concrete)	SS	<1	
89	9								
88	10	TP-W4S35-10.0 CA				Brown silty fine to medium sand and gravel	SS	<1	
87	11								
86	12								
85	13	TP-W4S35-12.5				Black silty fine to medium sand with debris (brick, wood, asphalt/concrete)	MS	<1	
84	14								
83	15	TP-W4S35-15.0			CH	Tan to gray fat clay with sand (moist) (recent deposits)	MS	<1	

Test pit completed at 15 feet
No groundwater seepage observed
Moderate caving observed at 5 feet
Surface elevation is approximate

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

Log of Test Pit TP-W4S35



Project: Rufus 2.0 Development Block 20
Project Location: Seattle, Washington
Project Number: 20434-001-24

Seattle: Date: 11/28/16 Path: P:\20\20434\001\GINT\2043400124.GPJ DBT Template\LIB Template\GEOENGINEERS_DF_STD_US GDT\GEB_TESTPIT_1P_ENV

Date Excavated	11/21/2016	Total Depth (ft)	12.5	Logged By	SJB	Excavator	Excavation Equipment	Track hoe PC 490 LC
Checked By	CB	Surface Elevation (ft) Vertical Datum	98	Easting (X) Northing (Y)	Coordinate System Horizontal Datum			

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor	Notes
		Testing Sample	Sample Name Testing						
97	1				SM	Brown silty fine to medium sand with gravel (moist) (fill)			
96	2								
95	3	TP-W14S36-2.5					SS	<1	
94	4								
93	5	TP-W14S36-5.0					SS	<1	
92	6								
91	7								
90	8	TP-W14S36-7.5 CA				Gray silt with orange mottling (moist)	SS	<1	
89	9								
88	10	TP-W14S36-10.0			SM	Black silty fine to medium sand with wood and debris (burned material, glass, possible treated wood)	MS	<1	
87	11								
86	12	TP-W14S36-12.5			CH	Tan to gray fat clay with sand (very stiff, moist) (recent deposits)	NS	<1	
<p>Test pit completed at 12½ feet No groundwater seepage observed No caving observed Surface elevation is approximate</p>									

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

Log of Test Pit TP-W14S36



Project: Rufus 2.0 Development Block 20
 Project Location: Seattle, Washington
 Project Number: 20434-001-24


Seattle: Date: 11/28/16 Path: P:\20\20434\001\GINT\2043400124.GPJ DBT Template\Lib\Template\GEOENGINEERS_DF_STD_US_GDT\GEB_TESTPIT_1P_ENV

Date Excavated	11/21/2016	Total Depth (ft)	7.5	Logged By	SJB	Excavator	Excavation Equipment	Track hoe PC 490 LC
Checked By	CB	Surface Elevation (ft) Vertical Datum	95	Easting (X) Northing (Y)	Coordinate System Horizontal Datum			

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor	Notes
		Testing Sample	Sample Name Testing						
94	1				SM	Brown silty fine to medium sand with gravel and construction debris (PVC, bricks, concrete) (moist) (fill)			
93	2								
92	3	⊗	TP-W14S9-2.5				SS	<1	
91	4					Black silty fine to medium sand with debris (glass, garbage, asphalt/concrete, brick) (moist)			
90	5	⊗	TP-W14S9-5.0 CA				MS	<1	
89	6								
88	7	⊗	TP-W14S9-7.5		CH	Tan to gray fat clay with sand (stiff, moist) (recent deposits)	NS	<1	
Test pit completed at 7½ feet No groundwater seepage observed No caving observed Surface elevation is approximate									

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

Seattle: Date: 11/28/16 Path: P:\20\20434\001\GINT\2043400124.GPJ DBT Template\LIB\Template\GEOENGINEERS_DF_STD_US_GDT\GEB_TESTPIT_1P_ENV

Log of Test Pit TP-W14S9		
	Project:	Rufus 2.0 Development Block 20
	Project Location:	Seattle, Washington
	Project Number:	20434-001-24
		Figure A-16 Sheet 1 of 1



3600 Fremont Ave. N.

Seattle, WA 98103

T: (206) 352-3790

F: (206) 352-7178

info@fremontanalytical.com

GeoEngineers

Jessica Smith
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Block 20 Rufus 2.0

Lab ID: 1504151

April 30, 2015

Attention Jessica Smith:

Fremont Analytical, Inc. received 41 sample(s) on 4/16/2015 for the analyses presented in the following report.

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

Gasoline by NWTPH-Gx

Mercury by EPA Method 7471

Metals (SW6020) with TCLP Extraction (EPA 1311)

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample Moisture (Percent Moisture)

Total Metals by EPA Method 6020

Volatile Organic Compounds by EPA Method 8260

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
President



Date: 04/30/2015

CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0
Lab Order: 1504151

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1504151-001	B-20-32-1.0	04/16/2015 7:30 AM	04/16/2015 2:45 PM
1504151-002	B-20-32-3.5	04/16/2015 7:32 AM	04/16/2015 2:45 PM
1504151-003	B-20-32-6.0	04/16/2015 7:35 AM	04/16/2015 2:45 PM
1504151-004	B-20-32-8.5	04/16/2015 7:40 AM	04/16/2015 2:45 PM
1504151-005	B-20-32-11.0	04/16/2015 7:45 AM	04/16/2015 2:45 PM
1504151-006	B-20-32-13.5	04/16/2015 7:50 AM	04/16/2015 2:45 PM
1504151-007	B-20-28-1.0	04/16/2015 7:52 AM	04/16/2015 2:45 PM
1504151-008	B-20-28-3.5	04/16/2015 7:55 AM	04/16/2015 2:45 PM
1504151-009	B-20-28-6.0	04/16/2015 8:00 AM	04/16/2015 2:45 PM
1504151-010	B-20-28-8.5	04/16/2015 8:05 AM	04/16/2015 2:45 PM
1504151-011	B-20-28-11.0	04/16/2015 8:10 AM	04/16/2015 2:45 PM
1504151-012	B-20-28-13.5	04/16/2015 8:15 AM	04/16/2015 2:45 PM
1504151-013	B-20-30-1.0	04/16/2015 8:20 AM	04/16/2015 2:45 PM
1504151-014	B-20-30-3.5	04/16/2015 8:25 AM	04/16/2015 2:45 PM
1504151-015	B-20-30-6.0	04/16/2015 8:30 AM	04/16/2015 2:45 PM
1504151-016	B-20-30-8.5	04/16/2015 8:35 AM	04/16/2015 2:45 PM
1504151-017	B-20-30-11.0	04/16/2015 8:40 AM	04/16/2015 2:45 PM
1504151-018	B-20-30-13.5	04/16/2015 8:45 AM	04/16/2015 2:45 PM
1504151-019	B-20-31-1.5	04/16/2015 8:50 AM	04/16/2015 2:45 PM
1504151-020	B-20-31-3.0	04/16/2015 8:55 AM	04/16/2015 2:45 PM
1504151-021	B-20-31-5.5	04/16/2015 9:00 AM	04/16/2015 2:45 PM
1504151-022	B-20-31-8.0	04/16/2015 9:05 AM	04/16/2015 2:45 PM
1504151-023	B-20-31-10.5	04/16/2015 9:10 AM	04/16/2015 2:45 PM
1504151-024	B-20-31-13.0	04/16/2015 9:15 AM	04/16/2015 2:45 PM
1504151-025	B-20-29-1.0	04/16/2015 9:20 AM	04/16/2015 2:45 PM
1504151-026	B-20-29-3.5	04/16/2015 9:25 AM	04/16/2015 2:45 PM
1504151-027	B-20-29-6.0	04/16/2015 9:30 AM	04/16/2015 2:45 PM
1504151-028	B-20-29-8.5	04/16/2015 9:35 AM	04/16/2015 2:45 PM
1504151-029	B-20-29-11.0	04/16/2015 9:40 AM	04/16/2015 2:45 PM
1504151-030	B-20-29-13.5	04/16/2015 9:45 AM	04/16/2015 2:45 PM
1504151-031	B-20-26-1.0	04/16/2015 10:55 AM	04/16/2015 2:45 PM
1504151-032	B-20-26-3.5	04/16/2015 11:00 AM	04/16/2015 2:45 PM
1504151-033	B-20-26-6.0	04/16/2015 11:05 AM	04/16/2015 2:45 PM
1504151-034	B-20-26-7.5	04/16/2015 11:10 AM	04/16/2015 2:45 PM
1504151-035	B-20-20-1.5	04/16/2015 12:20 PM	04/16/2015 2:45 PM
1504151-036	B-20-24-1.0	04/16/2015 1:05 PM	04/16/2015 2:45 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0
Lab Order: 1504151

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1504151-037	B-20-24-3.5	04/16/2015 1:10 PM	04/16/2015 2:45 PM
1504151-038	B-20-24-5.0	04/16/2015 1:15 PM	04/16/2015 2:45 PM
1504151-039	B-20-24-7.5	04/16/2015 1:20 PM	04/16/2015 2:45 PM
1504151-040	B-20-24-8.5	04/16/2015 1:25 PM	04/16/2015 2:45 PM
1504151-041	Trip Blank_041615		04/16/2015 2:45 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Analytical Report

WO#: 1504151
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 7:40:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-004

Matrix: Soil

Client Sample ID: B-20-32-8.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Lead	6.65	0.221		mg/Kg-dry	1	4/24/2015 4:42:00 PM
------	------	-------	--	-----------	---	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	25.8			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 8:00:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-009

Matrix: Soil

Client Sample ID: B-20-28-6.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Lead	94.5	0.173		mg/Kg-dry	1	4/24/2015 5:10:16 PM
------	------	-------	--	-----------	---	----------------------

Metals (SW6020) with TCLP Extraction (EPA 1311)

Batch ID: 10620 Analyst: TN

Lead	ND	0.500		mg/L	1	4/24/2015 6:31:35 PM
------	----	-------	--	------	---	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	8.87			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 8:05:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-010

Matrix: Soil

Client Sample ID: B-20-28-8.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Lead	10.2	0.211		mg/Kg-dry	1	4/24/2015 5:13:48 PM
------	------	-------	--	-----------	---	----------------------

Metals (SW6020) with TCLP Extraction (EPA 1311)

Batch ID: 10620 Analyst: TN

Lead	ND	0.500		mg/L	1	4/24/2015 7:04:33 PM
------	----	-------	--	------	---	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	21.6			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 8:35:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-016

Matrix: Soil

Client Sample ID: B-20-30-8.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Lead	5.71	0.184		mg/Kg-dry	1	4/24/2015 5:17:19 PM
------	------	-------	--	-----------	---	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	17.1			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 9:05:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-022

Matrix: Soil

Client Sample ID: B-20-31-8.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Lead	26.5	0.197		mg/Kg-dry	1	4/24/2015 5:20:51 PM
------	------	-------	--	-----------	---	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	17.5			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 9:35:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-028

Matrix: Soil

Client Sample ID: B-20-29-8.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Lead	8.32	0.199		mg/Kg-dry	1	4/24/2015 5:24:23 PM
------	------	-------	--	-----------	---	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	21.7			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 11:00:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-032

Matrix: Soil

Client Sample ID: B-20-26-3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>			Batch ID: 10615		Analyst: EC	
Diesel (Fuel Oil)	ND	22.2		mg/Kg-dry	1	4/23/2015 10:47:00 PM
Heavy Oil	ND	55.6		mg/Kg-dry	1	4/23/2015 10:47:00 PM
Surr: 2-Fluorobiphenyl	89.2	50-150		%REC	1	4/23/2015 10:47:00 PM
Surr: o-Terphenyl	90.5	50-150		%REC	1	4/23/2015 10:47:00 PM
<u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u>			Batch ID: 10614		Analyst: NG	
Naphthalene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
2-Methylnaphthalene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
1-Methylnaphthalene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Acenaphthylene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Acenaphthene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Fluorene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Phenanthrene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Anthracene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Fluoranthene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Pyrene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Benz(a)anthracene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Chrysene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Benzo(b)fluoranthene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Benzo(k)fluoranthene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Benzo(a)pyrene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Indeno(1,2,3-cd)pyrene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Dibenz(a,h)anthracene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Benzo(g,h,i)perylene	ND	54.9		µg/Kg-dry	1	4/27/2015 7:14:00 PM
Surr: 2-Fluorobiphenyl	82.6	42.7-132		%REC	1	4/27/2015 7:14:00 PM
Surr: Terphenyl-d14 (surr)	92.4	48.8-157		%REC	1	4/27/2015 7:14:00 PM
<u>Gasoline by NWTPH-Gx</u>			Batch ID: 10640		Analyst: BC	
Gasoline	ND	2.46		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Surr: Toluene-d8	92.1	65-135		%REC	1	4/28/2015 2:31:00 AM
Surr: 4-Bromofluorobenzene	107	65-135		%REC	1	4/28/2015 2:31:00 AM
<u>Volatile Organic Compounds by EPA Method 8260</u>			Batch ID: 10640		Analyst: BC	
Dichlorodifluoromethane (CFC-12)	ND	0.0296		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Chloromethane	ND	0.0296		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Vinyl chloride	ND	0.000985		mg/Kg-dry	1	4/28/2015 2:31:00 AM



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 11:00:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-032

Matrix: Soil

Client Sample ID: B-20-26-3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10640

Analyst: BC

Bromomethane	ND	0.0443		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Chloroethane	ND	0.0296		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,1-Dichloroethene	ND	0.0246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Methylene chloride	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
trans-1,2-Dichloroethene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,1-Dichloroethane	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
2,2-Dichloropropane	ND	0.0246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
cis-1,2-Dichloroethene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Chloroform	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,1-Dichloropropene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Carbon tetrachloride	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2-Dichloroethane (EDC)	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Benzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Trichloroethene (TCE)	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2-Dichloropropane	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Bromodichloromethane	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Dibromomethane	ND	0.0197		mg/Kg-dry	1	4/28/2015 2:31:00 AM
cis-1,3-Dichloropropene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Toluene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
trans-1,3-Dichloropropylene	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,1,2-Trichloroethane	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,3-Dichloropropane	ND	0.0246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Tetrachloroethene (PCE)	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Dibromochloromethane	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2-Dibromoethane (EDB)	ND	0.00246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Chlorobenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Ethylbenzene	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM
m,p-Xylene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
o-Xylene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Styrene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Isopropylbenzene	ND	0.0394		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Bromoform	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,1,2,2-Tetrachloroethane	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
n-Propylbenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Bromobenzene	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM



Analytical Report

WO#: 1504151
Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 11:00:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-032

Matrix: Soil

Client Sample ID: B-20-26-3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10640 Analyst: BC

1,3,5-Trimethylbenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
2-Chlorotoluene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
4-Chlorotoluene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
tert-Butylbenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2,3-Trichloropropane	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2,4-Trichlorobenzene	ND	0.0246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
sec-Butylbenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
4-Isopropyltoluene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,3-Dichlorobenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,4-Dichlorobenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
n-Butylbenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2-Dichlorobenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2-Dibromo-3-chloropropane	ND	0.246		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2,4-Trimethylbenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Hexachlorobutadiene	ND	0.0493		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Naphthalene	ND	0.0148		mg/Kg-dry	1	4/28/2015 2:31:00 AM
1,2,3-Trichlorobenzene	ND	0.00985		mg/Kg-dry	1	4/28/2015 2:31:00 AM
Surr: Dibromofluoromethane	92.6	63.7-129		%REC	1	4/28/2015 2:31:00 AM
Surr: Toluene-d8	94.2	64.3-131		%REC	1	4/28/2015 2:31:00 AM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	4/28/2015 2:31:00 AM

Mercury by EPA Method 7471

Batch ID: 10632 Analyst: TN

Mercury	ND	0.277		mg/Kg-dry	1	4/27/2015 2:02:05 PM
---------	----	-------	--	-----------	---	----------------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Arsenic	6.65	0.0903		mg/Kg-dry	1	4/24/2015 5:27:55 PM
Cadmium	ND	0.181		mg/Kg-dry	1	4/24/2015 5:27:55 PM
Chromium	44.4	0.0903		mg/Kg-dry	1	4/24/2015 5:27:55 PM
Lead	3.81	0.181		mg/Kg-dry	1	4/24/2015 5:27:55 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	11.4			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 1:10:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-037

Matrix: Soil

Client Sample ID: B-20-24-3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>					Batch ID: 10615	Analyst: EC
Diesel (Fuel Oil)	ND	22.4		mg/Kg-dry	1	4/23/2015 11:50:00 PM
Heavy Oil	ND	55.9		mg/Kg-dry	1	4/23/2015 11:50:00 PM
Surr: 2-Fluorobiphenyl	88.2	50-150		%REC	1	4/23/2015 11:50:00 PM
Surr: o-Terphenyl	92.8	50-150		%REC	1	4/23/2015 11:50:00 PM
<u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u>					Batch ID: 10614	Analyst: NG
Naphthalene	95.4	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
2-Methylnaphthalene	112	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
1-Methylnaphthalene	96.3	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Acenaphthylene	ND	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Acenaphthene	109	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Fluorene	94.4	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Phenanthrene	1,860	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Anthracene	511	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Fluoranthene	24,000	3,010	D	µg/Kg-dry	50	4/28/2015 5:10:00 PM
Pyrene	29,900	3,010	D	µg/Kg-dry	50	4/28/2015 5:10:00 PM
Benz(a)anthracene	2,270	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Chrysene	2,660	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Benzo(b)fluoranthene	3,280	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Benzo(k)fluoranthene	830	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Benzo(a)pyrene	2,350	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Indeno(1,2,3-cd)pyrene	1,650	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Dibenz(a,h)anthracene	1,270	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Benzo(g,h,i)perylene	2,110	60.2		µg/Kg-dry	1	4/27/2015 8:28:00 PM
Surr: 2-Fluorobiphenyl	78.1	42.7-132		%REC	1	4/27/2015 8:28:00 PM
Surr: Terphenyl-d14 (surr)	87.2	48.8-157		%REC	1	4/27/2015 8:28:00 PM
<u>Gasoline by NWTPH-Gx</u>					Batch ID: 10616	Analyst: BC
Gasoline	ND	5.21		mg/Kg-dry	1	4/27/2015 12:46:00 PM
Surr: Toluene-d8	93.4	65-135		%REC	1	4/24/2015 3:49:00 AM
Surr: 4-Bromofluorobenzene	94.4	65-135		%REC	1	4/24/2015 3:49:00 AM
<u>Volatile Organic Compounds by EPA Method 8260</u>					Batch ID: 10616	Analyst: BC
Dichlorodifluoromethane (CFC-12)	ND	0.0625		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Chloromethane	ND	0.0625		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Vinyl chloride	ND	0.00208		mg/Kg-dry	1	4/24/2015 3:49:00 AM



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 1:10:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-037

Matrix: Soil

Client Sample ID: B-20-24-3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10616

Analyst: BC

Bromomethane	ND	0.0938		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Chloroethane	ND	0.0625		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,1-Dichloroethene	ND	0.0521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Methylene chloride	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
trans-1,2-Dichloroethene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,1-Dichloroethane	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
2,2-Dichloropropane	ND	0.0521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
cis-1,2-Dichloroethene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Chloroform	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,1,1-Trichloroethane (TCA)	0.0749	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,1-Dichloropropene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Carbon tetrachloride	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2-Dichloroethane (EDC)	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Benzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Trichloroethene (TCE)	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2-Dichloropropane	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Bromodichloromethane	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Dibromomethane	ND	0.0417		mg/Kg-dry	1	4/24/2015 3:49:00 AM
cis-1,3-Dichloropropene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Toluene	0.0316	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
trans-1,3-Dichloropropylene	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,1,2-Trichloroethane	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,3-Dichloropropane	ND	0.0521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Tetrachloroethene (PCE)	0.0569	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Dibromochloromethane	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2-Dibromoethane (EDB)	ND	0.00521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Chlorobenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Ethylbenzene	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM
m,p-Xylene	0.0406	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
o-Xylene	0.0313	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Styrene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Isopropylbenzene	ND	0.0834		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Bromoform	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,1,2,2-Tetrachloroethane	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
n-Propylbenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Bromobenzene	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 1:10:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-037

Matrix: Soil

Client Sample ID: B-20-24-3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10616

Analyst: BC

1,3,5-Trimethylbenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
2-Chlorotoluene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
4-Chlorotoluene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
tert-Butylbenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2,3-Trichloropropane	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2,4-Trichlorobenzene	ND	0.0521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
sec-Butylbenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
4-Isopropyltoluene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,3-Dichlorobenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,4-Dichlorobenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
n-Butylbenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2-Dichlorobenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2-Dibromo-3-chloropropane	ND	0.521		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2,4-Trimethylbenzene	0.0248	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Hexachlorobutadiene	ND	0.104		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Naphthalene	ND	0.0313		mg/Kg-dry	1	4/24/2015 3:49:00 AM
1,2,3-Trichlorobenzene	ND	0.0208		mg/Kg-dry	1	4/24/2015 3:49:00 AM
Surr: Dibromofluoromethane	97.6	63.7-129		%REC	1	4/24/2015 3:49:00 AM
Surr: Toluene-d8	106	64.3-131		%REC	1	4/24/2015 3:49:00 AM
Surr: 1-Bromo-4-fluorobenzene	102	63.1-141		%REC	1	4/24/2015 3:49:00 AM

Mercury by EPA Method 7471

Batch ID: 10632

Analyst: TN

Mercury	0.452	0.304		mg/Kg-dry	1	4/27/2015 2:03:41 PM
---------	-------	-------	--	-----------	---	----------------------

Total Metals by EPA Method 6020

Batch ID: 10621

Analyst: TN

Arsenic	14.7	0.103		mg/Kg-dry	1	4/24/2015 5:31:26 PM
Cadmium	0.853	0.205		mg/Kg-dry	1	4/24/2015 5:31:26 PM
Chromium	37.8	0.103		mg/Kg-dry	1	4/24/2015 5:31:26 PM
Lead	216	0.205		mg/Kg-dry	1	4/24/2015 5:31:26 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985

Analyst: CG

Percent Moisture	19.4			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 1:25:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-040

Matrix: Soil

Client Sample ID: B-20-24-8.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>			Batch ID: 10615		Analyst: EC	
Diesel (Fuel Oil)	ND	26.6		mg/Kg-dry	1	4/24/2015 12:21:00 AM
Heavy Oil	ND	66.6		mg/Kg-dry	1	4/24/2015 12:21:00 AM
Surr: 2-Fluorobiphenyl	74.8	50-150		%REC	1	4/24/2015 12:21:00 AM
Surr: o-Terphenyl	76.1	50-150		%REC	1	4/24/2015 12:21:00 AM
<u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u>			Batch ID: 10614		Analyst: NG	
Naphthalene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
2-Methylnaphthalene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
1-Methylnaphthalene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Acenaphthylene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Acenaphthene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Fluorene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Phenanthrene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Anthracene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Fluoranthene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Pyrene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Benz(a)anthracene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Chrysene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Benzo(b)fluoranthene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Benzo(k)fluoranthene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Benzo(a)pyrene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Indeno(1,2,3-cd)pyrene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Dibenz(a,h)anthracene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Benzo(g,h,i)perylene	ND	64.7		µg/Kg-dry	1	4/27/2015 8:52:00 PM
Surr: 2-Fluorobiphenyl	83.7	42.7-132		%REC	1	4/27/2015 8:52:00 PM
Surr: Terphenyl-d14 (surr)	97.5	48.8-157		%REC	1	4/27/2015 8:52:00 PM
<u>Gasoline by NWTPH-Gx</u>			Batch ID: 10616		Analyst: BC	
Gasoline	ND	3.49		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Surr: Toluene-d8	91.7	65-135		%REC	1	4/24/2015 4:18:00 AM
Surr: 4-Bromofluorobenzene	93.7	65-135		%REC	1	4/24/2015 4:18:00 AM
<u>Volatile Organic Compounds by EPA Method 8260</u>			Batch ID: 10616		Analyst: BC	
Dichlorodifluoromethane (CFC-12)	ND	0.0418		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Chloromethane	ND	0.0418		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Vinyl chloride	ND	0.00139		mg/Kg-dry	1	4/24/2015 4:18:00 AM



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 1:25:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-040

Matrix: Soil

Client Sample ID: B-20-24-8.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10616

Analyst: BC

Bromomethane	ND	0.0627		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Chloroethane	ND	0.0418		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,1-Dichloroethene	ND	0.0349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Methylene chloride	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
trans-1,2-Dichloroethene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,1-Dichloroethane	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
2,2-Dichloropropane	ND	0.0349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
cis-1,2-Dichloroethene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Chloroform	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,1-Dichloropropene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Carbon tetrachloride	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2-Dichloroethane (EDC)	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Benzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Trichloroethene (TCE)	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2-Dichloropropane	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Bromodichloromethane	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Dibromomethane	ND	0.0279		mg/Kg-dry	1	4/24/2015 4:18:00 AM
cis-1,3-Dichloropropene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Toluene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
trans-1,3-Dichloropropylene	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,1,2-Trichloroethane	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,3-Dichloropropane	ND	0.0349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Tetrachloroethene (PCE)	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Dibromochloromethane	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2-Dibromoethane (EDB)	ND	0.00349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Chlorobenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Ethylbenzene	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM
m,p-Xylene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
o-Xylene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Styrene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Isopropylbenzene	ND	0.0558		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Bromoform	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,1,2,2-Tetrachloroethane	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
n-Propylbenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Bromobenzene	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM



Analytical Report

WO#: 1504151

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/16/2015 1:25:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504151-040

Matrix: Soil

Client Sample ID: B-20-24-8.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10616

Analyst: BC

1,3,5-Trimethylbenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
2-Chlorotoluene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
4-Chlorotoluene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
tert-Butylbenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2,3-Trichloropropane	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2,4-Trichlorobenzene	ND	0.0349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
sec-Butylbenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
4-Isopropyltoluene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,3-Dichlorobenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,4-Dichlorobenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
n-Butylbenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2-Dichlorobenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2-Dibromo-3-chloropropane	ND	0.349		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2,4-Trimethylbenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Hexachlorobutadiene	ND	0.0697		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Naphthalene	ND	0.0209		mg/Kg-dry	1	4/24/2015 4:18:00 AM
1,2,3-Trichlorobenzene	ND	0.0139		mg/Kg-dry	1	4/24/2015 4:18:00 AM
Surr: Dibromofluoromethane	94.6	63.7-129		%REC	1	4/24/2015 4:18:00 AM
Surr: Toluene-d8	95.6	64.3-131		%REC	1	4/24/2015 4:18:00 AM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	4/24/2015 4:18:00 AM

Mercury by EPA Method 7471

Batch ID: 10632

Analyst: TN

Mercury	ND	0.333		mg/Kg-dry	1	4/27/2015 2:05:16 PM
---------	----	-------	--	-----------	---	----------------------

Total Metals by EPA Method 6020

Batch ID: 10621

Analyst: TN

Arsenic	5.68	0.105		mg/Kg-dry	1	4/24/2015 5:34:58 PM
Cadmium	ND	0.210		mg/Kg-dry	1	4/24/2015 5:34:58 PM
Chromium	49.6	0.105		mg/Kg-dry	1	4/24/2015 5:34:58 PM
Lead	3.71	0.210		mg/Kg-dry	1	4/24/2015 5:34:58 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985

Analyst: CG

Percent Moisture	24.9			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	MB-10621	SampType:	MBLK	Units:	mg/Kg	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	MBLKS	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417496		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	ND	0.100									
Cadmium	ND	0.200									
Chromium	ND	0.100									
Lead	ND	0.200									

Sample ID	LCS-10621	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	LCSS	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417497		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	173	0.100	161.0	0	107	70.8	129.8				
Cadmium	199	0.200	190.0	0	105	73.2	126.3				
Chromium	108	0.100	87.90	0	123	69.1	130.8				
Lead	147	0.200	138.0	0	107	73.2	127.5				

Sample ID	1504151-004ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	B-20-32-8.5	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417499		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	5.46	0.110						7.840	35.8	20	R
Cadmium	ND	0.221						0		20	
Chromium	66.0	0.110						81.67	21.3	20	R
Lead	5.62	0.221						6.647	16.7	20	

NOTES:

R - High RPD observed. The method is in control as indicated by the laboratory control sample (LCS).

Sample ID	1504151-004AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	B-20-32-8.5	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417501		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	61.9	0.110	55.20	7.840	97.9	75	125				
Cadmium	2.86	0.221	2.760	0.02622	103	75	125				



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1504151-004AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 4/24/2015	RunNo: 21995					
Client ID: B-20-32-8.5	Batch ID: 10621				Analysis Date: 4/24/2015	SeqNo: 417501					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	154	0.110	55.20	81.67	132	75	125				S
Lead	37.5	0.221	27.60	6.647	112	75	125				

NOTES:

S - Outlying spike recovery observed. MSD recovered within specification.

Sample ID 1504151-004AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 4/24/2015	RunNo: 21995					
Client ID: B-20-32-8.5	Batch ID: 10621				Analysis Date: 4/24/2015	SeqNo: 417504					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	59.5	0.110	55.20	7.840	93.6	75	125	61.90	3.91	20	
Cadmium	2.69	0.221	2.760	0.02622	96.4	75	125	2.865	6.44	20	
Chromium	137	0.110	55.20	81.67	99.7	75	125	154.5	12.2	20	
Lead	34.8	0.221	27.60	6.647	102	75	125	37.50	7.41	20	

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-10632	SampType: MBLK	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22016							
Client ID: MBLKS	Batch ID: 10632		Analysis Date: 4/27/2015	SeqNo: 417926							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID LCS-10632	SampType: LCS	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22016							
Client ID: LCSS	Batch ID: 10632		Analysis Date: 4/27/2015	SeqNo: 417927							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 5.85 0.250 5.000 0 117 80 120

Sample ID 1504228-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 4/27/2015	RunNo: 22016							
Client ID: BATCH	Batch ID: 10632		Analysis Date: 4/27/2015	SeqNo: 417929							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.301 0 20

Sample ID 1504228-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 4/27/2015	RunNo: 22016							
Client ID: BATCH	Batch ID: 10632		Analysis Date: 4/27/2015	SeqNo: 417930							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.725 0.306 0.6127 0.03836 112 70 130

Sample ID 1504228-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 4/27/2015	RunNo: 22016							
Client ID: BATCH	Batch ID: 10632		Analysis Date: 4/27/2015	SeqNo: 417950							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.733 0.306 0.6127 0.03836 113 70 130 0.7254 1.01 20



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Metals (SW6020) with TCLP Extraction (EPA 1311)

Sample ID MB-10620	SampType: MBLK	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: MBLKS	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417628					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead ND 0.500

Sample ID LCS-10620	SampType: LCS	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: LCSS	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417631					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 2.46 0.500 2.500 0 98.4 65 135

Sample ID 1504151-009ADUP	SampType: DUP	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: B-20-28-6.0	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417633					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead ND 0.500 0 30

Sample ID 1504151-009AMS	SampType: MS	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: B-20-28-6.0	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417634					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 2.48 0.500 2.500 0.08627 95.7 65 135

Sample ID 1504151-009AMSD	SampType: MSD	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: B-20-28-6.0	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417640					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 2.45 0.500 2.500 0.08627 94.7 65 135 2.478 0.954 30

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1504151-032ADUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 4/23/2015	RunNo: 21984				
Client ID: B-20-26-3.5	Batch ID: 10615					Analysis Date: 4/23/2015	SeqNo: 417289				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	21.8						0		30	
Heavy Oil	ND	54.6						0		30	
Surr: 2-Fluorobiphenyl	20.0		21.82		91.7	50	150		0		
Surr: o-Terphenyl	20.4		21.82		93.6	50	150		0		

Sample ID LCS-10615	SampType: LCS	Units: mg/Kg				Prep Date: 4/23/2015	RunNo: 21984				
Client ID: LCSS	Batch ID: 10615					Analysis Date: 4/23/2015	SeqNo: 417306				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	486	20.0	500.0	0	97.2	65	135				
Surr: 2-Fluorobiphenyl	19.5		20.00		97.5	50	150				
Surr: o-Terphenyl	23.5		20.00		118	50	150				

Sample ID MB-10615	SampType: MBLK	Units: mg/Kg				Prep Date: 4/23/2015	RunNo: 21984				
Client ID: MBLKS	Batch ID: 10615					Analysis Date: 4/23/2015	SeqNo: 417307				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	19.3		20.00		96.6	50	150				
Surr: o-Terphenyl	19.2		20.00		96.0	50	150				

Work Order: 1504151
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	1504192-001ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	4/23/2015	RunNo:	22048		
Client ID:	BATCH	Batch ID:	10614	Analysis Date:	4/27/2015	SeqNo:	418547				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	55.1						0		30	
2-Methylnaphthalene	ND	55.1						0		30	
1-Methylnaphthalene	ND	55.1						0		30	
Acenaphthylene	ND	55.1						0		30	
Acenaphthene	ND	55.1						0		30	
Fluorene	ND	55.1						0		30	
Phenanthrene	ND	55.1						0		30	
Anthracene	ND	55.1						0		30	
Fluoranthene	ND	55.1						0		30	
Pyrene	ND	55.1						0		30	
Benz(a)anthracene	ND	55.1						0		30	
Chrysene	ND	55.1						0		30	
Benzo(b)fluoranthene	ND	55.1						0		30	
Benzo(k)fluoranthene	ND	55.1						0		30	
Benzo(a)pyrene	ND	55.1						0		30	
Indeno(1,2,3-cd)pyrene	ND	55.1						0		30	
Dibenz(a,h)anthracene	ND	55.1						0		30	
Benzo(g,h,i)perylene	ND	55.1						0		30	
Surr: 2-Fluorobiphenyl	484		550.9		87.9	42.7	132		0		
Surr: Terphenyl-d14 (surr)	545		550.9		99.0	48.8	157		0		

Sample ID	1504192-002AMS	SampType:	MS	Units:	µg/Kg-dry	Prep Date:	4/23/2015	RunNo:	22048		
Client ID:	BATCH	Batch ID:	10614	Analysis Date:	4/27/2015	SeqNo:	418549				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,070	56.9	1,139	0	93.9	42.9	138				
2-Methylnaphthalene	982	56.9	1,139	0	86.3	42.8	151				
1-Methylnaphthalene	862	56.9	1,139	0	75.7	41.6	148				
Acenaphthylene	1,010	56.9	1,139	0	88.8	32.6	160				
Acenaphthene	1,200	56.9	1,139	0	106	46.3	142				
Fluorene	1,210	56.9	1,139	0	106	43.4	153				



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1504192-002AMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 4/23/2015	RunNo: 22048							
Client ID: BATCH	Batch ID: 10614		Analysis Date: 4/27/2015	SeqNo: 418549							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenanthrene	1,130	56.9	1,139	0	99.5	45.5	140				
Anthracene	1,090	56.9	1,139	0	96.0	32.6	160				
Fluoranthene	1,030	56.9	1,139	0	90.6	44.6	161				
Pyrene	1,010	56.9	1,139	0	88.7	48.3	158				
Benz(a)anthracene	1,080	56.9	1,139	0	95.2	57.5	169				
Chrysene	1,180	56.9	1,139	0	104	45.2	146				
Benzo(b)fluoranthene	1,540	56.9	1,139	0	135	42.2	168				
Benzo(k)fluoranthene	1,290	56.9	1,139	0	113	48	161				
Benzo(a)pyrene	1,190	56.9	1,139	0	105	34.4	179				
Indeno(1,2,3-cd)pyrene	1,320	56.9	1,139	0	116	41.1	165				
Dibenz(a,h)anthracene	1,420	56.9	1,139	0	125	38.1	166				
Benzo(g,h,i)perylene	1,280	56.9	1,139	0	112	45.6	157				
Surr: 2-Fluorobiphenyl	241		569.4		42.3	42.7	132				S
Surr: Terphenyl-d14 (surr)	506		569.4		88.9	48.8	157				

NOTES:

S - Outlying surrogate recovery observed. The method is in control as indicated by the LCS.

Sample ID LCS-10614	SampType: LCS	Units: µg/Kg	Prep Date: 4/23/2015	RunNo: 22048							
Client ID: LCSS	Batch ID: 10614		Analysis Date: 4/27/2015	SeqNo: 418559							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	962	50.0	1,000	0	96.2	61.6	125				
2-Methylnaphthalene	879	50.0	1,000	0	87.9	58.2	129				
1-Methylnaphthalene	933	50.0	1,000	0	93.3	56.4	132				
Acenaphthylene	883	50.0	1,000	0	88.3	52.2	133				
Acenaphthene	1,020	50.0	1,000	0	102	54	131				
Fluorene	1,000	50.0	1,000	0	100	53.4	131				
Phenanthrene	950	50.0	1,000	0	95.0	55.6	128				
Anthracene	914	50.0	1,000	0	91.4	51	132				
Fluoranthene	874	50.0	1,000	0	87.4	48.4	134				
Pyrene	864	50.0	1,000	0	86.4	48.6	135				
Benz(a)anthracene	906	50.0	1,000	0	90.6	41.9	136				

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	LCS-10614	SampType:	LCS	Units:	µg/Kg	Prep Date:	4/23/2015	RunNo:	22048		
Client ID:	LCSS	Batch ID:	10614	Analysis Date:	4/27/2015	SeqNo:	418559				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chrysene	1,010	50.0	1,000	0	101	51.4	135				
Benzo(b)fluoranthene	1,320	50.0	1,000	0	132	39.7	137				
Benzo(k)fluoranthene	1,090	50.0	1,000	0	109	45.7	138				
Benzo(a)pyrene	1,050	50.0	1,000	0	105	40.9	141				
Indeno(1,2,3-cd)pyrene	1,160	50.0	1,000	0	116	41	140				
Dibenz(a,h)anthracene	1,240	50.0	1,000	0	124	37.6	140				
Benzo(g,h,i)perylene	1,140	50.0	1,000	0	114	45	134				
Surr: 2-Fluorobiphenyl	446		500.0		89.1	42.7	132				
Surr: Terphenyl-d14 (surr)	444		500.0		88.8	48.8	157				

Sample ID	MB-10614	SampType:	MBLK	Units:	µg/Kg	Prep Date:	4/23/2015	RunNo:	22048		
Client ID:	MBLKS	Batch ID:	10614	Analysis Date:	4/27/2015	SeqNo:	418560				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	50.0									
2-Methylnaphthalene	ND	50.0									
1-Methylnaphthalene	ND	50.0									
Acenaphthylene	ND	50.0									
Acenaphthene	ND	50.0									
Fluorene	ND	50.0									
Phenanthrene	ND	50.0									
Anthracene	ND	50.0									
Fluoranthene	ND	50.0									
Pyrene	ND	50.0									
Benz(a)anthracene	ND	50.0									
Chrysene	ND	50.0									
Benzo(b)fluoranthene	ND	50.0									
Benzo(k)fluoranthene	ND	50.0									
Benzo(a)pyrene	ND	50.0									
Indeno(1,2,3-cd)pyrene	ND	50.0									
Dibenz(a,h)anthracene	ND	50.0									

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID MB-10614	SampType: MBLK	Units: µg/Kg	Prep Date: 4/23/2015	RunNo: 22048							
Client ID: MBLKS	Batch ID: 10614		Analysis Date: 4/27/2015	SeqNo: 418560							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzo(g,h,i)perylene	ND	50.0									
Surr: 2-Fluorobiphenyl	439		500.0		87.7	42.7	132				
Surr: Terphenyl-d14 (surr)	474		500.0		94.8	48.8	157				

Sample ID CCV-E-10614	SampType: CCV	Units: µg/L	Prep Date: 4/28/2015	RunNo: 22048							
Client ID: CCV	Batch ID: 10614		Analysis Date: 4/28/2015	SeqNo: 418766							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	1,010	50.0	1,000	0	101	80	120				
2-Methylnaphthalene	1,050	50.0	1,000	0	105	80	120				
1-Methylnaphthalene	1,010	50.0	1,000	0	101	80	120				
Phenanthrene	948	50.0	1,000	0	94.8	80	120				
Fluoranthene	974	50.0	1,000	0	97.4	80	120				
Pyrene	976	50.0	1,000	0	97.6	80	120				
Benz(a)anthracene	1,000	50.0	1,000	0	100	80	120				
Chrysene	1,200	50.0	1,000	0	120	80	120				
Benzo(b)fluoranthene	1,190	50.0	1,000	0	119	80	120				
Surr: 2-Fluorobiphenyl	540		500.0		108	50.4	142				
Surr: Terphenyl-d14 (surr)	478		500.0		95.6	48.8	157				

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID	1504152-013BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/23/2015	RunNo:	21988		
Client ID:	BATCH	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417375		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	3.49						0		30	
Gasoline Range Organics (C6-C12)	62.6	3.49						60.71	3.03	30	
Surr: Toluene-d8	0.803		0.8734		91.9	65	135		0		
Surr: 4-Bromofluorobenzene	0.839		0.8734		96.1	65	135		0		

NOTES:

GRO - Indicates the presence of unresolved compounds eluting from toluene to dodecane (~C7->C12).

Sample ID	LCS-10616	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21988		
Client ID:	LCSS	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417384		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	23.7	5.00	25.00	0	94.9	65	135				
Surr: Toluene-d8	1.18		1.250		94.7	65	135				
Surr: 4-Bromofluorobenzene	1.18		1.250		94.1	65	135				

Sample ID	MB-10616	SampType:	MBLK	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21988		
Client ID:	MBLKS	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417385		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.15		1.250		92.1	65	135				
Surr: 4-Bromofluorobenzene	1.16		1.250		92.9	65	135				

Sample ID	CCV-D-10616	SampType:	CCV	Units:	mg/Kg	Prep Date:	4/27/2015	RunNo:	21988		
Client ID:	CCV	Batch ID:	10616			Analysis Date:	4/27/2015	SeqNo:	417901		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	468	5.00	500.0	0	93.6	80	120				
Surr: Toluene-d8	23.8		25.00		95.0	65	135				
Surr: 4-Bromofluorobenzene	28.0		25.00		112	65	135				

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID 1504151-032BDUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 4/27/2015	RunNo: 22038				
Client ID: B-20-26-3.5	Batch ID: 10640					Analysis Date: 4/28/2015	SeqNo: 418383				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	2.46						0		30	
Surr: Toluene-d8	0.556		0.6159		90.2	65	135		0		
Surr: 4-Bromofluorobenzene	0.627		0.6159		102	65	135		0		

Sample ID 1504230-001BDUP	SampType: DUP	Units: mg/Kg				Prep Date: 4/27/2015	RunNo: 22038				
Client ID: BATCH	Batch ID: 10640					Analysis Date: 4/27/2015	SeqNo: 418391				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	4.53						0		30	
Surr: Toluene-d8	1.00		1.132		88.4	65	135		0		
Surr: 4-Bromofluorobenzene	1.25		1.132		110	65	135		0		

Sample ID LCS-10640	SampType: LCS	Units: mg/Kg				Prep Date: 4/27/2015	RunNo: 22038				
Client ID: LCSS	Batch ID: 10640					Analysis Date: 4/27/2015	SeqNo: 418404				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	23.0	5.00	25.00	0	92.0	65	135				
Surr: Toluene-d8	1.13		1.250		90.4	65	135				
Surr: 4-Bromofluorobenzene	1.33		1.250		107	65	135				

Sample ID MB-10640	SampType: MBLK	Units: mg/Kg				Prep Date: 4/27/2015	RunNo: 22038				
Client ID: MBLKS	Batch ID: 10640					Analysis Date: 4/27/2015	SeqNo: 418405				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.15		1.250		92.2	65	135				
Surr: 4-Bromofluorobenzene	1.36		1.250		109	65	135				



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	1504152-013BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	BATCH	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417358		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0419						0		30	
Chloromethane	ND	0.0419						0		30	
Vinyl chloride	ND	0.00140						0		30	
Bromomethane	ND	0.0629						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0349						0		30	
Chloroethane	ND	0.0419						0		30	
1,1-Dichloroethene	ND	0.0349						0		30	
Methylene chloride	ND	0.0140						0		30	
trans-1,2-Dichloroethene	ND	0.0140						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0349						0		30	
1,1-Dichloroethane	ND	0.0140						0		30	
2,2-Dichloropropane	ND	0.0349						0		30	
cis-1,2-Dichloroethene	ND	0.0140						0		30	
Chloroform	ND	0.0140						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0140						0		30	
1,1-Dichloropropene	ND	0.0140						0		30	
Carbon tetrachloride	ND	0.0140						0		30	
1,2-Dichloroethane (EDC)	ND	0.0210						0		30	
Benzene	ND	0.0140						0		30	
Trichloroethene (TCE)	ND	0.0140						0		30	
1,2-Dichloropropane	ND	0.0140						0		30	
Bromodichloromethane	ND	0.0140						0		30	
Dibromomethane	ND	0.0279						0		30	
cis-1,3-Dichloropropene	ND	0.0140						0		30	
Toluene	ND	0.0140						0		30	
trans-1,3-Dichloropropylene	ND	0.0210						0		30	
1,1,2-Trichloroethane	ND	0.0210						0		30	
1,3-Dichloropropane	ND	0.0349						0		30	
Tetrachloroethene (PCE)	ND	0.0140						0		30	
Dibromochloromethane	ND	0.0210						0		30	
1,2-Dibromoethane (EDB)	ND	0.00349						0		30	



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504152-013BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: BATCH	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417358							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chlorobenzene	ND	0.0140						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0210						0		30	
Ethylbenzene	ND	0.0210						0		30	
m,p-Xylene	0.0352	0.0140						0.03586	1.77	30	
o-Xylene	ND	0.0140						0		30	
Styrene	ND	0.0140						0		30	
Isopropylbenzene	ND	0.0559						0		30	
Bromoform	ND	0.0140						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0140						0		30	
n-Propylbenzene	0.165	0.0140						0.1659	0.433	30	
Bromobenzene	ND	0.0210						0		30	
1,3,5-Trimethylbenzene	0.0199	0.0140						0.02100	5.29	30	
2-Chlorotoluene	ND	0.0140						0		30	
4-Chlorotoluene	ND	0.0140						0		30	
tert-Butylbenzene	ND	0.0140						0		30	
1,2,3-Trichloropropane	ND	0.0140						0		30	
1,2,4-Trichlorobenzene	0.0587	0.0349						0.06478	9.86	30	
sec-Butylbenzene	0.0599	0.0140						0.06051	0.934	30	
4-Isopropyltoluene	0.0651	0.0140						0.06578	1.05	30	
1,3-Dichlorobenzene	ND	0.0140						0		30	
1,4-Dichlorobenzene	ND	0.0140						0		30	
n-Butylbenzene	0.253	0.0140						0.2554	0.928	30	
1,2-Dichlorobenzene	0.0462	0.0140						0.04425	4.28	30	
1,2-Dibromo-3-chloropropane	ND	0.349						0		30	
1,2,4-Trimethylbenzene	0.107	0.0140						0.1092	1.87	30	
Hexachlorobutadiene	ND	0.0699						0		30	
Naphthalene	0.0753	0.0210						0.09049	18.3	30	
1,2,3-Trichlorobenzene	ND	0.0140						0		30	
Surr: Dibromofluoromethane	0.903		0.8734		103	63.7	129		0		
Surr: Toluene-d8	0.918		0.8734		105	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.883		0.8734		101	63.1	141		0		



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504152-013BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: BATCH	Batch ID: 10616	Analysis Date: 4/23/2015	SeqNo: 417358								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID 1504152-014BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: BATCH	Batch ID: 10616	Analysis Date: 4/24/2015	SeqNo: 417360								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.521	0.0368	0.6132	0	84.9	43.5	121				
Chloromethane	0.563	0.0368	0.6132	0.004719	91.1	45	130				
Vinyl chloride	0.695	0.00123	0.6132	0	113	51.2	146				
Bromomethane	1.36	0.0552	0.6132	0	222	21.3	120				S
Trichlorofluoromethane (CFC-11)	1.19	0.0307	0.6132	0	195	35	131				S
Chloroethane	0.790	0.0368	0.6132	0	129	43.8	117				S
1,1-Dichloroethene	0.752	0.0307	0.6132	0	123	61.9	141				
Methylene chloride	0.631	0.0123	0.6132	0	103	54.7	142				
trans-1,2-Dichloroethene	0.743	0.0123	0.6132	0	121	52	136				
Methyl tert-butyl ether (MTBE)	0.644	0.0307	0.6132	0	105	54.4	132				
1,1-Dichloroethane	0.754	0.0123	0.6132	0	123	51.8	141				
2,2-Dichloropropane	0.799	0.0307	0.6132	0	130	36	123				S
cis-1,2-Dichloroethene	0.775	0.0123	0.6132	0	126	58.6	136				
Chloroform	0.659	0.0123	0.6132	0	107	53.2	129				
1,1,1-Trichloroethane (TCA)	0.749	0.0123	0.6132	0	122	58.3	145				
1,1-Dichloropropene	0.631	0.0123	0.6132	0	103	55.1	138				
Carbon tetrachloride	0.728	0.0123	0.6132	0	119	53.3	144				
1,2-Dichloroethane (EDC)	0.544	0.0184	0.6132	0	88.7	51.3	139				
Benzene	0.602	0.0123	0.6132	0.008858	96.8	63.5	133				
Trichloroethene (TCE)	0.710	0.0123	0.6132	0	116	68.6	132				
1,2-Dichloropropane	0.660	0.0123	0.6132	0	108	59	136				
Bromodichloromethane	0.742	0.0123	0.6132	0	121	50.7	141				
Dibromomethane	0.772	0.0245	0.6132	0	126	50.6	137				
cis-1,3-Dichloropropene	0.690	0.0123	0.6132	0	112	50.4	138				
Toluene	0.679	0.0123	0.6132	0.002542	110	63.4	132				
trans-1,3-Dichloropropylene	0.699	0.0184	0.6132	0	114	44.1	147				



Work Order: 1504151
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504152-014BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: BATCH	Batch ID: 10616		Analysis Date: 4/24/2015	SeqNo: 417360							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,2-Trichloroethane	0.652	0.0184	0.6132	0	106	51.6	137				
1,3-Dichloropropane	0.622	0.0307	0.6132	0	101	53.1	134				
Tetrachloroethene (PCE)	0.715	0.0123	0.6132	0	117	35.6	158				
Dibromochloromethane	0.733	0.0184	0.6132	0	120	55.3	140				
1,2-Dibromoethane (EDB)	0.760	0.00307	0.6132	0	124	50.4	136				
Chlorobenzene	0.581	0.0123	0.6132	0	94.8	60	133				
1,1,1,2-Tetrachloroethane	0.619	0.0184	0.6132	0	101	53.1	142				
Ethylbenzene	0.604	0.0184	0.6132	0	98.6	54.5	134				
m,p-Xylene	1.19	0.0123	1.226	0.001962	96.6	53.1	132				
o-Xylene	0.593	0.0123	0.6132	0	96.8	53.3	139				
Styrene	0.628	0.0123	0.6132	0	102	51.1	132				
Isopropylbenzene	0.625	0.0491	0.6132	0.02286	98.2	58.9	138				
Bromoform	0.805	0.0123	0.6132	0	131	57.9	130				S
1,1,2,2-Tetrachloroethane	0.678	0.0123	0.6132	0	111	51.9	131				
n-Propylbenzene	0.692	0.0123	0.6132	0.08050	99.7	53.6	140				
Bromobenzene	0.627	0.0184	0.6132	0	102	54.2	140				
1,3,5-Trimethylbenzene	0.611	0.0123	0.6132	0	99.6	51.8	136				
2-Chlorotoluene	0.624	0.0123	0.6132	0	102	51.6	136				
4-Chlorotoluene	0.611	0.0123	0.6132	0	99.7	50.1	139				
tert-Butylbenzene	0.613	0.0123	0.6132	0	99.9	50.5	135				
1,2,3-Trichloropropane	0.568	0.0123	0.6132	0	92.6	50.5	131				
1,2,4-Trichlorobenzene	0.540	0.0307	0.6132	0	88.0	50.8	130				
sec-Butylbenzene	0.652	0.0123	0.6132	0.02361	102	52.6	141				
4-Isopropyltoluene	0.625	0.0123	0.6132	0.008858	100	52.9	134				
1,3-Dichlorobenzene	0.556	0.0123	0.6132	0	90.7	52.6	131				
1,4-Dichlorobenzene	0.556	0.0123	0.6132	0	90.7	52.9	129				
n-Butylbenzene	0.654	0.0123	0.6132	0.08020	93.5	52.6	130				
1,2-Dichlorobenzene	0.559	0.0123	0.6132	0.01566	88.6	55.8	129				
1,2-Dibromo-3-chloropropane	0.635	0.307	0.6132	0	104	40.5	131				
1,2,4-Trimethylbenzene	0.600	0.0123	0.6132	0	97.8	50.6	137				
Hexachlorobutadiene	0.624	0.0613	0.6132	0	102	40.6	158				



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504152-014BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: BATCH	Batch ID: 10616		Analysis Date: 4/24/2015	SeqNo: 417360							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	0.525	0.0184	0.6132	0	85.6	52.3	124				
1,2,3-Trichlorobenzene	0.522	0.0123	0.6132	0	85.2	54.4	124				
Surr: Dibromofluoromethane	0.814		0.7665		106	63.7	129				
Surr: Toluene-d8	0.855		0.7665		111	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	0.807		0.7665		105	63.1	141				

NOTES:

S - Outlying QC recoveries were observed. The method is in control as indicated by the LCS.

Sample ID LCS-10616	SampType: LCS	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: LCSS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417368							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.762	0.0600	1.000	0	76.2	37.2	139				
Chloromethane	0.813	0.0600	1.000	0	81.3	38.8	132				
Vinyl chloride	0.940	0.00200	1.000	0	94.0	56.1	130				
Bromomethane	1.86	0.0900	1.000	0	186	41.3	148				S
Trichlorofluoromethane (CFC-11)	1.22	0.0500	1.000	0	122	42.9	147				
Chloroethane	1.03	0.0600	1.000	0	103	37.1	144				
1,1-Dichloroethene	0.877	0.0500	1.000	0	87.7	49.7	142				
Methylene chloride	0.975	0.0200	1.000	0	97.5	46.3	140				
trans-1,2-Dichloroethene	1.10	0.0200	1.000	0	110	68	130				
Methyl tert-butyl ether (MTBE)	1.01	0.0500	1.000	0	101	59.1	138				
1,1-Dichloroethane	1.01	0.0200	1.000	0	101	65.5	132				
2,2-Dichloropropane	1.22	0.0500	1.000	0	122	28.1	149				
cis-1,2-Dichloroethene	1.07	0.0200	1.000	0	107	71.3	135				
Chloroform	0.984	0.0200	1.000	0	98.4	67.5	129				
1,1,1-Trichloroethane (TCA)	1.09	0.0200	1.000	0	109	69	132				
1,1-Dichloropropene	0.959	0.0200	1.000	0	95.9	72.7	131				
Carbon tetrachloride	1.02	0.0200	1.000	0	102	63.4	137				
1,2-Dichloroethane (EDC)	0.912	0.0300	1.000	0	91.2	61.9	136				
Benzene	0.946	0.0200	1.000	0	94.6	64.3	133				
Trichloroethene (TCE)	0.942	0.0200	1.000	0	94.2	65.5	137				

Work Order: 1504151
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	LCS-10616	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	LCSS	Batch ID:	10616	Analysis Date:	4/23/2015	SeqNo:	417368				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dichloropropane	0.808	0.0200	1.000	0	80.8	63.2	142				
Bromodichloromethane	0.997	0.0200	1.000	0	99.7	73.2	131				
Dibromomethane	1.04	0.0400	1.000	0	104	70	130				
cis-1,3-Dichloropropene	0.977	0.0200	1.000	0	97.7	59.1	143				
Toluene	0.920	0.0200	1.000	0	92.0	67.3	138				
trans-1,3-Dichloropropylene	0.989	0.0300	1.000	0	98.9	49.2	149				
1,1,2-Trichloroethane	0.897	0.0300	1.000	0	89.7	74.5	129				
1,3-Dichloropropane	0.874	0.0500	1.000	0	87.4	70	130				
Tetrachloroethene (PCE)	0.916	0.0200	1.000	0	91.6	52.7	150				
Dibromochloromethane	0.990	0.0300	1.000	0	99.0	70.6	144				
1,2-Dibromoethane (EDB)	1.04	0.00500	1.000	0	104	70	130				
Chlorobenzene	0.936	0.0200	1.000	0	93.6	76.1	123				
1,1,1,2-Tetrachloroethane	0.971	0.0300	1.000	0	97.1	74.8	131				
Ethylbenzene	0.955	0.0300	1.000	0	95.5	74	129				
m,p-Xylene	1.91	0.0200	2.000	0	95.4	79.8	128				
o-Xylene	0.952	0.0200	1.000	0	95.2	72.7	124				
Styrene	1.01	0.0200	1.000	0	101	76.8	130				
Isopropylbenzene	0.948	0.0800	1.000	0	94.8	70	130				
Bromoform	1.21	0.0200	1.000	0	121	67	154				
1,1,1,2,2-Tetrachloroethane	1.12	0.0200	1.000	0	112	60	130				
n-Propylbenzene	0.971	0.0200	1.000	0	97.1	74.8	125				
Bromobenzene	1.00	0.0300	1.000	0	100	49.2	144				
1,3,5-Trimethylbenzene	0.968	0.0200	1.000	0	96.8	74.6	123				
2-Chlorotoluene	0.986	0.0200	1.000	0	98.6	76.7	129				
4-Chlorotoluene	0.972	0.0200	1.000	0	97.2	77.5	125				
tert-Butylbenzene	0.954	0.0200	1.000	0	95.4	66.2	130				
1,2,3-Trichloropropane	0.910	0.0200	1.000	0	91.0	67.9	136				
1,2,4-Trichlorobenzene	0.840	0.0500	1.000	0	84.0	65.6	137				
sec-Butylbenzene	0.981	0.0200	1.000	0	98.1	75.6	133				
4-Isopropyltoluene	0.949	0.0200	1.000	0	94.9	76.8	131				
1,3-Dichlorobenzene	0.896	0.0200	1.000	0	89.6	72.8	128				

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	LCS-10616	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	LCSS	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417368		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,4-Dichlorobenzene	0.896	0.0200	1.000	0	89.6	72.6	126				
n-Butylbenzene	0.905	0.0200	1.000	0	90.5	65.3	136				
1,2-Dichlorobenzene	0.895	0.0200	1.000	0	89.5	72.8	126				
1,2-Dibromo-3-chloropropane	0.924	0.500	1.000	0	92.4	61.2	139				
1,2,4-Trimethylbenzene	0.950	0.0200	1.000	0	95.0	77.5	129				
Hexachlorobutadiene	0.998	0.100	1.000	0	99.8	42	151				
Naphthalene	0.806	0.0300	1.000	0	80.6	62.3	134				
1,2,3-Trichlorobenzene	0.806	0.0200	1.000	0	80.6	62.1	140				
Surr: Dibromofluoromethane	1.28		1.250		102	63.7	129				
Surr: Toluene-d8	1.19		1.250		95.5	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.31		1.250		105	63.1	141				

NOTES:

S - Outlying QC recoveries were observed (Bromomethane; high bias). Samples are non-detect for this analyte, no further action required.

Sample ID	MB-10616	SampType:	MBLK	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	MBLKS	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417369		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	ND	0.0600									
Chloromethane	ND	0.0600									
Vinyl chloride	ND	0.00200									
Bromomethane	ND	0.0900									
Trichlorofluoromethane (CFC-11)	ND	0.0500									
Chloroethane	ND	0.0600									
1,1-Dichloroethene	ND	0.0500									
Methylene chloride	ND	0.0200									
trans-1,2-Dichloroethene	ND	0.0200									
Methyl tert-butyl ether (MTBE)	ND	0.0500									
1,1-Dichloroethane	ND	0.0200									
2,2-Dichloropropane	ND	0.0500									
cis-1,2-Dichloroethene	ND	0.0200									
Chloroform	ND	0.0200									

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID MB-10616	SampType: MBLK	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21987
Client ID: MBLKS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417369

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane (TCA)	ND	0.0200									
1,1-Dichloropropene	ND	0.0200									
Carbon tetrachloride	ND	0.0200									
1,2-Dichloroethane (EDC)	ND	0.0300									
Benzene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									
1,2-Dichloropropane	ND	0.0200									
Bromodichloromethane	ND	0.0200									
Dibromomethane	ND	0.0400									
cis-1,3-Dichloropropene	ND	0.0200									
Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									
1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									



Date: 4/30/2015

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID MB-10616	SampType: MBLK	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: MBLKS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417369							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									
sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									
1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									
1,2-Dichlorobenzene	ND	0.0200									
1,2-Dibromo-3-chloropropane	ND	0.500									
1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.13		1.250		90.1	63.7	129				
Surr: Toluene-d8	1.18		1.250		94.7	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.26		1.250		101	63.1	141				

Sample ID 1504151-032BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: B-20-26-3.5	Batch ID: 10640		Analysis Date: 4/28/2015	SeqNo: 418356							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0296						0		30	
Chloromethane	ND	0.0296						0		30	
Vinyl chloride	ND	0.000985						0		30	
Bromomethane	ND	0.0443						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0246						0		30	
Chloroethane	ND	0.0296						0		30	
1,1-Dichloroethene	ND	0.0246						0		30	
Methylene chloride	ND	0.00985						0		30	
trans-1,2-Dichloroethene	ND	0.00985						0		30	



Date: 4/30/2015

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504151-032BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: B-20-26-3.5	Batch ID: 10640		Analysis Date: 4/28/2015	SeqNo: 418356							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Methyl tert-butyl ether (MTBE)	ND	0.0246						0		30	
1,1-Dichloroethane	ND	0.00985						0		30	
2,2-Dichloropropane	ND	0.0246						0		30	
cis-1,2-Dichloroethene	ND	0.00985						0		30	
Chloroform	ND	0.00985						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.00985						0		30	
1,1-Dichloropropene	ND	0.00985						0		30	
Carbon tetrachloride	ND	0.00985						0		30	
1,2-Dichloroethane (EDC)	ND	0.0148						0		30	
Benzene	ND	0.00985						0		30	
Trichloroethene (TCE)	ND	0.00985						0		30	
1,2-Dichloropropane	ND	0.00985						0		30	
Bromodichloromethane	ND	0.00985						0		30	
Dibromomethane	ND	0.0197						0		30	
cis-1,3-Dichloropropene	ND	0.00985						0		30	
Toluene	ND	0.00985						0		30	
trans-1,3-Dichloropropylene	ND	0.0148						0		30	
1,1,2-Trichloroethane	ND	0.0148						0		30	
1,3-Dichloropropane	ND	0.0246						0		30	
Tetrachloroethene (PCE)	ND	0.00985						0		30	
Dibromochloromethane	ND	0.0148						0		30	
1,2-Dibromoethane (EDB)	ND	0.00246						0		30	
Chlorobenzene	ND	0.00985						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0148						0		30	
Ethylbenzene	ND	0.0148						0		30	
m,p-Xylene	ND	0.00985						0		30	
o-Xylene	ND	0.00985						0		30	
Styrene	ND	0.00985						0		30	
Isopropylbenzene	ND	0.0394						0		30	
Bromoform	ND	0.00985						0		30	
1,1,2,2-Tetrachloroethane	ND	0.00985						0		30	



Date: 4/30/2015

Work Order: 1504151
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	1504151-032BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/27/2015	RunNo:	22037		
Client ID:	B-20-26-3.5	Batch ID:	10640	Analysis Date:	4/28/2015	SeqNo:	418356				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Propylbenzene	ND	0.00985						0		30	
Bromobenzene	ND	0.0148						0		30	
1,3,5-Trimethylbenzene	ND	0.00985						0		30	
2-Chlorotoluene	ND	0.00985						0		30	
4-Chlorotoluene	ND	0.00985						0		30	
tert-Butylbenzene	ND	0.00985						0		30	
1,2,3-Trichloropropane	ND	0.00985						0		30	
1,2,4-Trichlorobenzene	ND	0.0246						0		30	
sec-Butylbenzene	ND	0.00985						0		30	
4-Isopropyltoluene	ND	0.00985						0		30	
1,3-Dichlorobenzene	ND	0.00985						0		30	
1,4-Dichlorobenzene	ND	0.00985						0		30	
n-Butylbenzene	ND	0.00985						0		30	
1,2-Dichlorobenzene	ND	0.00985						0		30	
1,2-Dibromo-3-chloropropane	ND	0.246						0		30	
1,2,4-Trimethylbenzene	ND	0.00985						0		30	
Hexachlorobutadiene	ND	0.0493						0		30	
Naphthalene	ND	0.0148						0		30	
1,2,3-Trichlorobenzene	ND	0.00985						0		30	
Surr: Dibromofluoromethane	0.592		0.6159		96.2	63.7	129		0		
Surr: Toluene-d8	0.595		0.6159		96.6	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.588		0.6159		95.4	63.1	141		0		

Sample ID	1504230-001BDUP	SampType:	DUP	Units:	mg/Kg	Prep Date:	4/27/2015	RunNo:	22037		
Client ID:	BATCH	Batch ID:	10640	Analysis Date:	4/27/2015	SeqNo:	418364				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	ND	0.0543						0		30	
Chloromethane	ND	0.0543						0		30	
Vinyl chloride	ND	0.00181						0		30	
Bromomethane	ND	0.0815						0		30	



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID: 1504230-001BDUP	SampType: DUP	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: BATCH	Batch ID: 10640		Analysis Date: 4/27/2015	SeqNo: 418364							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichlorofluoromethane (CFC-11)	ND	0.0453						0		30	
Chloroethane	ND	0.0543						0		30	
1,1-Dichloroethene	ND	0.0453						0		30	
Methylene chloride	ND	0.0181						0		30	
trans-1,2-Dichloroethene	ND	0.0181						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0453						0		30	
1,1-Dichloroethane	ND	0.0181						0		30	
2,2-Dichloropropane	ND	0.0453						0		30	
cis-1,2-Dichloroethene	ND	0.0181						0		30	
Chloroform	ND	0.0181						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0181						0		30	
1,1-Dichloropropene	ND	0.0181						0		30	
Carbon tetrachloride	ND	0.0181						0		30	
1,2-Dichloroethane (EDC)	ND	0.0272						0		30	
Benzene	ND	0.0181						0		30	
Trichloroethene (TCE)	ND	0.0181						0		30	
1,2-Dichloropropane	ND	0.0181						0		30	
Bromodichloromethane	ND	0.0181						0		30	
Dibromomethane	ND	0.0362						0		30	
cis-1,3-Dichloropropene	ND	0.0181						0		30	
Toluene	ND	0.0181						0		30	
trans-1,3-Dichloropropylene	ND	0.0272						0		30	
1,1,2-Trichloroethane	ND	0.0272						0		30	
1,3-Dichloropropane	ND	0.0453						0		30	
Tetrachloroethene (PCE)	ND	0.0181						0		30	
Dibromochloromethane	ND	0.0272						0		30	
1,2-Dibromoethane (EDB)	ND	0.00453						0		30	
Chlorobenzene	ND	0.0181						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0272						0		30	
Ethylbenzene	ND	0.0272						0		30	
m,p-Xylene	ND	0.0181						0		30	



Date: 4/30/2015

Work Order: 1504151
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	1504230-001BDUP	SampType:	DUP	Units:	mg/Kg	Prep Date:	4/27/2015	RunNo:	22037		
Client ID:	BATCH	Batch ID:	10640	Analysis Date:	4/27/2015	SeqNo:	418364				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
o-Xylene	ND	0.0181						0		30	
Styrene	ND	0.0181						0		30	
Isopropylbenzene	ND	0.0725						0		30	
Bromoform	ND	0.0181						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0181						0		30	
n-Propylbenzene	ND	0.0181						0		30	
Bromobenzene	ND	0.0272						0		30	
1,3,5-Trimethylbenzene	ND	0.0181						0		30	
2-Chlorotoluene	ND	0.0181						0		30	
4-Chlorotoluene	ND	0.0181						0		30	
tert-Butylbenzene	ND	0.0181						0		30	
1,2,3-Trichloropropane	ND	0.0181						0		30	
1,2,4-Trichlorobenzene	ND	0.0453						0		30	
sec-Butylbenzene	ND	0.0181						0		30	
4-Isopropyltoluene	ND	0.0181						0		30	
1,3-Dichlorobenzene	ND	0.0181						0		30	
1,4-Dichlorobenzene	ND	0.0181						0		30	
n-Butylbenzene	ND	0.0181						0		30	
1,2-Dichlorobenzene	ND	0.0181						0		30	
1,2-Dibromo-3-chloropropane	ND	0.453						0		30	
1,2,4-Trimethylbenzene	ND	0.0181						0		30	
Hexachlorobutadiene	ND	0.0906						0		30	
Naphthalene	ND	0.0272						0		30	
1,2,3-Trichlorobenzene	ND	0.0181						0		30	
Surr: Dibromofluoromethane	1.12		1.132		99.2	63.7	129		0		
Surr: Toluene-d8	1.11		1.132		97.7	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.17		1.132		104	63.1	141		0		



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID: 1504230-002BMS	SampType: MS	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: BATCH	Batch ID: 10640		Analysis Date: 4/27/2015	SeqNo: 418366							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	1.29	0.0581	0.9690	0	133	43.5	121				S
Chloromethane	0.847	0.0581	0.9690	0	87.5	45	130				
Vinyl chloride	0.937	0.00194	0.9690	0	96.7	51.2	146				
Bromomethane	0.279	0.0872	0.9690	0	28.8	21.3	120				
Trichlorofluoromethane (CFC-11)	1.01	0.0484	0.9690	0	104	35	131				
Chloroethane	0.498	0.0581	0.9690	0	51.4	43.8	117				
1,1-Dichloroethene	0.865	0.0484	0.9690	0	89.3	61.9	141				
Methylene chloride	0.911	0.0194	0.9690	0	94.0	54.7	142				
trans-1,2-Dichloroethene	0.870	0.0194	0.9690	0	89.8	52	136				
Methyl tert-butyl ether (MTBE)	0.987	0.0484	0.9690	0	102	54.4	132				
1,1-Dichloroethane	0.827	0.0194	0.9690	0	85.4	51.8	141				
2,2-Dichloropropane	0.802	0.0484	0.9690	0	82.8	36	123				
cis-1,2-Dichloroethene	0.897	0.0194	0.9690	0	92.6	58.6	136				
Chloroform	0.906	0.0194	0.9690	0	93.5	53.2	129				
1,1,1-Trichloroethane (TCA)	1.04	0.0194	0.9690	0	107	58.3	145				
1,1-Dichloropropene	0.998	0.0194	0.9690	0	103	55.1	138				
Carbon tetrachloride	0.917	0.0194	0.9690	0	94.6	53.3	144				
1,2-Dichloroethane (EDC)	0.840	0.0291	0.9690	0	86.7	51.3	139				
Benzene	0.914	0.0194	0.9690	0	94.4	63.5	133				
Trichloroethene (TCE)	0.981	0.0194	0.9690	0	101	68.6	132				
1,2-Dichloropropane	0.901	0.0194	0.9690	0	93.0	59	136				
Bromodichloromethane	0.959	0.0194	0.9690	0	99.0	50.7	141				
Dibromomethane	0.927	0.0388	0.9690	0	95.7	50.6	137				
cis-1,3-Dichloropropene	0.965	0.0194	0.9690	0	99.6	50.4	138				
Toluene	0.911	0.0194	0.9690	0	94.0	63.4	132				
trans-1,3-Dichloropropylene	0.908	0.0291	0.9690	0	93.7	44.1	147				
1,1,2-Trichloroethane	0.963	0.0291	0.9690	0	99.4	51.6	137				
1,3-Dichloropropane	0.931	0.0484	0.9690	0	96.1	53.1	134				
Tetrachloroethene (PCE)	1.03	0.0194	0.9690	0	106	35.6	158				
Dibromochloromethane	0.910	0.0291	0.9690	0	94.0	55.3	140				
1,2-Dibromoethane (EDB)	0.909	0.00484	0.9690	0	93.8	50.4	136				



Work Order: 1504151
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID: 1504230-002BMS	SampType: MS	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: BATCH	Batch ID: 10640		Analysis Date: 4/27/2015	SeqNo: 418366							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	1.02	0.0194	0.9690	0	106	60	133				
1,1,1,2-Tetrachloroethane	0.891	0.0291	0.9690	0	92.0	53.1	142				
Ethylbenzene	1.04	0.0291	0.9690	0	107	54.5	134				
m,p-Xylene	2.01	0.0194	1.938	0	104	53.1	132				
o-Xylene	1.00	0.0194	0.9690	0	103	53.3	139				
Styrene	0.990	0.0194	0.9690	0	102	51.1	132				
Isopropylbenzene	1.04	0.0775	0.9690	0	108	58.9	138				
Bromoform	0.898	0.0194	0.9690	0	92.7	57.9	130				
1,1,2,2-Tetrachloroethane	1.06	0.0194	0.9690	0	110	51.9	131				
n-Propylbenzene	1.04	0.0194	0.9690	0	108	53.6	140				
Bromobenzene	0.942	0.0291	0.9690	0	97.2	54.2	140				
1,3,5-Trimethylbenzene	1.04	0.0194	0.9690	0	107	51.8	136				
2-Chlorotoluene	1.02	0.0194	0.9690	0	105	51.6	136				
4-Chlorotoluene	1.04	0.0194	0.9690	0	107	50.1	139				
tert-Butylbenzene	1.01	0.0194	0.9690	0	104	50.5	135				
1,2,3-Trichloropropane	0.948	0.0194	0.9690	0	97.8	50.5	131				
1,2,4-Trichlorobenzene	1.13	0.0484	0.9690	0	117	50.8	130				
sec-Butylbenzene	1.08	0.0194	0.9690	0	111	52.6	141				
4-Isopropyltoluene	1.07	0.0194	0.9690	0	111	52.9	134				
1,3-Dichlorobenzene	0.982	0.0194	0.9690	0	101	52.6	131				
1,4-Dichlorobenzene	0.938	0.0194	0.9690	0	96.8	52.9	129				
n-Butylbenzene	1.03	0.0194	0.9690	0	107	52.6	130				
1,2-Dichlorobenzene	0.965	0.0194	0.9690	0	99.6	55.8	129				
1,2-Dibromo-3-chloropropane	0.784	0.484	0.9690	0	81.0	40.5	131				
1,2,4-Trimethylbenzene	1.05	0.0194	0.9690	0	108	50.6	137				
Hexachlorobutadiene	1.15	0.0969	0.9690	0	119	40.6	158				
Naphthalene	1.01	0.0291	0.9690	0	104	52.3	124				
1,2,3-Trichlorobenzene	1.14	0.0194	0.9690	0	117	54.4	124				
Surr: Dibromofluoromethane	1.12		1.211		92.5	63.7	129				
Surr: Toluene-d8	1.17		1.211		96.3	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.24		1.211		103	63.1	141				

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504230-002BMS	SampType: MS	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: BATCH	Batch ID: 10640		Analysis Date: 4/27/2015	SeqNo: 418366							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

S - Outlying QC recoveries were observed. The method is in control as indicated by the LCS.

Sample ID LCS-10640	SampType: LCS	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: LCSS	Batch ID: 10640		Analysis Date: 4/27/2015	SeqNo: 418378							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.915	0.0600	1.000	0	91.5	37.2	139				
Chloromethane	0.779	0.0600	1.000	0	77.9	38.8	132				
Vinyl chloride	0.835	0.00200	1.000	0	83.5	56.1	130				
Bromomethane	0.630	0.0900	1.000	0	63.0	41.3	148				
Trichlorofluoromethane (CFC-11)	0.956	0.0500	1.000	0	95.6	42.9	147				
Chloroethane	0.985	0.0600	1.000	0	98.5	37.1	144				
1,1-Dichloroethene	0.872	0.0500	1.000	0	87.2	49.7	142				
Methylene chloride	0.890	0.0200	1.000	0	89.0	46.3	140				
trans-1,2-Dichloroethene	0.859	0.0200	1.000	0	85.9	68	130				
Methyl tert-butyl ether (MTBE)	1.08	0.0500	1.000	0	108	59.1	138				
1,1-Dichloroethane	0.862	0.0200	1.000	0	86.2	65.5	132				
2,2-Dichloropropane	0.964	0.0500	1.000	0	96.4	28.1	149				
cis-1,2-Dichloroethene	0.931	0.0200	1.000	0	93.1	71.3	135				
Chloroform	0.948	0.0200	1.000	0	94.8	67.5	129				
1,1,1-Trichloroethane (TCA)	1.07	0.0200	1.000	0	107	69	132				
1,1-Dichloropropene	0.972	0.0200	1.000	0	97.2	72.7	131				
Carbon tetrachloride	0.932	0.0200	1.000	0	93.2	63.4	137				
1,2-Dichloroethane (EDC)	0.984	0.0300	1.000	0	98.4	61.9	136				
Benzene	0.947	0.0200	1.000	0	94.7	64.3	133				
Trichloroethene (TCE)	1.01	0.0200	1.000	0	101	65.5	137				
1,2-Dichloropropane	0.930	0.0200	1.000	0	93.0	63.2	142				
Bromodichloromethane	1.01	0.0200	1.000	0	101	73.2	131				
Dibromomethane	0.959	0.0400	1.000	0	95.9	70	130				
cis-1,3-Dichloropropene	1.12	0.0200	1.000	0	112	59.1	143				
Toluene	0.976	0.0200	1.000	0	97.6	67.3	138				

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	LCS-10640	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/27/2015	RunNo:	22037		
Client ID:	LCSS	Batch ID:	10640	Analysis Date:	4/27/2015	SeqNo:	418378				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
trans-1,3-Dichloropropylene	1.05	0.0300	1.000	0	105	49.2	149				
1,1,2-Trichloroethane	1.05	0.0300	1.000	0	105	74.5	129				
1,3-Dichloropropane	1.00	0.0500	1.000	0	100	70	130				
Tetrachloroethene (PCE)	1.07	0.0200	1.000	0	107	52.7	150				
Dibromochloromethane	0.962	0.0300	1.000	0	96.2	70.6	144				
1,2-Dibromoethane (EDB)	1.01	0.00500	1.000	0	101	70	130				
Chlorobenzene	0.980	0.0200	1.000	0	98.0	76.1	123				
1,1,1,2-Tetrachloroethane	0.875	0.0300	1.000	0	87.5	74.8	131				
Ethylbenzene	0.970	0.0300	1.000	0	97.0	74	129				
m,p-Xylene	2.01	0.0200	2.000	0	101	79.8	128				
o-Xylene	0.969	0.0200	1.000	0	96.9	72.7	124				
Styrene	0.978	0.0200	1.000	0	97.9	76.8	130				
Isopropylbenzene	0.996	0.0800	1.000	0	99.6	70	130				
Bromoform	1.00	0.0200	1.000	0	100	67	154				
1,1,1,2,2-Tetrachloroethane	1.06	0.0200	1.000	0	106	60	130				
n-Propylbenzene	1.01	0.0200	1.000	0	101	74.8	125				
Bromobenzene	0.920	0.0300	1.000	0	92.0	49.2	144				
1,3,5-Trimethylbenzene	0.999	0.0200	1.000	0	99.9	74.6	123				
2-Chlorotoluene	0.963	0.0200	1.000	0	96.3	76.7	129				
4-Chlorotoluene	0.990	0.0200	1.000	0	99.0	77.5	125				
tert-Butylbenzene	0.956	0.0200	1.000	0	95.6	66.2	130				
1,2,3-Trichloropropane	0.937	0.0200	1.000	0	93.6	67.9	136				
1,2,4-Trichlorobenzene	1.15	0.0500	1.000	0	115	65.6	137				
sec-Butylbenzene	0.980	0.0200	1.000	0	98.0	75.6	133				
4-Isopropyltoluene	0.982	0.0200	1.000	0	98.2	76.8	131				
1,3-Dichlorobenzene	0.992	0.0200	1.000	0	99.2	72.8	128				
1,4-Dichlorobenzene	0.938	0.0200	1.000	0	93.8	72.6	126				
n-Butylbenzene	1.00	0.0200	1.000	0	100	65.3	136				
1,2-Dichlorobenzene	0.993	0.0200	1.000	0	99.3	72.8	126				
1,2-Dibromo-3-chloropropane	1.07	0.500	1.000	0	107	61.2	139				
1,2,4-Trimethylbenzene	0.986	0.0200	1.000	0	98.6	77.5	129				

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	LCS-10640	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/27/2015	RunNo:	22037		
Client ID:	LCSS	Batch ID:	10640	Analysis Date:	4/27/2015	SeqNo:	418378				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexachlorobutadiene	1.01	0.100	1.000	0	101	42	151				
Naphthalene	1.13	0.0300	1.000	0	113	62.3	134				
1,2,3-Trichlorobenzene	1.17	0.0200	1.000	0	117	62.1	140				
Surr: Dibromofluoromethane	1.22		1.250		97.9	63.7	129				
Surr: Toluene-d8	1.25		1.250		100	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.22		1.250		97.9	63.1	141				

Sample ID	MB-10640	SampType:	MBLK	Units:	mg/Kg	Prep Date:	4/27/2015	RunNo:	22037		
Client ID:	MBLKS	Batch ID:	10640	Analysis Date:	4/27/2015	SeqNo:	418379				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	ND	0.0600									
Chloromethane	ND	0.0600									
Vinyl chloride	ND	0.00200									
Bromomethane	ND	0.0900									
Trichlorofluoromethane (CFC-11)	ND	0.0500									
Chloroethane	ND	0.0600									
1,1-Dichloroethene	ND	0.0500									
Methylene chloride	ND	0.0200									
trans-1,2-Dichloroethene	ND	0.0200									
Methyl tert-butyl ether (MTBE)	ND	0.0500									
1,1-Dichloroethane	ND	0.0200									
2,2-Dichloropropane	ND	0.0500									
cis-1,2-Dichloroethene	ND	0.0200									
Chloroform	ND	0.0200									
1,1,1-Trichloroethane (TCA)	ND	0.0200									
1,1-Dichloropropene	ND	0.0200									
Carbon tetrachloride	ND	0.0200									
1,2-Dichloroethane (EDC)	ND	0.0300									
Benzene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									



Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID MB-10640	SampType: MBLK	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: MBLKS	Batch ID: 10640		Analysis Date: 4/27/2015	SeqNo: 418379							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2-Dichloropropane	ND	0.0200									
Bromodichloromethane	ND	0.0200									
Dibromomethane	ND	0.0400									
cis-1,3-Dichloropropene	ND	0.0200									
Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									
1,1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									
tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									
sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									

Work Order: 1504151
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID MB-10640	SampType: MBLK	Units: mg/Kg	Prep Date: 4/27/2015	RunNo: 22037							
Client ID: MBLKS	Batch ID: 10640		Analysis Date: 4/27/2015	SeqNo: 418379							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									
1,2-Dichlorobenzene	ND	0.0200									
1,2-Dibromo-3-chloropropane	ND	0.500									
1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.27		1.250		102	63.7	129				
Surr: Toluene-d8	1.24		1.250		99.3	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.28		1.250		102	63.1	141				

Client Name: GEI	Work Order Number: 1504151
Logged by: Clare Griggs	Date Received: 4/16/2015 2:45:00 PM

Chain of Custody

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

Log In

3. Coolers are present? Yes No NA
4. Shipping container/cooler in good condition? Yes No
5. Custody seals intact on shipping container/cooler? Yes No Not Required
6. Was an attempt made to cool the samples? Yes No NA
7. Were all coolers received at a temperature of >0°C to 10.0°C Yes No NA
- Please refer to item information.**
8. Sample(s) in proper container(s)? Yes No
9. Sufficient sample volume for indicated test(s)? Yes No
10. Are samples properly preserved? Yes No
11. Was preservative added to bottles? Yes No NA
12. Is the headspace in the VOA vials? Yes No NA
13. Did all samples containers arrive in good condition(unbroken)? Yes No
14. Does paperwork match bottle labels? Yes No
15. Are matrices correctly identified on Chain of Custody? Yes No
16. Is it clear what analyses were requested? Yes No
17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C	Condition
Cooler	13.8	
Sample	13.5	
Temp Blank	11.5	



Fremont
Analytical

3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Client: GEOTECHNICAL
Address: _____
City, State, Zip _____

Project Name: GEOTECHNICAL
Location: SEATTLE WA
Collected by: NATHAN SOLOMON

Date: 4.16.15
Page: 2 of 5

Laboratory Project No (Internal): _____
Project No: 20434-001-24

Reports To (PM): JESSICA SMITH Email: _____
*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	OX/BTEX	BTX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCD)	Pres/Hwy OR Range Organics (PX)	PAH (EPA 8270)	PCB (EPA 8270 SIM)	Metals** (6030 / 200.8)	Total (T) Dissolved (D)	Arsenic (CY***)	EDS (801.1)	Comments/Depth
1 B-20-28-11.0	4.16.15	810	SOIL													K
2 B-20-28-13.5		815														K
3 B-20-30-1.0		820														K
4 B-20-30-3.5		825														K
5 B-20-30-6.0		830														K
6 B-20-30-8.5		835														K
7 B-20-30-11.0		840														K
8 B-20-30-13.5		845														K
9 B-20-31-1.5		850														K
10 B-20-31-3.0		855														K

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

Special Remarks: _____
Sample Disposal: Return to Client Disposal by Lab (A fee may be assessed if samples are returned after 30 days)
Relinquished Date/Time: _____
Received Date/Time: 4.16.15 1445
Relinquished Date/Time: _____
Received Date/Time: 5/19/15 1445

TAT -> SameDay* NextDay* 2 Day 3 Day STD
*Please coordinate with the lab in advance



Fremont Analytical

3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Client: GREENENGINEERS
Address:
City, State, Zip

Tel:
Fax:

Reports To (PM): JESSICA SMITH

Project Name: BUCK 20 RUFUS 2.0

Location: SEATTLE WA

Collected by: NATHAN SOLOMAN

Project No: 20434-001-24

Laboratory Project No (Internal):

Page: 3 of 5

Date: 4.16.15

Chain of Custody Record

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

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GC/RTX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identifications (HCD)	Semi Vol (EPA 8270)	PCB (EPA 8082)	Metals ** (EPA 8210 - SIM)	Total (T) / Dioxin (D)	Anions (C) ***	ES (EPA 8211)	Lead (Pb)	Mercury (Hg)	Comments/Depth	
1 B-20-31-5.5	4.16.15	900	S															
2 B-20-31-8.0		905																
3 B-20-21-10.5		910																
4 B-20-31-13.0		915																
5 B-20-24-1.0		920																
6 B-20-29-2.5		925																
7 B-20-29-4.0		930																
8 B-20-29-8.5		935																
9 B-20-29-11.0		940																
10 B-20-29-13.5		945																

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

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

Special Remarks:

Sample Disposal: Return to Client Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Relinquished Date/Time: 4.16.15 14:45

Relinquished Signature: [Signature]

Received Date/Time: 04/16/15 14:45

Received Signature: [Signature]

TAT -> SameDay^ NextDay^ 2 Day 3 Day STD

*Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com



Fremont
Analytical

3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Client: SEEDS ENGINEERS

Address: _____

City, State, Zip _____

Tel: _____

Fax: _____

Reports To (PM): JESSICA SMITK

Project Name: BUCK 20 RUFUS 2.0

Location: SEATTLE WA

Collected by: NATHAN SOLOMON

Project No: 20434-061-24

Date: 4.16.15

Page: 4 of 5

Laboratory Project No (Internal): _____

Chain of Custody Record

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	OXARTX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCD)	SEMI VOL (EPA 8270)	PCB (EPA 8092)	Metals ** (EPA 8210 - SIM)	Total (T) / Dissolved (D)	Anions (C) ***	EDS (8011)	Comments/Depth
1 B-20-24-1.0		1055	S	(X)		(X)	(X)	(X)	(X)	(X)				4
2 B-20-24-3.5		1100	S	(X)		(X)	(X)	(X)	(X)	(X)				
3 B-20-24-6.0		1105	S	(X)		(X)	(X)	(X)	(X)	(X)				
4 B-20-24-7.5		1110	S	(X)		(X)	(X)	(X)	(X)	(X)				
5 B-20-24-1.5		1220	S	(X)		(X)	(X)	(X)	(X)	(X)				
6 B-20-24-1.0		1305	S	(X)		(X)	(X)	(X)	(X)	(X)				
7 B-20-24-3.5		1310	S	(X)		(X)	(X)	(X)	(X)	(X)				
8 B-20-24-5.0		1315	S	(X)		(X)	(X)	(X)	(X)	(X)				
9 B-20-24-7.5		1320	S	(X)		(X)	(X)	(X)	(X)	(X)				
10 B-20-24-8.5		1325	S	(X)		(X)	(X)	(X)	(X)	(X)				

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

***Anions (Circle): _____ O-Phosphate Fluoride Nitrate-Nitrite

Special Remarks: _____

Sample Disposal: Return to Client Disposal by Lab (A file may be assigned. Samples are retained after 30 days)

Relinquished Date/Time _____

Received Date/Time 4.16.15 1415

Relinquished Date/Time _____

Received Date/Time 4/16/15 14:45

TAT -> SameDay* NextDay* 2 Day 3 Day STD

*Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com



Fremont Analytical

3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Client: CAS ENGINEERS

Address:

City, State, Zip

Tel:

Fax:

Reports To (PM): JESSICA SMITH

Project No: 20434-001-24

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

Chain of Custody Record

Laboratory Project No (Internal): _____

Page: 5 of 5

Project Name: Block 20 RUFUS 2.0

Location: SEATTLE WA

Collected by: NATHAN SOLOMON

Project No: 20434-001-24

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Comments/Depth
1 TRIOBLANK - OILWAT	4.16.15	N/A	LIQUID	
2 TEMPOBLANK - OILWAT	4.16.15	N/A	LIQUID	
3				
4				
5				
6				
7				
8				
9				
10				

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

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

Special Remarks: _____

Sample Disposal: Return to Client Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Relinquished Date/Time: 4.16.15 1445 Received Date/Time: 4/16/15 14:45

Relinquished Date/Time: _____ Received Date/Time: _____

TAT -> SameDay* NextDay* 2 Day 3 Day STD
*Please coordinate with the lab in advance



3600 Fremont Ave. N.

Seattle, WA 98103

T: (206) 352-3790

F: (206) 352-7178

info@fremontanalytical.com

GeoEngineers

Jessica Smith
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Block 20 Rufus 2.0

Lab ID: 1504152

April 30, 2015

Attention Jessica Smith:

Fremont Analytical, Inc. received 33 sample(s) on 4/15/2015 for the analyses presented in the following report.

- Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.*
- Gasoline by NWTPH-Gx*
- Mercury (SW7470) with TCLP Extraction (EPA 1311)*
- Mercury by EPA Method 7471*
- Metals (SW6020) with TCLP Extraction (EPA 1311)*
- Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)*
- Sample Moisture (Percent Moisture)*
- Total Metals by EPA Method 6020*
- Volatile Organic Compounds by EPA Method 8260*

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

A handwritten signature in black ink, appearing to read "Mike Ridgeway".

Mike Ridgeway
President



Date: 04/30/2015

CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0
Lab Order: 1504152

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1504152-001	B-20-27-20.0	04/15/2015 10:45 AM	04/15/2015 4:40 PM
1504152-002	B-20-27-23.5	04/15/2015 10:40 AM	04/15/2015 4:40 PM
1504152-003	B-20-22-0.5	04/15/2015 11:15 AM	04/15/2015 4:40 PM
1504152-004	B-20-22-3.0	04/15/2015 11:20 AM	04/15/2015 4:40 PM
1504152-005	B-20-22-7.5	04/15/2015 11:30 AM	04/15/2015 4:40 PM
1504152-006	B-20-22-5.0	04/15/2015 11:25 AM	04/15/2015 4:40 PM
1504152-007	B-20-22-10.0	04/15/2015 11:35 AM	04/15/2015 4:40 PM
1504152-008	B-20-22-12.5	04/15/2015 11:40 AM	04/15/2015 4:40 PM
1504152-009	B-20-22-14.0	04/15/2015 11:45 AM	04/15/2015 4:40 PM
1504152-010	B-20-21-3.0	04/15/2015 12:40 PM	04/15/2015 4:40 PM
1504152-011	B-20-21-5.5	04/15/2015 12:45 PM	04/15/2015 4:40 PM
1504152-012	B-20-21-8.0	04/15/2015 12:50 PM	04/15/2015 4:40 PM
1504152-013	B-20-21-10.5	04/15/2015 12:55 PM	04/15/2015 4:40 PM
1504152-014	B-20-21-13.0	04/15/2015 1:00 PM	04/15/2015 4:40 PM
1504152-015	B-20-25-2.0	04/15/2015 1:45 PM	04/15/2015 4:40 PM
1504152-016	B-20-25-4.5	04/15/2015 1:50 PM	04/15/2015 4:40 PM
1504152-017	B-20-25-7.0	04/15/2015 1:55 PM	04/15/2015 4:40 PM
1504152-018	B-20-25-10.0	04/15/2015 2:00 PM	04/15/2015 4:40 PM
1504152-019	B-20-25-12.5	04/15/2015 2:05 PM	04/15/2015 4:40 PM
1504152-020	B-20-25-15.0	04/15/2015 2:10 PM	04/15/2015 4:40 PM
1504152-021	B-20-25-17.5	04/15/2015 2:15 PM	04/15/2015 4:40 PM
1504152-022	B-20-25-19.0	04/15/2015 2:20 PM	04/15/2015 4:40 PM
1504152-023	TRIPBLANK_041515		04/15/2015 4:40 PM
1504152-024	B-20-23-3.0	04/15/2015 8:50 AM	04/15/2015 4:40 PM
1504152-025	B-20-23-5.5	04/15/2015 9:10 AM	04/15/2015 4:40 PM
1504152-026	B-20-23-8.0	04/15/2015 9:20 AM	04/15/2015 4:40 PM
1504152-027	B-20-23-10.5	04/15/2015 9:40 AM	04/15/2015 4:40 PM
1504152-028	B-20-23-13.0	04/15/2015 10:00 AM	04/15/2015 4:40 PM
1504152-029	B-20-27-5.0	04/15/2015 10:15 AM	04/15/2015 4:40 PM
1504152-030	B-20-27-7.5	04/15/2015 10:20 AM	04/15/2015 4:40 PM
1504152-031	B-20-27-10.0	04/15/2015 10:25 AM	04/15/2015 4:40 PM
1504152-032	B-20-27-15.0	04/15/2015 10:30 AM	04/15/2015 4:40 PM
1504152-033	B-20-27-17.5	04/15/2015 10:35 AM	04/15/2015 4:40 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 11:30:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-005

Matrix: Soil

Client Sample ID: B-20-22-7.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 10615 Analyst: EC

Diesel (Fuel Oil)	ND	22.3		mg/Kg-dry	1	4/24/2015 12:52:00 AM
Heavy Oil	ND	55.7		mg/Kg-dry	1	4/24/2015 12:52:00 AM
Surr: 2-Fluorobiphenyl	88.1	50-150		%REC	1	4/24/2015 12:52:00 AM
Surr: o-Terphenyl	88.2	50-150		%REC	1	4/24/2015 12:52:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 10614 Analyst: NG

Naphthalene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
2-Methylnaphthalene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
1-Methylnaphthalene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Acenaphthylene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Acenaphthene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Fluorene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Phenanthrene	94.3	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Anthracene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Fluoranthene	127	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Pyrene	136	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Benz(a)anthracene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Chrysene	70.7	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Benzo(b)fluoranthene	80.4	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Benzo(k)fluoranthene	ND	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Benzo(a)pyrene	74.7	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Indeno(1,2,3-cd)pyrene	127	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Dibenz(a,h)anthracene	96.9	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Benzo(g,h,i)perylene	92.5	55.3		µg/Kg-dry	1	4/27/2015 9:16:00 PM
Surr: 2-Fluorobiphenyl	67.2	42.7-132		%REC	1	4/27/2015 9:16:00 PM
Surr: Terphenyl-d14 (surr)	84.7	48.8-157		%REC	1	4/27/2015 9:16:00 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	12.0			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504152
Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 12:55:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-013

Matrix: Soil

Client Sample ID: B-20-21-10.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 10615 Analyst: EC

Diesel (Fuel Oil)	ND	26.3		mg/Kg-dry	1	4/24/2015 1:24:00 AM
Heavy Oil	8,120	658	D	mg/Kg-dry	10	4/24/2015 2:35:00 PM
Surr: 2-Fluorobiphenyl	93.1	50-150		%REC	1	4/24/2015 1:24:00 AM
Surr: o-Terphenyl	101	50-150		%REC	1	4/24/2015 1:24:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 10614 Analyst: NG

Naphthalene	35,800	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
2-Methylnaphthalene	48,600	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
1-Methylnaphthalene	25,600	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
Acenaphthylene	2,270	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Acenaphthene	697	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Fluorene	1,230	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Phenanthrene	51,200	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
Anthracene	2,130	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Fluoranthene	66,300	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
Pyrene	67,100	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
Benz(a)anthracene	37,200	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
Chrysene	34,000	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
Benzo(b)fluoranthene	65,000	3,220	D	µg/Kg-dry	50	4/28/2015 5:33:00 PM
Benzo(k)fluoranthene	1,310	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Benzo(a)pyrene	2,240	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Indeno(1,2,3-cd)pyrene	584	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Dibenz(a,h)anthracene	234	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Benzo(g,h,i)perylene	367	64.3		µg/Kg-dry	1	4/27/2015 9:41:00 PM
Surr: 2-Fluorobiphenyl	72.9	42.7-132		%REC	1	4/27/2015 9:41:00 PM
Surr: Terphenyl-d14 (surr)	122	48.8-157		%REC	1	4/27/2015 9:41:00 PM

Gasoline by NWTPH-Gx

Batch ID: 10616 Analyst: BC

Gasoline	ND	3.49		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Gasoline Range Organics (C6-C12)	60.7	3.49		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Surr: Toluene-d8	91.9	65-135		%REC	1	4/23/2015 10:59:00 PM
Surr: 4-Bromofluorobenzene	96.9	65-135		%REC	1	4/23/2015 10:59:00 PM

NOTES:

GRO - Indicates the presence of unresolved compounds eluting from toluene to dodecane (~C7->C12).



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 12:55:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-013

Matrix: Soil

Client Sample ID: B-20-21-10.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260					Batch ID: 10616	Analyst: BC
Dichlorodifluoromethane (CFC-12)	ND	0.0419		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Chloromethane	ND	0.0419		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Vinyl chloride	ND	0.00140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Bromomethane	ND	0.0629		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Trichlorofluoromethane (CFC-11)	ND	0.0349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Chloroethane	ND	0.0419		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,1-Dichloroethene	ND	0.0349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Methylene chloride	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
trans-1,2-Dichloroethene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Methyl tert-butyl ether (MTBE)	ND	0.0349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,1-Dichloroethane	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
2,2-Dichloropropane	ND	0.0349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
cis-1,2-Dichloroethene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Chloroform	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,1,1-Trichloroethane (TCA)	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,1-Dichloropropene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Carbon tetrachloride	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2-Dichloroethane (EDC)	ND	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Benzene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Trichloroethene (TCE)	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2-Dichloropropane	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Bromodichloromethane	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Dibromomethane	ND	0.0279		mg/Kg-dry	1	4/23/2015 10:59:00 PM
cis-1,3-Dichloropropene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Toluene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
trans-1,3-Dichloropropylene	ND	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,1,2-Trichloroethane	ND	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,3-Dichloropropane	ND	0.0349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Tetrachloroethene (PCE)	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Dibromochloromethane	ND	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2-Dibromoethane (EDB)	ND	0.00349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Chlorobenzene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,1,1,2-Tetrachloroethane	ND	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Ethylbenzene	ND	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
m,p-Xylene	0.0359	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
o-Xylene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Styrene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Isopropylbenzene	ND	0.0559		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Bromoform	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 12:55:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-013

Matrix: Soil

Client Sample ID: B-20-21-10.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10616

Analyst: BC

1,1,2,2-Tetrachloroethane	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
n-Propylbenzene	0.166	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Bromobenzene	ND	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,3,5-Trimethylbenzene	0.0210	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
2-Chlorotoluene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
4-Chlorotoluene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
tert-Butylbenzene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2,3-Trichloropropane	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2,4-Trichlorobenzene	0.0648	0.0349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
sec-Butylbenzene	0.0605	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
4-Isopropyltoluene	0.0658	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,3-Dichlorobenzene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,4-Dichlorobenzene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
n-Butylbenzene	0.255	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2-Dichlorobenzene	0.0443	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2-Dibromo-3-chloropropane	ND	0.349		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2,4-Trimethylbenzene	0.109	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Hexachlorobutadiene	ND	0.0699		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Naphthalene	0.0905	0.0210		mg/Kg-dry	1	4/23/2015 10:59:00 PM
1,2,3-Trichlorobenzene	ND	0.0140		mg/Kg-dry	1	4/23/2015 10:59:00 PM
Surr: Dibromofluoromethane	97.0	63.7-129		%REC	1	4/23/2015 10:59:00 PM
Surr: Toluene-d8	95.7	64.3-131		%REC	1	4/23/2015 10:59:00 PM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	4/23/2015 10:59:00 PM

Mercury by EPA Method 7471

Batch ID: 10632

Analyst: TN

Mercury	ND	0.289		mg/Kg-dry	1	4/27/2015 2:06:52 PM
---------	----	-------	--	-----------	---	----------------------

Mercury (SW7470) with TCLP Extraction (EPA 1311)

Batch ID: 10623

Analyst: TN

Mercury	ND	0.00200		mg/L	1	4/24/2015 5:25:12 PM
---------	----	---------	--	------	---	----------------------

Total Metals by EPA Method 6020

Batch ID: 10621

Analyst: TN

Arsenic	4.85	0.103		mg/Kg-dry	1	4/24/2015 5:45:37 PM
Cadmium	0.603	0.206		mg/Kg-dry	1	4/24/2015 5:45:37 PM
Chromium	32.4	0.103		mg/Kg-dry	1	4/24/2015 5:45:37 PM
Lead	155	0.206		mg/Kg-dry	1	4/24/2015 5:45:37 PM



Analytical Report

WO#: 1504152
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 12:55:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-013

Matrix: Soil

Client Sample ID: B-20-21-10.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Metals (SW6020) with TCLP Extraction (EPA 1311)

Batch ID: 10620 Analyst: TN

Lead	ND	0.500		mg/L	1	4/24/2015 7:08:04 PM
------	----	-------	--	------	---	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	24.2			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504152
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 1:00:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-014

Matrix: Soil

Client Sample ID: B-20-21-13.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 10615 Analyst: EC

Diesel (Fuel Oil)	ND	25.1		mg/Kg-dry	1	4/24/2015 1:55:00 AM
Heavy Oil	1,170	62.8		mg/Kg-dry	1	4/24/2015 1:55:00 AM
Surr: 2-Fluorobiphenyl	86.5	50-150		%REC	1	4/24/2015 1:55:00 AM
Surr: o-Terphenyl	91.1	50-150		%REC	1	4/24/2015 1:55:00 AM

Gasoline by NWTPH-Gx

Batch ID: 10616 Analyst: BC

Gasoline	ND	3.07		mg/Kg-dry	1	4/24/2015 4:57:00 PM
Gasoline Range Organics (C6-C12)	9.36	3.07		mg/Kg-dry	1	4/24/2015 4:57:00 PM
Surr: Toluene-d8	94.5	65-135		%REC	1	4/24/2015 4:57:00 PM
Surr: 4-Bromofluorobenzene	96.1	65-135		%REC	1	4/24/2015 4:57:00 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	22.7			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 1:45:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-015

Matrix: Soil

Client Sample ID: B-20-25-2.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 10615 Analyst: EC

Diesel (Fuel Oil)	ND	20.8		mg/Kg-dry	1	4/24/2015 2:26:00 AM
Heavy Oil	1,510	52.0		mg/Kg-dry	1	4/24/2015 2:26:00 AM
Surr: 2-Fluorobiphenyl	101	50-150		%REC	1	4/24/2015 2:26:00 AM
Surr: o-Terphenyl	106	50-150		%REC	1	4/24/2015 2:26:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 10614 Analyst: NG

Naphthalene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
2-Methylnaphthalene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
1-Methylnaphthalene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Acenaphthylene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Acenaphthene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Fluorene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Phenanthrene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Anthracene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Fluoranthene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Pyrene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Benz(a)anthracene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Chrysene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Benzo(b)fluoranthene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Benzo(k)fluoranthene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Benzo(a)pyrene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Indeno(1,2,3-cd)pyrene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Dibenz(a,h)anthracene	ND	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Benzo(g,h,i)perylene	64.3	52.7		µg/Kg-dry	1	4/27/2015 10:06:00 PM
Surr: 2-Fluorobiphenyl	81.8	42.7-132		%REC	1	4/27/2015 10:06:00 PM
Surr: Terphenyl-d14 (surr)	101	48.8-157		%REC	1	4/27/2015 10:06:00 PM

Gasoline by NWTPH-Gx

Batch ID: 10616 Analyst: BC

Gasoline	ND	2.76		mg/Kg-dry	1	4/24/2015 1:53:00 AM
Surr: Toluene-d8	94.0	65-135		%REC	1	4/24/2015 1:53:00 AM
Surr: 4-Bromofluorobenzene	94.6	65-135		%REC	1	4/24/2015 1:53:00 AM

Mercury by EPA Method 7471

Batch ID: 10632 Analyst: TN

Mercury	ND	0.253		mg/Kg-dry	1	4/27/2015 2:20:25 PM
---------	----	-------	--	-----------	---	----------------------



Analytical Report

WO#: 1504152
 Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 1:45:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-015

Matrix: Soil

Client Sample ID: B-20-25-2.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 10621 Analyst: TN

Arsenic	2.34	0.0792		mg/Kg-dry	1	4/24/2015 5:49:09 PM
Cadmium	ND	0.158		mg/Kg-dry	1	4/24/2015 5:49:09 PM
Chromium	30.7	0.0792		mg/Kg-dry	1	4/24/2015 5:49:09 PM
Lead	7.94	0.158		mg/Kg-dry	1	4/24/2015 5:49:09 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	8.52			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 2:05:00 PM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-019

Matrix: Soil

Client Sample ID: B-20-25-12.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 10615 Analyst: EC

Diesel (Fuel Oil)	ND	20.3		mg/Kg-dry	1	4/24/2015 3:29:00 AM
Heavy Oil	ND	50.7		mg/Kg-dry	1	4/24/2015 3:29:00 AM
Surr: 2-Fluorobiphenyl	88.7	50-150		%REC	1	4/24/2015 3:29:00 AM
Surr: o-Terphenyl	91.9	50-150		%REC	1	4/24/2015 3:29:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 10614 Analyst: NG

Naphthalene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
2-Methylnaphthalene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
1-Methylnaphthalene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Acenaphthylene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Acenaphthene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Fluorene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Phenanthrene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Anthracene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Fluoranthene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Pyrene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Benz(a)anthracene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Chrysene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Benzo(b)fluoranthene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Benzo(k)fluoranthene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Benzo(a)pyrene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Indeno(1,2,3-cd)pyrene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Dibenz(a,h)anthracene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Benzo(g,h,i)perylene	ND	53.9		µg/Kg-dry	1	4/27/2015 10:31:00 PM
Surr: 2-Fluorobiphenyl	65.3	42.7-132		%REC	1	4/27/2015 10:31:00 PM
Surr: Terphenyl-d14 (surr)	99.0	48.8-157		%REC	1	4/27/2015 10:31:00 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	10.8			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 8:50:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-024

Matrix: Soil

Client Sample ID: B-20-23-3.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>					Batch ID: 10615	Analyst: EC
Diesel (Fuel Oil)	ND	19.6		mg/Kg-dry	1	4/24/2015 4:00:00 AM
Heavy Oil	934	49.1		mg/Kg-dry	1	4/24/2015 4:00:00 AM
Surr: 2-Fluorobiphenyl	117	50-150		%REC	1	4/24/2015 4:00:00 AM
Surr: o-Terphenyl	126	50-150		%REC	1	4/24/2015 4:00:00 AM
<u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u>					Batch ID: 10614	Analyst: NG
Naphthalene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
2-Methylnaphthalene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
1-Methylnaphthalene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Acenaphthylene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Acenaphthene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Fluorene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Phenanthrene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Anthracene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Fluoranthene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Pyrene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Benz(a)anthracene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Chrysene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Benzo(b)fluoranthene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Benzo(k)fluoranthene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Benzo(a)pyrene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Indeno(1,2,3-cd)pyrene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Dibenz(a,h)anthracene	ND	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Benzo(g,h,i)perylene	62.0	57.7		µg/Kg-dry	1	4/27/2015 10:55:00 PM
Surr: 2-Fluorobiphenyl	74.0	42.7-132		%REC	1	4/27/2015 10:55:00 PM
Surr: Terphenyl-d14 (surr)	103	48.8-157		%REC	1	4/27/2015 10:55:00 PM
<u>Gasoline by NWTPH-Gx</u>					Batch ID: 10616	Analyst: BC
Gasoline	ND	7.55		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Stoddard Solvent/Mineral Spirits	610	377	D	mg/Kg-dry	50	4/24/2015 6:54:00 PM
Surr: Toluene-d8	91.2	65-135		%REC	1	4/24/2015 2:22:00 AM
Surr: 4-Bromofluorobenzene	91.8	65-135		%REC	1	4/24/2015 2:22:00 AM
<u>Volatile Organic Compounds by EPA Method 8260</u>					Batch ID: 10616	Analyst: BC
Dichlorodifluoromethane (CFC-12)	ND	0.0906		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Chloromethane	ND	0.0906		mg/Kg-dry	1	4/24/2015 2:22:00 AM



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 8:50:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-024

Matrix: Soil

Client Sample ID: B-20-23-3.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10616

Analyst: BC

Vinyl chloride	ND	0.00302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Bromomethane	ND	0.136		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Chloroethane	ND	0.0906		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,1-Dichloroethene	ND	0.0755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Methylene chloride	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
trans-1,2-Dichloroethene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,1-Dichloroethane	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
2,2-Dichloropropane	ND	0.0755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
cis-1,2-Dichloroethene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Chloroform	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,1-Dichloropropene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Carbon tetrachloride	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2-Dichloroethane (EDC)	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Benzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Trichloroethene (TCE)	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2-Dichloropropane	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Bromodichloromethane	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Dibromomethane	ND	0.0604		mg/Kg-dry	1	4/24/2015 2:22:00 AM
cis-1,3-Dichloropropene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Toluene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
trans-1,3-Dichloropropylene	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,1,2-Trichloroethane	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,3-Dichloropropane	ND	0.0755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Tetrachloroethene (PCE)	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Dibromochloromethane	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2-Dibromoethane (EDB)	ND	0.00755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Chlorobenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Ethylbenzene	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
m,p-Xylene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
o-Xylene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Styrene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Isopropylbenzene	ND	0.121		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Bromoform	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,1,2,2-Tetrachloroethane	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
n-Propylbenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 8:50:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-024

Matrix: Soil

Client Sample ID: B-20-23-3.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260

Batch ID: 10616

Analyst: BC

Bromobenzene	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,3,5-Trimethylbenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
2-Chlorotoluene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
4-Chlorotoluene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
tert-Butylbenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2,3-Trichloropropane	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2,4-Trichlorobenzene	ND	0.0755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
sec-Butylbenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
4-Isopropyltoluene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,3-Dichlorobenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,4-Dichlorobenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
n-Butylbenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2-Dichlorobenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2-Dibromo-3-chloropropane	ND	0.755		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2,4-Trimethylbenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Hexachlorobutadiene	ND	0.151		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Naphthalene	ND	0.0453		mg/Kg-dry	1	4/24/2015 2:22:00 AM
1,2,3-Trichlorobenzene	ND	0.0302		mg/Kg-dry	1	4/24/2015 2:22:00 AM
Surr: Dibromofluoromethane	94.7	63.7-129		%REC	1	4/24/2015 2:22:00 AM
Surr: Toluene-d8	96.4	64.3-131		%REC	1	4/24/2015 2:22:00 AM
Surr: 1-Bromo-4-fluorobenzene	96.8	63.1-141		%REC	1	4/24/2015 2:22:00 AM

Mercury by EPA Method 7471

Batch ID: 10632

Analyst: TN

Mercury	ND	0.274		mg/Kg-dry	1	4/27/2015 2:22:02 PM
---------	----	-------	--	-----------	---	----------------------

Total Metals by EPA Method 6020

Batch ID: 10621

Analyst: TN

Arsenic	3.67	0.0854		mg/Kg-dry	1	4/24/2015 5:52:40 PM
Cadmium	ND	0.171		mg/Kg-dry	1	4/24/2015 5:52:40 PM
Chromium	38.2	0.0854		mg/Kg-dry	1	4/24/2015 5:52:40 PM
Lead	9.82	0.171		mg/Kg-dry	1	4/24/2015 5:52:40 PM

Sample Moisture (Percent Moisture)

Batch ID: R21985

Analyst: CG

Percent Moisture	13.9			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504152

Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 10:15:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-029

Matrix: Soil

Client Sample ID: B-20-27-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 10615

Analyst: EC

Diesel (Fuel Oil)	ND	20.5		mg/Kg-dry	1	4/24/2015 4:31:00 AM
Heavy Oil	226	51.4		mg/Kg-dry	1	4/24/2015 4:31:00 AM
Surr: 2-Fluorobiphenyl	95.2	50-150		%REC	1	4/24/2015 4:31:00 AM
Surr: o-Terphenyl	99.9	50-150		%REC	1	4/24/2015 4:31:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 10614

Analyst: NG

Naphthalene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
2-Methylnaphthalene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
1-Methylnaphthalene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Acenaphthylene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Acenaphthene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Fluorene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Phenanthrene	130	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Anthracene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Fluoranthene	204	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Pyrene	213	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Benz(a)anthracene	126	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Chrysene	135	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Benzo(b)fluoranthene	144	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Benzo(k)fluoranthene	ND	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Benzo(a)pyrene	107	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Indeno(1,2,3-cd)pyrene	164	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Dibenz(a,h)anthracene	98.2	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Benzo(g,h,i)perylene	134	53.7		µg/Kg-dry	1	4/27/2015 11:19:00 PM
Surr: 2-Fluorobiphenyl	79.2	42.7-132		%REC	1	4/27/2015 11:19:00 PM
Surr: Terphenyl-d14 (surr)	95.7	48.8-157		%REC	1	4/27/2015 11:19:00 PM

Gasoline by NWTPH-Gx

Batch ID: 10616

Analyst: BC

Gasoline	ND	4.53		mg/Kg-dry	1	4/24/2015 5:26:00 PM
Surr: Toluene-d8	91.5	65-135		%REC	1	4/24/2015 2:51:00 AM
Surr: 4-Bromofluorobenzene	93.6	65-135		%REC	1	4/24/2015 2:51:00 AM

Sample Moisture (Percent Moisture)

Batch ID: R21985

Analyst: CG

Percent Moisture	8.59			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------



Analytical Report

WO#: 1504152
Date Reported: 4/30/2015

Client: GeoEngineers

Collection Date: 4/15/2015 10:35:00 AM

Project: Block 20 Rufus 2.0

Lab ID: 1504152-033

Matrix: Soil

Client Sample ID: B-20-27-17.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 10615 Analyst: EC

Diesel (Fuel Oil)	ND	18.7		mg/Kg-dry	1	4/24/2015 5:02:00 AM
Heavy Oil	ND	46.6		mg/Kg-dry	1	4/24/2015 5:02:00 AM
Surr: 2-Fluorobiphenyl	89.5	50-150		%REC	1	4/24/2015 5:02:00 AM
Surr: o-Terphenyl	91.4	50-150		%REC	1	4/24/2015 5:02:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 10614 Analyst: NG

Naphthalene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
2-Methylnaphthalene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
1-Methylnaphthalene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Acenaphthylene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Acenaphthene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Fluorene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Phenanthrene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Anthracene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Fluoranthene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Pyrene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Benz(a)anthracene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Chrysene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Benzo(b)fluoranthene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Benzo(k)fluoranthene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Benzo(a)pyrene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Indeno(1,2,3-cd)pyrene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Dibenz(a,h)anthracene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Benzo(g,h,i)perylene	ND	54.6		µg/Kg-dry	1	4/27/2015 11:44:00 PM
Surr: 2-Fluorobiphenyl	85.0	42.7-132		%REC	1	4/27/2015 11:44:00 PM
Surr: Terphenyl-d14 (surr)	110	48.8-157		%REC	1	4/27/2015 11:44:00 PM

Gasoline by NWTPH-Gx

Batch ID: 10616 Analyst: BC

Gasoline	ND	4.22		mg/Kg-dry	1	4/24/2015 5:56:00 PM
Surr: Toluene-d8	92.8	65-135		%REC	1	4/24/2015 3:20:00 AM
Surr: 4-Bromofluorobenzene	94.1	65-135		%REC	1	4/24/2015 3:20:00 AM

Sample Moisture (Percent Moisture)

Batch ID: R21985 Analyst: CG

Percent Moisture	8.66			wt%	1	4/24/2015 9:36:25 AM
------------------	------	--	--	-----	---	----------------------

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	MB-10621	SampType:	MBLK	Units:	mg/Kg	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	MBLKS	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417496		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	ND	0.100									
Cadmium	ND	0.200									
Chromium	ND	0.100									
Lead	ND	0.200									

Sample ID	LCS-10621	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	LCSS	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417497		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	173	0.100	161.0	0	107	70.8	129.8				
Cadmium	199	0.200	190.0	0	105	73.2	126.3				
Chromium	108	0.100	87.90	0	123	69.1	130.8				
Lead	147	0.200	138.0	0	107	73.2	127.5				

Sample ID	1504151-004ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	BATCH	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417499		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	5.46	0.110						7.840	35.8	20	R
Cadmium	ND	0.221						0		20	
Chromium	66.0	0.110						81.67	21.3	20	R
Lead	5.62	0.221						6.647	16.7	20	

NOTES:

R - High RPD observed. The method is in control as indicated by the laboratory control sample (LCS).

Sample ID	1504151-004AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	4/24/2015	RunNo:	21995		
Client ID:	BATCH	Batch ID:	10621			Analysis Date:	4/24/2015	SeqNo:	417501		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	61.9	0.110	55.20	7.840	97.9	75	125				
Cadmium	2.86	0.221	2.760	0.02622	103	75	125				



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1504151-004AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 4/24/2015	RunNo: 21995					
Client ID: BATCH	Batch ID: 10621				Analysis Date: 4/24/2015	SeqNo: 417501					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chromium	154	0.110	55.20	81.67	132	75	125				S
Lead	37.5	0.221	27.60	6.647	112	75	125				

NOTES:

S - Outlying spike recovery observed. MSD recovered within specification.

Sample ID 1504151-004AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 4/24/2015	RunNo: 21995					
Client ID: BATCH	Batch ID: 10621				Analysis Date: 4/24/2015	SeqNo: 417504					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	59.5	0.110	55.20	7.840	93.6	75	125	61.90	3.91	20	
Cadmium	2.69	0.221	2.760	0.02622	96.4	75	125	2.865	6.44	20	
Chromium	137	0.110	55.20	81.67	99.7	75	125	154.5	12.2	20	
Lead	34.8	0.221	27.60	6.647	102	75	125	37.50	7.41	20	



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-10632	SampType: MBLK	Units: mg/Kg				Prep Date: 4/27/2015	RunNo: 22016				
Client ID: MBLKS	Batch ID: 10632					Analysis Date: 4/27/2015	SeqNo: 417926				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID LCS-10632	SampType: LCS	Units: mg/Kg				Prep Date: 4/27/2015	RunNo: 22016				
Client ID: LCSS	Batch ID: 10632					Analysis Date: 4/27/2015	SeqNo: 417927				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 5.85 0.250 5.000 0 117 80 120

Sample ID 1504228-001ADUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 4/27/2015	RunNo: 22016				
Client ID: BATCH	Batch ID: 10632					Analysis Date: 4/27/2015	SeqNo: 417929				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.301 0 20

Sample ID 1504228-001AMS	SampType: MS	Units: mg/Kg-dry				Prep Date: 4/27/2015	RunNo: 22016				
Client ID: BATCH	Batch ID: 10632					Analysis Date: 4/27/2015	SeqNo: 417930				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.725 0.306 0.6127 0.03836 112 70 130

Sample ID 1504228-001AMSD	SampType: MSD	Units: mg/Kg-dry				Prep Date: 4/27/2015	RunNo: 22016				
Client ID: BATCH	Batch ID: 10632					Analysis Date: 4/27/2015	SeqNo: 417950				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.733 0.306 0.6127 0.03836 113 70 130 0.7254 1.01 20



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Mercury (SW7470) with TCLP Extraction (EPA 1311)

Sample ID MB-10623	SampType: MBLK	Units: mg/L	Prep Date: 4/24/2015	RunNo: 21997							
Client ID: MBLKS	Batch ID: 10623		Analysis Date: 4/24/2015	SeqNo: 417592							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.00200

Sample ID LCS-10623	SampType: LCS	Units: mg/L	Prep Date: 4/24/2015	RunNo: 21997							
Client ID: LCSS	Batch ID: 10623		Analysis Date: 4/24/2015	SeqNo: 417593							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.00278 0.00200 0.002500 0 111 70 130

Sample ID 1504152-013ADUP	SampType: DUP	Units: mg/L	Prep Date: 4/24/2015	RunNo: 21997							
Client ID: B-20-21-10.5	Batch ID: 10623		Analysis Date: 4/24/2015	SeqNo: 417597							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.00200 0 20

Sample ID 1504152-013AMS	SampType: MS	Units: mg/L	Prep Date: 4/24/2015	RunNo: 21997							
Client ID: B-20-21-10.5	Batch ID: 10623		Analysis Date: 4/24/2015	SeqNo: 417598							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.00234 0.00200 0.002500 0 93.6 70 130

Sample ID 1504152-013AMSD	SampType: MSD	Units: mg/L	Prep Date: 4/24/2015	RunNo: 21997							
Client ID: B-20-21-10.5	Batch ID: 10623		Analysis Date: 4/24/2015	SeqNo: 417599							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.00259 0.00200 0.002500 0 104 70 130 0.002340 10.1 30

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Metals (SW6020) with TCLP Extraction (EPA 1311)

Sample ID MB-10620	SampType: MBLK	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: MBLKS	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417628					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead ND 0.500

Sample ID LCS-10620	SampType: LCS	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: LCSS	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417631					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 2.46 0.500 2.500 0 98.4 65 135

Sample ID 1504151-009ADUP	SampType: DUP	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: BATCH	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417633					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead ND 0.500 0 30

Sample ID 1504151-009AMS	SampType: MS	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: BATCH	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417634					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 2.48 0.500 2.500 0.08627 95.7 65 135

Sample ID 1504151-009AMSD	SampType: MSD	Units: mg/L			Prep Date: 4/24/2015	RunNo: 21998					
Client ID: BATCH	Batch ID: 10620				Analysis Date: 4/24/2015	SeqNo: 417640					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 2.45 0.500 2.500 0.08627 94.7 65 135 2.478 0.954 30



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1504151-032ADUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 4/23/2015	RunNo: 21984				
Client ID: BATCH	Batch ID: 10615					Analysis Date: 4/23/2015	SeqNo: 417289				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	21.8						0		30	
Heavy Oil	ND	54.6						0		30	
Surr: 2-Fluorobiphenyl	20.0		21.82		91.7	50	150		0		
Surr: o-Terphenyl	20.4		21.82		93.6	50	150		0		

Sample ID LCS-10615	SampType: LCS	Units: mg/Kg				Prep Date: 4/23/2015	RunNo: 21984				
Client ID: LCSS	Batch ID: 10615					Analysis Date: 4/23/2015	SeqNo: 417306				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	486	20.0	500.0	0	97.2	65	135				
Surr: 2-Fluorobiphenyl	19.5		20.00		97.5	50	150				
Surr: o-Terphenyl	23.5		20.00		118	50	150				

Sample ID MB-10615	SampType: MBLK	Units: mg/Kg				Prep Date: 4/23/2015	RunNo: 21984				
Client ID: MBLKS	Batch ID: 10615					Analysis Date: 4/23/2015	SeqNo: 417307				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	19.3		20.00		96.6	50	150				
Surr: o-Terphenyl	19.2		20.00		96.0	50	150				



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	1504192-001ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	4/23/2015	RunNo:	22048		
Client ID:	BATCH	Batch ID:	10614			Analysis Date:	4/27/2015	SeqNo:	418547		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	55.1						0		30	
2-Methylnaphthalene	ND	55.1						0		30	
1-Methylnaphthalene	ND	55.1						0		30	
Acenaphthylene	ND	55.1						0		30	
Acenaphthene	ND	55.1						0		30	
Fluorene	ND	55.1						0		30	
Phenanthrene	ND	55.1						0		30	
Anthracene	ND	55.1						0		30	
Fluoranthene	ND	55.1						0		30	
Pyrene	ND	55.1						0		30	
Benz(a)anthracene	ND	55.1						0		30	
Chrysene	ND	55.1						0		30	
Benzo(b)fluoranthene	ND	55.1						0		30	
Benzo(k)fluoranthene	ND	55.1						0		30	
Benzo(a)pyrene	ND	55.1						0		30	
Indeno(1,2,3-cd)pyrene	ND	55.1						0		30	
Dibenz(a,h)anthracene	ND	55.1						0		30	
Benzo(g,h,i)perylene	ND	55.1						0		30	
Surr: 2-Fluorobiphenyl	484		550.9		87.9	42.7	132		0		
Surr: Terphenyl-d14 (surr)	545		550.9		99.0	48.8	157		0		

Sample ID	1504192-002AMS	SampType:	MS	Units:	µg/Kg-dry	Prep Date:	4/23/2015	RunNo:	22048		
Client ID:	BATCH	Batch ID:	10614			Analysis Date:	4/27/2015	SeqNo:	418549		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,070	56.9	1,139	0	93.9	42.9	138				
2-Methylnaphthalene	982	56.9	1,139	0	86.3	42.8	151				
1-Methylnaphthalene	862	56.9	1,139	0	75.7	41.6	148				
Acenaphthylene	1,010	56.9	1,139	0	88.8	32.6	160				
Acenaphthene	1,200	56.9	1,139	0	106	46.3	142				
Fluorene	1,210	56.9	1,139	0	106	43.4	153				

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1504192-002AMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 4/23/2015	RunNo: 22048							
Client ID: BATCH	Batch ID: 10614		Analysis Date: 4/27/2015	SeqNo: 418549							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenanthrene	1,130	56.9	1,139	0	99.5	45.5	140				
Anthracene	1,090	56.9	1,139	0	96.0	32.6	160				
Fluoranthene	1,030	56.9	1,139	0	90.6	44.6	161				
Pyrene	1,010	56.9	1,139	0	88.7	48.3	158				
Benz(a)anthracene	1,080	56.9	1,139	0	95.2	57.5	169				
Chrysene	1,180	56.9	1,139	0	104	45.2	146				
Benzo(b)fluoranthene	1,540	56.9	1,139	0	135	42.2	168				
Benzo(k)fluoranthene	1,290	56.9	1,139	0	113	48	161				
Benzo(a)pyrene	1,190	56.9	1,139	0	105	34.4	179				
Indeno(1,2,3-cd)pyrene	1,320	56.9	1,139	0	116	41.1	165				
Dibenz(a,h)anthracene	1,420	56.9	1,139	0	125	38.1	166				
Benzo(g,h,i)perylene	1,280	56.9	1,139	0	112	45.6	157				
Surr: 2-Fluorobiphenyl	241		569.4		42.3	42.7	132				S
Surr: Terphenyl-d14 (surr)	506		569.4		88.9	48.8	157				

NOTES:

S - Outlying surrogate recovery observed. The method is in control as indicated by the LCS.

Sample ID LCS-10614	SampType: LCS	Units: µg/Kg	Prep Date: 4/23/2015	RunNo: 22048							
Client ID: LCSS	Batch ID: 10614		Analysis Date: 4/27/2015	SeqNo: 418559							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	962	50.0	1,000	0	96.2	61.6	125				
2-Methylnaphthalene	879	50.0	1,000	0	87.9	58.2	129				
1-Methylnaphthalene	933	50.0	1,000	0	93.3	56.4	132				
Acenaphthylene	883	50.0	1,000	0	88.3	52.2	133				
Acenaphthene	1,020	50.0	1,000	0	102	54	131				
Fluorene	1,000	50.0	1,000	0	100	53.4	131				
Phenanthrene	950	50.0	1,000	0	95.0	55.6	128				
Anthracene	914	50.0	1,000	0	91.4	51	132				
Fluoranthene	874	50.0	1,000	0	87.4	48.4	134				
Pyrene	864	50.0	1,000	0	86.4	48.6	135				
Benz(a)anthracene	906	50.0	1,000	0	90.6	41.9	136				

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID LCS-10614	SampType: LCS	Units: µg/Kg				Prep Date: 4/23/2015	RunNo: 22048				
Client ID: LCSS	Batch ID: 10614					Analysis Date: 4/27/2015	SeqNo: 418559				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chrysene	1,010	50.0	1,000	0	101	51.4	135				
Benzo(b)fluoranthene	1,320	50.0	1,000	0	132	39.7	137				
Benzo(k)fluoranthene	1,090	50.0	1,000	0	109	45.7	138				
Benzo(a)pyrene	1,050	50.0	1,000	0	105	40.9	141				
Indeno(1,2,3-cd)pyrene	1,160	50.0	1,000	0	116	41	140				
Dibenz(a,h)anthracene	1,240	50.0	1,000	0	124	37.6	140				
Benzo(g,h,i)perylene	1,140	50.0	1,000	0	114	45	134				
Surr: 2-Fluorobiphenyl	446		500.0		89.1	42.7	132				
Surr: Terphenyl-d14 (surr)	444		500.0		88.8	48.8	157				

Sample ID MB-10614	SampType: MBLK	Units: µg/Kg				Prep Date: 4/23/2015	RunNo: 22048				
Client ID: MBLKS	Batch ID: 10614					Analysis Date: 4/27/2015	SeqNo: 418560				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	50.0									
2-Methylnaphthalene	ND	50.0									
1-Methylnaphthalene	ND	50.0									
Acenaphthylene	ND	50.0									
Acenaphthene	ND	50.0									
Fluorene	ND	50.0									
Phenanthrene	ND	50.0									
Anthracene	ND	50.0									
Fluoranthene	ND	50.0									
Pyrene	ND	50.0									
Benz(a)anthracene	ND	50.0									
Chrysene	ND	50.0									
Benzo(b)fluoranthene	ND	50.0									
Benzo(k)fluoranthene	ND	50.0									
Benzo(a)pyrene	ND	50.0									
Indeno(1,2,3-cd)pyrene	ND	50.0									
Dibenz(a,h)anthracene	ND	50.0									

Work Order: 1504152
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID MB-10614	SampType: MBLK	Units: µg/Kg			Prep Date: 4/23/2015	RunNo: 22048					
Client ID: MBLKS	Batch ID: 10614				Analysis Date: 4/27/2015	SeqNo: 418560					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzo(g,h,i)perylene	ND	50.0									
Surr: 2-Fluorobiphenyl	439		500.0		87.7	42.7	132				
Surr: Terphenyl-d14 (surr)	474		500.0		94.8	48.8	157				

Sample ID CCV-E-10614	SampType: CCV	Units: µg/L			Prep Date: 4/28/2015	RunNo: 22048					
Client ID: CCV	Batch ID: 10614				Analysis Date: 4/28/2015	SeqNo: 418766					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	1,010	50.0	1,000	0	101	80	120				
2-Methylnaphthalene	1,050	50.0	1,000	0	105	80	120				
1-Methylnaphthalene	1,010	50.0	1,000	0	101	80	120				
Phenanthrene	948	50.0	1,000	0	94.8	80	120				
Fluoranthene	974	50.0	1,000	0	97.4	80	120				
Pyrene	976	50.0	1,000	0	97.6	80	120				
Benz(a)anthracene	1,000	50.0	1,000	0	100	80	120				
Chrysene	1,200	50.0	1,000	0	120	80	120				
Benzo(b)fluoranthene	1,190	50.0	1,000	0	119	80	120				
Surr: 2-Fluorobiphenyl	540		500.0		108	50.4	142				
Surr: Terphenyl-d14 (surr)	478		500.0		95.6	48.8	157				

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID 1504152-013BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21988							
Client ID: B-20-21-10.5	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417375							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	3.49						0		30	
Gasoline Range Organics (C6-C12)	62.6	3.49						60.71	3.03	30	
Surr: Toluene-d8	0.803		0.8734		91.9	65	135		0		
Surr: 4-Bromofluorobenzene	0.839		0.8734		96.1	65	135		0		

NOTES:

GRO - Indicates the presence of unresolved compounds eluting from toluene to dodecane (~C7->C12).

Sample ID LCS-10616	SampType: LCS	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21988							
Client ID: LCSS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417384							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	23.7	5.00	25.00	0	94.9	65	135				
Surr: Toluene-d8	1.18		1.250		94.7	65	135				
Surr: 4-Bromofluorobenzene	1.18		1.250		94.1	65	135				

Sample ID MB-10616	SampType: MBLK	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21988							
Client ID: MBLKS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417385							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.15		1.250		92.1	65	135				
Surr: 4-Bromofluorobenzene	1.16		1.250		92.9	65	135				



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	1504152-013BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	B-20-21-10.5	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417358		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0419						0		30	
Chloromethane	ND	0.0419						0		30	
Vinyl chloride	ND	0.00140						0		30	
Bromomethane	ND	0.0629						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0349						0		30	
Chloroethane	ND	0.0419						0		30	
1,1-Dichloroethene	ND	0.0349						0		30	
Methylene chloride	ND	0.0140						0		30	
trans-1,2-Dichloroethene	ND	0.0140						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0349						0		30	
1,1-Dichloroethane	ND	0.0140						0		30	
2,2-Dichloropropane	ND	0.0349						0		30	
cis-1,2-Dichloroethene	ND	0.0140						0		30	
Chloroform	ND	0.0140						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0140						0		30	
1,1-Dichloropropene	ND	0.0140						0		30	
Carbon tetrachloride	ND	0.0140						0		30	
1,2-Dichloroethane (EDC)	ND	0.0210						0		30	
Benzene	ND	0.0140						0		30	
Trichloroethene (TCE)	ND	0.0140						0		30	
1,2-Dichloropropane	ND	0.0140						0		30	
Bromodichloromethane	ND	0.0140						0		30	
Dibromomethane	ND	0.0279						0		30	
cis-1,3-Dichloropropene	ND	0.0140						0		30	
Toluene	ND	0.0140						0		30	
trans-1,3-Dichloropropylene	ND	0.0210						0		30	
1,1,2-Trichloroethane	ND	0.0210						0		30	
1,3-Dichloropropane	ND	0.0349						0		30	
Tetrachloroethene (PCE)	ND	0.0140						0		30	
Dibromochloromethane	ND	0.0210						0		30	
1,2-Dibromoethane (EDB)	ND	0.00349						0		30	



Date: 4/30/2015

Work Order: 1504152
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	1504152-013BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	B-20-21-10.5	Batch ID:	10616	Analysis Date:	4/23/2015	SeqNo:	417358				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	ND	0.0140						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0210						0		30	
Ethylbenzene	ND	0.0210						0		30	
m,p-Xylene	0.0352	0.0140						0.03586	1.77	30	
o-Xylene	ND	0.0140						0		30	
Styrene	ND	0.0140						0		30	
Isopropylbenzene	ND	0.0559						0		30	
Bromoform	ND	0.0140						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0140						0		30	
n-Propylbenzene	0.165	0.0140						0.1659	0.433	30	
Bromobenzene	ND	0.0210						0		30	
1,3,5-Trimethylbenzene	0.0199	0.0140						0.02100	5.29	30	
2-Chlorotoluene	ND	0.0140						0		30	
4-Chlorotoluene	ND	0.0140						0		30	
tert-Butylbenzene	ND	0.0140						0		30	
1,2,3-Trichloropropane	ND	0.0140						0		30	
1,2,4-Trichlorobenzene	0.0587	0.0349						0.06478	9.86	30	
sec-Butylbenzene	0.0599	0.0140						0.06051	0.934	30	
4-Isopropyltoluene	0.0651	0.0140						0.06578	1.05	30	
1,3-Dichlorobenzene	ND	0.0140						0		30	
1,4-Dichlorobenzene	ND	0.0140						0		30	
n-Butylbenzene	0.253	0.0140						0.2554	0.928	30	
1,2-Dichlorobenzene	0.0462	0.0140						0.04425	4.28	30	
1,2-Dibromo-3-chloropropane	ND	0.349						0		30	
1,2,4-Trimethylbenzene	0.107	0.0140						0.1092	1.87	30	
Hexachlorobutadiene	ND	0.0699						0		30	
Naphthalene	0.0753	0.0210						0.09049	18.3	30	
1,2,3-Trichlorobenzene	ND	0.0140						0		30	
Surr: Dibromofluoromethane	0.903		0.8734		103	63.7	129		0		
Surr: Toluene-d8	0.918		0.8734		105	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.883		0.8734		101	63.1	141		0		



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504152-013BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: B-20-21-10.5	Batch ID: 10616	Analysis Date: 4/23/2015	SeqNo: 417358								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID 1504152-014BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: B-20-21-13.0	Batch ID: 10616	Analysis Date: 4/24/2015	SeqNo: 417360								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.521	0.0368	0.6132	0	84.9	43.5	121				
Chloromethane	0.563	0.0368	0.6132	0.004719	91.1	45	130				
Vinyl chloride	0.695	0.00123	0.6132	0	113	51.2	146				
Bromomethane	1.36	0.0552	0.6132	0	222	21.3	120				S
Trichlorofluoromethane (CFC-11)	1.19	0.0307	0.6132	0	195	35	131				S
Chloroethane	0.790	0.0368	0.6132	0	129	43.8	117				S
Ethyl Ethane	0.761	0.0307	0.6132	0	124	70	130				
Vinyl acetate	0.527	0.0123	0.6132	0	85.9	70	130				
1,1-Dichloroethene	0.752	0.0307	0.6132	0	123	61.9	141				
Acetone	1.53	0.153	1.533	0	99.5	44.8	134				
3-Chloropropene	0.825	0.0307	0.6132	0	135	70	130				S
Iodomethane	0.818	0.0123	0.6132	0	133	26	106				S
Methylene chloride	0.631	0.0123	0.6132	0	103	54.7	142				
Carbon disulfide	1.00	0.0123	0.6132	0	163	40.6	152				S
Acrylonitrile	0.822	0.0123	0.6132	0	134	51	124				S
trans-1,2-Dichloroethene	0.743	0.0123	0.6132	0	121	52	136				
Methyl tert-butyl ether (MTBE)	0.644	0.0307	0.6132	0	105	54.4	132				
1,1-Dichloroethane	0.754	0.0123	0.6132	0	123	51.8	141				
2,2-Dichloropropane	0.799	0.0307	0.6132	0	130	36	123				S
cis-1,2-Dichloroethene	0.775	0.0123	0.6132	0	126	58.6	136				
(MEK) 2-Butanone	1.37	0.153	1.533	0	89.6	31.4	135				
Methyl acrylate	0.643	0.0123	0.6132	0	105	70	130				
Tetrahydrofuran	0.582	0.0123	0.6132	0	94.8	45.7	123				
Chloroform	0.659	0.0123	0.6132	0	107	53.2	129				
Bromochloromethane	0.748	0.0123	0.6132	0	122	52.2	137				
Propionitrile	ND	0.200	0.6132	0	0	70	130				S



Work Order: 1504152
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	1504152-014BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	4/23/2015	RunNo:	21987
Client ID:	B-20-21-13.0	Batch ID:	10616			Analysis Date:	4/24/2015	SeqNo:	417360

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1-Trichloroethane (TCA)	0.749	0.0123	0.6132	0	122	58.3	145				
Methacrylonitrile	0.531	0.0307	0.6132	0	86.6	70	130				
1,1-Dichloropropene	0.631	0.0123	0.6132	0	103	55.1	138				
Carbon tetrachloride	0.728	0.0123	0.6132	0	119	53.3	144				
1,2-Dichloroethane (EDC)	0.544	0.0184	0.6132	0	88.7	51.3	139				
Benzene	0.602	0.0123	0.6132	0.008858	96.8	63.5	133				
Butyl Chloride	ND	0.0307	0.6132	0	0	70	130				S
Trichloroethene (TCE)	0.710	0.0123	0.6132	0	116	68.6	132				
1,2-Dichloropropane	0.660	0.0123	0.6132	0	108	59	136				
Methyl methacrylate	ND	0.0123	0.6132	0	0	70	130				S
Bromodichloromethane	0.742	0.0123	0.6132	0	121	50.7	141				
Dibromomethane	0.772	0.0245	0.6132	0	126	50.6	137				
cis-1,3-Dichloropropene	0.690	0.0123	0.6132	0	112	50.4	138				
2-Nitropropane	1.14	0.0307	0.6132	0	186	43.4	157				S
Chloroacetonitrile	ND	0.0307	0.6132	0	0	70	130				S
Toluene	0.679	0.0123	0.6132	0.002542	110	63.4	132				
trans-1,3-Dichloropropylene	0.699	0.0184	0.6132	0	114	44.1	147				
Ethyl methacrylate	0.663	0.0123	0.6132	0	108	70	130				
Methyl Isobutyl Ketone (MIBK)	1.82	0.153	1.533	0	119	47.7	142				
1,1,2-Trichloroethane	0.652	0.0184	0.6132	0	106	51.6	137				
1,3-Dichloropropane	0.622	0.0307	0.6132	0	101	53.1	134				
Tetrachloroethene (PCE)	0.715	0.0123	0.6132	0	117	35.6	158				
Dibromochloromethane	0.733	0.0184	0.6132	0	120	55.3	140				
1,2-Dibromoethane (EDB)	0.760	0.00307	0.6132	0	124	50.4	136				
methyl n-butyl ketone	1.51	0.153	1.533	0	98.4	24.9	130				
Chlorobenzene	0.581	0.0123	0.6132	0	94.8	60	133				
1,1,1,2-Tetrachloroethane	0.619	0.0184	0.6132	0	101	53.1	142				
Ethylbenzene	0.604	0.0184	0.6132	0	98.6	54.5	134				
m,p-Xylene	1.19	0.0123	1.226	0.001962	96.6	53.1	132				
o-Xylene	0.593	0.0123	0.6132	0	96.8	53.3	139				
Styrene	0.628	0.0123	0.6132	0	102	51.1	132				



Work Order: 1504152
 CLIENT: GeoEngineers
 Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	1504152-014BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	4/23/2015	RunNo:	21987
Client ID:	B-20-21-13.0	Batch ID:	10616			Analysis Date:	4/24/2015	SeqNo:	417360

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Isopropylbenzene	0.625	0.0491	0.6132	0.02286	98.2	58.9	138				
Bromoform	0.805	0.0123	0.6132	0	131	57.9	130				S
1,1,2,2-Tetrachloroethane	0.678	0.0123	0.6132	0	111	51.9	131				
n-Propylbenzene	0.692	0.0123	0.6132	0.08050	99.7	53.6	140				
Bromobenzene	0.627	0.0184	0.6132	0	102	54.2	140				
trans-1,4-Dichloro-2-butene	0.518	0.0123	0.6132	0	84.5	70	130				
1,3,5-Trimethylbenzene	0.611	0.0123	0.6132	0	99.6	51.8	136				
2-Chlorotoluene	0.624	0.0123	0.6132	0	102	51.6	136				
4-Chlorotoluene	0.611	0.0123	0.6132	0	99.7	50.1	139				
tert-Butylbenzene	0.613	0.0123	0.6132	0	99.9	50.5	135				
1,2,3-Trichloropropane	0.568	0.0123	0.6132	0	92.6	50.5	131				
Pentachloroethane	ND	0.0123	0.6132	0	0	70	130				S
1,2,4-Trichlorobenzene	0.540	0.0307	0.6132	0	88.0	50.8	130				
sec-Butylbenzene	0.652	0.0123	0.6132	0.02361	102	52.6	141				
1,4-Dioxane	ND	0.0123	0.6132	0	0	70	130				S
Chloroprene	ND	0.0123	0.6132	0	0	70	130				S
4-Isopropyltoluene	0.625	0.0123	0.6132	0.008858	100	52.9	134				
Ethyl acetate	0.597	0.0307	0.6132	0	97.3	40.1	139				
Nitrobenzene	ND	0.0123	0.6132	0	0	70	130				S
Hexane	0.745	0.0123	0.6132	0.009403	120	43.3	118				S
1,3-Dichlorobenzene	0.556	0.0123	0.6132	0	90.7	52.6	131				
1,4-Dichlorobenzene	0.556	0.0123	0.6132	0	90.7	52.9	129				
n-Butylbenzene	0.654	0.0123	0.6132	0.08020	93.5	52.6	130				
1,2-Dichlorobenzene	0.559	0.0123	0.6132	0.01566	88.6	55.8	129				
1,2-Dibromo-3-chloropropane	0.635	0.307	0.6132	0	104	40.5	131				
Hexachloroethane	ND	0.0123	0.6132	0	0	70	130				S
1,2,4-Trimethylbenzene	0.600	0.0123	0.6132	0	97.8	50.6	137				
Hexachloro-1,3-butadiene	0.624	0.0613	0.6132	0	102	40.6	158				
Naphthalene	0.525	0.0184	0.6132	0	85.6	52.3	124				
1,2,3-Trichlorobenzene	0.522	0.0123	0.6132	0	85.2	54.4	124				
Surr: Dibromofluoromethane	0.814		0.7665		106	63.7	129				



Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID 1504152-014BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: B-20-21-13.0	Batch ID: 10616		Analysis Date: 4/24/2015	SeqNo: 417360							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Toluene-d8	0.855		0.7665		111	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	0.807		0.7665		105	63.1	141				

NOTES:

S - Outlying QC recoveries were observed. The method is in control as indicated by the LCS.

Sample ID LCS-10616	SampType: LCS	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: LCSS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417368							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.762	0.0600	1.000	0	76.2	37.2	139				
Chloromethane	0.813	0.0600	1.000	0	81.3	38.8	132				
Vinyl chloride	0.940	0.00200	1.000	0	94.0	56.1	130				
Bromomethane	1.86	0.0900	1.000	0	186	41.3	148				S
Trichlorofluoromethane (CFC-11)	1.22	0.0500	1.000	0	122	42.9	147				
Chloroethane	1.03	0.0600	1.000	0	103	37.1	144				
1,1-Dichloroethene	0.877	0.0500	1.000	0	87.7	49.7	142				
Methylene chloride	0.975	0.0200	1.000	0	97.5	46.3	140				
trans-1,2-Dichloroethene	1.10	0.0200	1.000	0	110	68	130				
Methyl tert-butyl ether (MTBE)	1.01	0.0500	1.000	0	101	59.1	138				
1,1-Dichloroethane	1.01	0.0200	1.000	0	101	65.5	132				
2,2-Dichloropropane	1.22	0.0500	1.000	0	122	28.1	149				
cis-1,2-Dichloroethene	1.07	0.0200	1.000	0	107	71.3	135				
Chloroform	0.984	0.0200	1.000	0	98.4	67.5	129				
1,1,1-Trichloroethane (TCA)	1.09	0.0200	1.000	0	109	69	132				
1,1-Dichloropropene	0.959	0.0200	1.000	0	95.9	72.7	131				
Carbon tetrachloride	1.02	0.0200	1.000	0	102	63.4	137				
1,2-Dichloroethane (EDC)	0.912	0.0300	1.000	0	91.2	61.9	136				
Benzene	0.946	0.0200	1.000	0	94.6	64.3	133				
Trichloroethene (TCE)	0.942	0.0200	1.000	0	94.2	65.5	137				
1,2-Dichloropropane	0.808	0.0200	1.000	0	80.8	63.2	142				
Bromodichloromethane	0.997	0.0200	1.000	0	99.7	73.2	131				
Dibromomethane	1.04	0.0400	1.000	0	104	70	130				

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	LCS-10616	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	LCSS	Batch ID:	10616	Analysis Date:	4/23/2015	SeqNo:	417368				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
cis-1,3-Dichloropropene	0.977	0.0200	1.000	0	97.7	59.1	143				
Toluene	0.920	0.0200	1.000	0	92.0	67.3	138				
trans-1,3-Dichloropropylene	0.989	0.0300	1.000	0	98.9	49.2	149				
1,1,2-Trichloroethane	0.897	0.0300	1.000	0	89.7	74.5	129				
1,3-Dichloropropane	0.874	0.0500	1.000	0	87.4	70	130				
Tetrachloroethene (PCE)	0.916	0.0200	1.000	0	91.6	52.7	150				
Dibromochloromethane	0.990	0.0300	1.000	0	99.0	70.6	144				
1,2-Dibromoethane (EDB)	1.04	0.00500	1.000	0	104	70	130				
Chlorobenzene	0.936	0.0200	1.000	0	93.6	76.1	123				
1,1,1,2-Tetrachloroethane	0.971	0.0300	1.000	0	97.1	74.8	131				
Ethylbenzene	0.955	0.0300	1.000	0	95.5	74	129				
m,p-Xylene	1.91	0.0200	2.000	0	95.4	79.8	128				
o-Xylene	0.952	0.0200	1.000	0	95.2	72.7	124				
Styrene	1.01	0.0200	1.000	0	101	76.8	130				
Isopropylbenzene	0.948	0.0800	1.000	0	94.8	70	130				
Bromoform	1.21	0.0200	1.000	0	121	67	154				
1,1,1,2,2-Tetrachloroethane	1.12	0.0200	1.000	0	112	60	130				
n-Propylbenzene	0.971	0.0200	1.000	0	97.1	74.8	125				
Bromobenzene	1.00	0.0300	1.000	0	100	49.2	144				
1,3,5-Trimethylbenzene	0.968	0.0200	1.000	0	96.8	74.6	123				
2-Chlorotoluene	0.986	0.0200	1.000	0	98.6	76.7	129				
4-Chlorotoluene	0.972	0.0200	1.000	0	97.2	77.5	125				
tert-Butylbenzene	0.954	0.0200	1.000	0	95.4	66.2	130				
1,2,3-Trichloropropane	0.910	0.0200	1.000	0	91.0	67.9	136				
1,2,4-Trichlorobenzene	0.840	0.0500	1.000	0	84.0	65.6	137				
sec-Butylbenzene	0.981	0.0200	1.000	0	98.1	75.6	133				
4-Isopropyltoluene	0.949	0.0200	1.000	0	94.9	76.8	131				
1,3-Dichlorobenzene	0.896	0.0200	1.000	0	89.6	72.8	128				
1,4-Dichlorobenzene	0.896	0.0200	1.000	0	89.6	72.6	126				
n-Butylbenzene	0.905	0.0200	1.000	0	90.5	65.3	136				
1,2-Dichlorobenzene	0.895	0.0200	1.000	0	89.5	72.8	126				

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID	LCS-10616	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	LCSS	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417368		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dibromo-3-chloropropane	0.924	0.500	1.000	0	92.4	61.2	139				
1,2,4-Trimethylbenzene	0.950	0.0200	1.000	0	95.0	77.5	129				
Hexachlorobutadiene	0.998	0.100	1.000	0	99.8	42	151				
Naphthalene	0.806	0.0300	1.000	0	80.6	62.3	134				
1,2,3-Trichlorobenzene	0.806	0.0200	1.000	0	80.6	62.1	140				
Surr: Dibromofluoromethane	1.28		1.250		102	63.7	129				
Surr: Toluene-d8	1.19		1.250		95.5	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.31		1.250		105	63.1	141				

NOTES:

S - Outlying QC recoveries were observed (Bromomethane; high bias). Samples are non-detect for this analyte, no further action required.

Sample ID	MB-10616	SampType:	MBLK	Units:	mg/Kg	Prep Date:	4/23/2015	RunNo:	21987		
Client ID:	MBLKS	Batch ID:	10616			Analysis Date:	4/23/2015	SeqNo:	417369		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	ND	0.0600									
Chloromethane	ND	0.0600									
Vinyl chloride	ND	0.00200									
Bromomethane	ND	0.0900									
Trichlorofluoromethane (CFC-11)	ND	0.0500									
Chloroethane	ND	0.0600									
1,1-Dichloroethene	ND	0.0500									
Methylene chloride	ND	0.0200									
trans-1,2-Dichloroethene	ND	0.0200									
Methyl tert-butyl ether (MTBE)	ND	0.0500									
1,1-Dichloroethane	ND	0.0200									
2,2-Dichloropropane	ND	0.0500									
cis-1,2-Dichloroethene	ND	0.0200									
Chloroform	ND	0.0200									
1,1,1-Trichloroethane (TCA)	ND	0.0200									
1,1-Dichloropropene	ND	0.0200									
Carbon tetrachloride	ND	0.0200									



Date: 4/30/2015

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID MB-10616	SampType: MBLK	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: MBLKS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417369							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dichloroethane (EDC)	ND	0.0300									
Benzene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									
1,2-Dichloropropane	ND	0.0200									
Bromodichloromethane	ND	0.0200									
Dibromomethane	ND	0.0400									
cis-1,3-Dichloropropene	ND	0.0200									
Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									
1,1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									
tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									

Work Order: 1504152
CLIENT: GeoEngineers
Project: Block 20 Rufus 2.0

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260

Sample ID MB-10616	SampType: MBLK	Units: mg/Kg	Prep Date: 4/23/2015	RunNo: 21987							
Client ID: MBLKS	Batch ID: 10616		Analysis Date: 4/23/2015	SeqNo: 417369							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									
1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									
1,2-Dichlorobenzene	ND	0.0200									
1,2-Dibromo-3-chloropropane	ND	0.500									
1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.13		1.250		90.1	63.7	129				
Surr: Toluene-d8	1.18		1.250		94.7	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.26		1.250		101	63.1	141				

Client Name: **GEI**
 Logged by: **Clare Griggs**

Work Order Number: **1504152**
 Date Received: **4/15/2015 4:40:00 PM**

Chain of Custody

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

Log In

3. Coolers are present? Yes No NA
 4. Shipping container/cooler in good condition? Yes No
 5. Custody seals intact on shipping container/cooler? Yes No Not Required
 6. Was an attempt made to cool the samples? Yes No NA
 7. Were all coolers received at a temperature of >0°C to 10.0°C Yes No NA
Please refer to item information.
 8. Sample(s) in proper container(s)? Yes No
 9. Sufficient sample volume for indicated test(s)? Yes No
 10. Are samples properly preserved? Yes No
 11. Was preservative added to bottles? Yes No NA
 12. Is the headspace in the VOA vials? Yes No NA
 13. Did all samples containers arrive in good condition(unbroken)? Yes No
 14. Does paperwork match bottle labels? Yes No
 15. Are matrices correctly identified on Chain of Custody? Yes No
 16. Is it clear what analyses were requested? Yes No
 17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C	Condition
Cooler	12.9	
Sample	12.9	
Temp Blank	11.8	



Chain of Custody Record

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

Laboratory Project No (Internal): 1504152
Page: 1 of 2

Client: GEOSCIENCE INC.
Address: _____
City, State, Zip _____

Project Name: BLOCK 20 BUEYS 2.0
Location: SEATTLE WA 98101
Collected by: NATHAN SOLOMON

Reports To (PM): JESSICA SMITH

Email: nsolomon@geosciencereports.com Project No: 20151-001-24

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

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 200)	GV/TEX	Gasoline Range Organics (GRO)	Methoxybenzene Identification (MCI)	Distillates/Heavy Oil Range Organics (DOR)	STAN VOC (EPA 8270 - SW)	PCB (EPA 8270 - SW)	Mercury** (EPA 8270 - SW)	Lead** (EPA 8270 - SW)	Antimony (EPA 8270 - SW)	Asbestos (EPA 8270 - SW)	Comments/Depth
1 B-20-27-20.0	4.15.15	1045	SOIL												X
2 B-20-27-23.5		1040													X
3 B-20-22-0.6		1115													X
4 B-20-22-3.0		1120													X
5 B-20-22-7.5		1130													X
6 B-20-22-5.0		1125													X
7 B-20-22-10.0		1135													X
8 B-20-22-12.5		1140													X
9 B-20-22-14.0		1145													X
10 B-20-21-3.0		1240													X

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

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

Sample Disposal: Return to Client Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Relinquished: [Signature] Date/Time: 4.15.15 / 11:40

Received: [Signature] Date/Time: 4.15.15 / 10:40

Special Remarks: **PLEASE CONTACT JESS FOR ANALYTICS**

TAT -> SameDay* NextDay* 2 Day 3 Day STD
*Please coordinate with the lab in advance



3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record

Laboratory Project No (Internal): _____
 Page: 2 of: 4/24
 Project Name: BLOCK 20 RUFFS 2.0
 Location: SEATTLE WA 98101
 Collected by: NATHAN SALOMON
 Email: nsolomon@geoenvironmental.com No: 20431-001-24

Date: 4/15/2015

Client: GEOENGINEERS INC.

Address: _____

City, State, Zip _____

Reports To (PM): JESSICA SMITH Tel: _____ Fax: _____

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

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GV/BCX	GC/MS (EPA 8210)	Hydrocarbon Identification (HICD)	PM/Heavy Oil range Organic (PM)	PM/PAH (EPA 8270)	Metals** (EPA 8220)	Total (T) Dissolved (D)	Anions (IC)** (EPA 8011)	Comments/Depth
1 B-20-21-5.5	4/15/15	1245	SOIL										
2 B-20-21-8.0		1250											
3 B-20-21-10.5		1255											
4 B-20-21-13.0		1300											
5 B-20-25-2.0		1345											
6 B-20-25-4.5		1350											
7 B-20-25-7.0		1355											
8 B-20-25-10.0		1400											
9 B-20-25-12.5		1405											
10 B-20-25-15.0		1410											

**Metals Analysis (Circle): (MTCV-5) Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Ni Pb Sb Se Sr Sn Tl U V Zn

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

Special Remarks: Added 04-23-15

Sample Disposal: Return to Client Disposal by Lab (a fee may be assessed if samples are received after 30 days.)

Relinquished: [Signature] Date/Time: 4/15/15 1640

Relinquished: [Signature] Date/Time: 4/15/15 1640

TAT -> SameDay* NextDay* 2 Day 3 Day STD

*Please coordinate with the lab in advance



Fremont
Analytical

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

Client: **GEOENGINEERS INC.**

Address:

City, State, Zip

Tel:

Reports To (PM): **JESSICA SMITH** Fax:

Chain of Custody Record

Laboratory Project No (Internal):

Page: **3** of: **4**

Project Name:

Block 20 RUES 20

Location:

SEATTLE WA 98101

Collected by:

NATHAN SALMON

Reports To (PM): **JESSICA SMITH** Fax:

Subject No: **20131-001-24**

**Matrix Codes: A = Air, AC = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (PA 6270)	SVOC (PA 6270)	Hydrocarbon Identification (HID)	Gasoline Range Organics (GRO)	BTEX	PCB (PA 8270)	PAH (PA 8270)	Metal** (200/200g)	Total (1) Dissolved (D)	Asbestos*** (801)	Comments/Depth
1 B-20-25-17.5	4.15.15	1415	SOIL											X
2 B-20-25-19.0	4.15.15	1420	SOIL											X
3 TRIPBLANK-OHIS15	4.15.15	N/A	LIQUID											X
4 TEMPBLANK-OHIS15	4.15.15	N/A	LIQUID											X
5 B-20-23-3.0	4.15.15	850	SOIL	X	X	X	X	X	X	X				X
6 B-20-23-5.5	4.15.15	910	SOIL											X
7 B-20-23-8.0	4.15.15	920	SOIL											X
8 B-20-23-10.5	4.15.15	940	SOIL											X
9 B-20-23-13.0	4.15.15	1000	SOIL											X
10 B-20-27-5.0	4.15.15	1615	SOIL	X	X	X	X	X	X	X				X

***Metals Analysis (Circle): **MTCA-5**

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

Special Remarks:

Sample Disposal: Return to Client Disposal by Lab (A-As may be analyzed if samples are retained after 30 days.)

Relinquished: **JK** Date/Time: **4.15.15/1616**

Received: **JK** Date/Time: **4/15/15/1640**

TAT -> Same Day* Next Day** 2 Day 3 Day STD
*Please coordinate with the lab in advance



Fremont
Analytical

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

Client: GREENGLIMBERG INC.
Address: _____
City, State, Zip _____

Chain of Custody Record

Laboratory Project No (Internal): _____

Date: 4/15/15

Page: 4 of: 4

Project Name: Block 20 Rufus 2.0
Project No: 20434-001-24 Collected by: Nathan Solomon
Location: Seattle
Reports To (PM): Jessica Smith

Email: _____

Fax: _____

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

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	LOC (EPA 820)	GV/ATX	Gasoline Range Organics (GX)	Methoxybenz Identification (HCID)	SCAN VOL (EPA 8270)	PCAs (EPA 8270 - SM)	Metals ** (EPA 822)	Teal (T) (EPA 200.8)	Anions (A) ** (EPA 809.1)	LOD (EPA 809.1)	Comments/Death
1 B-20-27-7.5	4-15-15	10:20	Soil											X
2 B-20-27-10.0		10:25												X
3 B-20-27-15.0		10:30												X
4 B-20-27-17.5		10:35												X
5														
6														
7														
8														
9														
10														

**Metals Analysis (Circle): MTCA-5 RCPA-3 RCPA-3 Priority Pollutants TAL individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

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

Sample Disposal: Return to Client Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Relinquished Date/Time _____ Received Date/Time _____

Relinquished Date/Time _____ Received Date/Time _____

TAT -> SameDay* NextDay* 2 Day 3 Day STD

*Please coordinate with the lab in advance



GeoEngineers

Chris Brown
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Rufus - Block 20
Work Order Number: 1610007

October 07, 2016

Attention Chris Brown:

Fremont Analytical, Inc. received 2 sample(s) on 9/30/2016 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Gasoline by NWTPH-Gx
Mercury by EPA Method 7471
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Polychlorinated Biphenyls (PCB) by EPA 8082
Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)
Sample Moisture (Percent Moisture)
Total Metals by EPA Method 6020
Volatile Organic Compounds by EPA Method 8260C

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director



CLIENT: GeoEngineers
Project: Rufus - Block 20
Work Order: 1610007

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1610007-001	SC-1-5.0	09/30/2016 11:20 AM	09/30/2016 4:30 PM
1610007-002	SC-2-15.0	09/30/2016 11:25 AM	09/30/2016 4:30 PM

CLIENT: GeoEngineers
Project: Rufus - Block 20

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Client: GeoEngineers

Collection Date: 9/30/2016 11:20:00 AM

Project: Rufus - Block 20

Lab ID: 1610007-001

Matrix: Soil

Client Sample ID: SC-1-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15013

Analyst: WC

Diesel (Fuel Oil)	ND	22.6		mg/Kg-dry	1	10/4/2016 4:26:00 PM
Heavy Oil	ND	56.4		mg/Kg-dry	1	10/4/2016 4:26:00 PM
Surr: 2-Fluorobiphenyl	91.5	50-150		%Rec	1	10/4/2016 4:26:00 PM
Surr: o-Terphenyl	92.9	50-150		%Rec	1	10/4/2016 4:26:00 PM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15014

Analyst: BT

Naphthalene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
2-Methylnaphthalene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
1-Methylnaphthalene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Acenaphthylene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Acenaphthene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Fluorene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Phenanthrene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Anthracene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Fluoranthene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Pyrene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Benz(a)anthracene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Chrysene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Benzo(b)fluoranthene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Benzo(k)fluoranthene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Benzo(a)pyrene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Indeno(1,2,3-cd)pyrene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Dibenz(a,h)anthracene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Benzo(g,h,i)perylene	ND	41.7		µg/Kg-dry	1	10/5/2016 4:28:01 AM
Surr: 2-Fluorobiphenyl	64.6	32.2-123		%Rec	1	10/5/2016 4:28:01 AM
Surr: Terphenyl-d14 (surr)	82.8	42.2-152		%Rec	1	10/5/2016 4:28:01 AM

Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)

Batch ID: 15066

Analyst: BT

Aroclor 1016	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1221	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1232	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1242	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1248	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1254	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1260	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1262	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Aroclor 1268	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM



Client: GeoEngineers

Collection Date: 9/30/2016 11:20:00 AM

Project: Rufus - Block 20

Lab ID: 1610007-001

Matrix: Soil

Client Sample ID: SC-1-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)

Batch ID: 15066 Analyst: BT

Total PCBs	ND	0.111		mg/Kg-dry	1	10/7/2016 5:53:47 AM
Surr: Decachlorobiphenyl	58.2	40.7-166		%Rec	1	10/7/2016 5:53:47 AM
Surr: Tetrachloro-m-xylene	57.2	40-146		%Rec	1	10/7/2016 5:53:47 AM

Gasoline by NWTPH-Gx

Batch ID: 15016 Analyst: NG

Gasoline	ND	4.57		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Surr: Toluene-d8	98.6	65-135		%Rec	1	10/4/2016 10:08:20 PM
Surr: 4-Bromofluorobenzene	98.9	65-135		%Rec	1	10/4/2016 10:08:20 PM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15016 Analyst: NG

Dichlorodifluoromethane (CFC-12)	ND	0.0548	Q	mg/Kg-dry	1	10/4/2016 10:08:20 PM
Chloromethane	ND	0.0548		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Vinyl chloride	ND	0.00183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Bromomethane	ND	0.0822		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Trichlorofluoromethane (CFC-11)	ND	0.0457		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Chloroethane	ND	0.0548		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,1-Dichloroethene	ND	0.0457		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Methylene chloride	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
trans-1,2-Dichloroethene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Methyl tert-butyl ether (MTBE)	ND	0.0457		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,1-Dichloroethane	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
2,2-Dichloropropane	ND	0.0457	Q	mg/Kg-dry	1	10/4/2016 10:08:20 PM
cis-1,2-Dichloroethene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Chloroform	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,1,1-Trichloroethane (TCA)	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,1-Dichloropropene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Carbon tetrachloride	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2-Dichloroethane (EDC)	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Benzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Trichloroethene (TCE)	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2-Dichloropropane	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Bromodichloromethane	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Dibromomethane	ND	0.0365		mg/Kg-dry	1	10/4/2016 10:08:20 PM
cis-1,3-Dichloropropene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Toluene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
trans-1,3-Dichloropropylene	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,1,2-Trichloroethane	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM



Client: GeoEngineers

Collection Date: 9/30/2016 11:20:00 AM

Project: Rufus - Block 20

Lab ID: 1610007-001

Matrix: Soil

Client Sample ID: SC-1-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15016

Analyst: NG

1,3-Dichloropropane	ND	0.0457		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Tetrachloroethene (PCE)	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Dibromochloromethane	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2-Dibromoethane (EDB)	ND	0.00457		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Chlorobenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,1,1,2-Tetrachloroethane	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Ethylbenzene	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM
m,p-Xylene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
o-Xylene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Styrene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Isopropylbenzene	ND	0.0731		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Bromoform	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,1,2,2-Tetrachloroethane	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
n-Propylbenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Bromobenzene	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,3,5-Trimethylbenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
2-Chlorotoluene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
4-Chlorotoluene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
tert-Butylbenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2,3-Trichloropropane	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2,4-Trichlorobenzene	ND	0.0457		mg/Kg-dry	1	10/4/2016 10:08:20 PM
sec-Butylbenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
4-Isopropyltoluene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,3-Dichlorobenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,4-Dichlorobenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
n-Butylbenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2-Dichlorobenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2-Dibromo-3-chloropropane	ND	0.457		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2,4-Trimethylbenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Hexachlorobutadiene	ND	0.0913		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Naphthalene	ND	0.0274		mg/Kg-dry	1	10/4/2016 10:08:20 PM
1,2,3-Trichlorobenzene	ND	0.0183		mg/Kg-dry	1	10/4/2016 10:08:20 PM
Surr: Dibromofluoromethane	95.8	56.5-129		%Rec	1	10/4/2016 10:08:20 PM
Surr: Toluene-d8	103	64.3-131		%Rec	1	10/4/2016 10:08:20 PM
Surr: 1-Bromo-4-fluorobenzene	97.6	63.1-141		%Rec	1	10/4/2016 10:08:20 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).



Client: GeoEngineers

Collection Date: 9/30/2016 11:20:00 AM

Project: Rufus - Block 20

Lab ID: 1610007-001

Matrix: Soil

Client Sample ID: SC-1-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Mercury by EPA Method 7471

Batch ID: 14997 Analyst: MW

Mercury	ND	0.297		mg/Kg-dry	1	10/3/2016 5:15:13 PM
---------	----	-------	--	-----------	---	----------------------

Total Metals by EPA Method 6020

Batch ID: 14995 Analyst: TN

Arsenic	10.4	0.0950		mg/Kg-dry	1	10/3/2016 3:31:54 PM
Barium	131	0.475		mg/Kg-dry	1	10/3/2016 3:31:54 PM
Cadmium	ND	0.190		mg/Kg-dry	1	10/3/2016 3:31:54 PM
Chromium	57.2	0.0950		mg/Kg-dry	1	10/3/2016 3:31:54 PM
Lead	19.4	0.190		mg/Kg-dry	1	10/3/2016 3:31:54 PM
Selenium	1.81	0.475		mg/Kg-dry	1	10/3/2016 3:31:54 PM
Silver	ND	0.0950		mg/Kg-dry	1	10/3/2016 3:31:54 PM

Sample Moisture (Percent Moisture)

Batch ID: R32082 Analyst: WF

Percent Moisture	15.8			wt%	1	10/3/2016 2:25:33 PM
------------------	------	--	--	-----	---	----------------------



Client: GeoEngineers
Project: Rufus - Block 20
Lab ID: 1610007-002
Client Sample ID: SC-2-15.0

Collection Date: 9/30/2016 11:25:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15013 Analyst: WC

Diesel (Fuel Oil)	ND	26.4		mg/Kg-dry	1	10/4/2016 6:33:00 PM
Heavy Oil	525	66.0		mg/Kg-dry	1	10/4/2016 6:33:00 PM
Surr: 2-Fluorobiphenyl	92.3	50-150		%Rec	1	10/4/2016 6:33:00 PM
Surr: o-Terphenyl	92.5	50-150		%Rec	1	10/4/2016 6:33:00 PM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15014 Analyst: BT

Naphthalene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
2-Methylnaphthalene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
1-Methylnaphthalene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Acenaphthylene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Acenaphthene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Fluorene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Phenanthrene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Anthracene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Fluoranthene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Pyrene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Benz(a)anthracene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Chrysene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Benzo(b)fluoranthene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Benzo(k)fluoranthene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Benzo(a)pyrene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Indeno(1,2,3-cd)pyrene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Dibenz(a,h)anthracene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Benzo(g,h,i)perylene	ND	53.3		µg/Kg-dry	1	10/5/2016 4:49:04 AM
Surr: 2-Fluorobiphenyl	68.5	32.2-123		%Rec	1	10/5/2016 4:49:04 AM
Surr: Terphenyl-d14 (surr)	83.8	42.2-152		%Rec	1	10/5/2016 4:49:04 AM

Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)

Batch ID: 15066 Analyst: BT

Aroclor 1016	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1221	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1232	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1242	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1248	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1254	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1260	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1262	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Aroclor 1268	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM



Client: GeoEngineers
Project: Rufus - Block 20
Lab ID: 1610007-002
Client Sample ID: SC-2-15.0

Collection Date: 9/30/2016 11:25:00 AM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)

Batch ID: 15066 Analyst: BT

Total PCBs	ND	0.135		mg/Kg-dry	1	10/7/2016 8:31:40 AM
Surr: Decachlorobiphenyl	51.2	40.7-166		%Rec	1	10/7/2016 8:31:40 AM
Surr: Tetrachloro-m-xylene	43.3	40-146		%Rec	1	10/7/2016 8:31:40 AM

Gasoline by NWTPH-Gx

Batch ID: 15016 Analyst: NG

Gasoline	ND	5.82		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Surr: Toluene-d8	98.9	65-135		%Rec	1	10/4/2016 11:06:43 PM
Surr: 4-Bromofluorobenzene	100	65-135		%Rec	1	10/4/2016 11:06:43 PM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15016 Analyst: NG

Dichlorodifluoromethane (CFC-12)	ND	0.0698	Q	mg/Kg-dry	1	10/4/2016 11:06:43 PM
Chloromethane	ND	0.0698		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Vinyl chloride	ND	0.00233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Bromomethane	ND	0.105		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Trichlorofluoromethane (CFC-11)	ND	0.0582		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Chloroethane	ND	0.0698		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,1-Dichloroethene	ND	0.0582		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Methylene chloride	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
trans-1,2-Dichloroethene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Methyl tert-butyl ether (MTBE)	ND	0.0582		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,1-Dichloroethane	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
2,2-Dichloropropane	ND	0.0582	Q	mg/Kg-dry	1	10/4/2016 11:06:43 PM
cis-1,2-Dichloroethene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Chloroform	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,1,1-Trichloroethane (TCA)	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,1-Dichloropropene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Carbon tetrachloride	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2-Dichloroethane (EDC)	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Benzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Trichloroethene (TCE)	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2-Dichloropropane	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Bromodichloromethane	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Dibromomethane	ND	0.0466		mg/Kg-dry	1	10/4/2016 11:06:43 PM
cis-1,3-Dichloropropene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Toluene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
trans-1,3-Dichloropropylene	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,1,2-Trichloroethane	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM



Analytical Report

Work Order: 1610007
Date Reported: 10/7/2016

Client: GeoEngineers
Project: Rufus - Block 20
Lab ID: 1610007-002
Client Sample ID: SC-2-15.0

Collection Date: 9/30/2016 11:25:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15016 Analyst: NG

1,3-Dichloropropane	ND	0.0582		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Tetrachloroethene (PCE)	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Dibromochloromethane	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2-Dibromoethane (EDB)	ND	0.00582		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Chlorobenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,1,1,2-Tetrachloroethane	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Ethylbenzene	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM
m,p-Xylene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
o-Xylene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Styrene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Isopropylbenzene	ND	0.0931		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Bromoform	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,1,2,2-Tetrachloroethane	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
n-Propylbenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Bromobenzene	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,3,5-Trimethylbenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
2-Chlorotoluene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
4-Chlorotoluene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
tert-Butylbenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2,3-Trichloropropane	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2,4-Trichlorobenzene	ND	0.0582		mg/Kg-dry	1	10/4/2016 11:06:43 PM
sec-Butylbenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
4-Isopropyltoluene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,3-Dichlorobenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,4-Dichlorobenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
n-Butylbenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2-Dichlorobenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2-Dibromo-3-chloropropane	ND	0.582		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2,4-Trimethylbenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Hexachlorobutadiene	ND	0.116		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Naphthalene	ND	0.0349		mg/Kg-dry	1	10/4/2016 11:06:43 PM
1,2,3-Trichlorobenzene	ND	0.0233		mg/Kg-dry	1	10/4/2016 11:06:43 PM
Surr: Dibromofluoromethane	93.3	56.5-129		%Rec	1	10/4/2016 11:06:43 PM
Surr: Toluene-d8	103	64.3-131		%Rec	1	10/4/2016 11:06:43 PM
Surr: 1-Bromo-4-fluorobenzene	98.9	63.1-141		%Rec	1	10/4/2016 11:06:43 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).



Client: GeoEngineers

Collection Date: 9/30/2016 11:25:00 AM

Project: Rufus - Block 20

Lab ID: 1610007-002

Matrix: Soil

Client Sample ID: SC-2-15.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Mercury by EPA Method 7471

Batch ID: 14997 Analyst: MW

Mercury	ND	0.332		mg/Kg-dry	1	10/3/2016 5:20:07 PM
---------	----	-------	--	-----------	---	----------------------

Total Metals by EPA Method 6020

Batch ID: 14995 Analyst: TN

Arsenic	6.05	0.106		mg/Kg-dry	1	10/3/2016 3:35:27 PM
Barium	134	0.528		mg/Kg-dry	1	10/3/2016 3:35:27 PM
Cadmium	ND	0.211		mg/Kg-dry	1	10/3/2016 3:35:27 PM
Chromium	79.5	0.106		mg/Kg-dry	1	10/3/2016 3:35:27 PM
Lead	6.08	0.211		mg/Kg-dry	1	10/3/2016 3:35:27 PM
Selenium	2.10	0.528		mg/Kg-dry	1	10/3/2016 3:35:27 PM
Silver	ND	0.106		mg/Kg-dry	1	10/3/2016 3:35:27 PM

Sample Moisture (Percent Moisture)

Batch ID: R32082 Analyst: WF

Percent Moisture	26.1			wt%	1	10/3/2016 2:25:33 PM
------------------	------	--	--	-----	---	----------------------

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-15013	SampType: MBLK	Units: mg/Kg				Prep Date: 10/4/2016	RunNo: 32121				
Client ID: MBLKS	Batch ID: 15013					Analysis Date: 10/4/2016	SeqNo: 607429				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	18.9		20.00		94.7	50	150				
Surr: o-Terphenyl	18.7		20.00		93.6	50	150				

Sample ID LCS-15013	SampType: LCS	Units: mg/Kg				Prep Date: 10/4/2016	RunNo: 32121				
Client ID: LCSS	Batch ID: 15013					Analysis Date: 10/4/2016	SeqNo: 607428				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	501	20.0	500.0	0	100	65	135				
Surr: 2-Fluorobiphenyl	22.9		20.00		114	50	150				
Surr: o-Terphenyl	22.2		20.00		111	50	150				

Sample ID 1610007-001ADUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32121				
Client ID: SC-1-5.0	Batch ID: 15013					Analysis Date: 10/4/2016	SeqNo: 607403				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	21.9						0		30	
Heavy Oil	119	54.9						36.35	107	30	R
Surr: 2-Fluorobiphenyl	19.7		21.94		89.7	50	150		0		
Surr: o-Terphenyl	19.6		21.94		89.4	50	150		0		

NOTES:

R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).

Sample ID 1610007-001AMS	SampType: MS	Units: mg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32121				
Client ID: SC-1-5.0	Batch ID: 15013					Analysis Date: 10/4/2016	SeqNo: 607404				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	581	23.3	582.5	0	99.7	65	135				
Surr: 2-Fluorobiphenyl	24.2		23.30		104	50	150				

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1610007-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32121					
Client ID: SC-1-5.0	Batch ID: 15013				Analysis Date: 10/4/2016	SeqNo: 607404					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: o-Terphenyl 24.8 23.30 106 50 150

Sample ID 1610007-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32121					
Client ID: SC-1-5.0	Batch ID: 15013				Analysis Date: 10/4/2016	SeqNo: 607405					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil) 509 21.1 528.1 0 96.4 65 135 580.7 13.1 30
 Surr: 2-Fluorobiphenyl 21.7 21.12 103 50 150 0
 Surr: o-Terphenyl 22.0 21.12 104 50 150 0

Sample ID 1610041-006ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32121					
Client ID: BATCH	Batch ID: 15013				Analysis Date: 10/5/2016	SeqNo: 607418					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil) ND 18.5 0 30
 Heavy Oil ND 46.3 0 30
 Surr: 2-Fluorobiphenyl 18.6 18.50 100 50 150 0
 Surr: o-Terphenyl 18.4 18.50 99.4 50 150 0

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID LCS-15016	SampType: LCS	Units: mg/Kg				Prep Date: 10/4/2016	RunNo: 32131				
Client ID: LCSS	Batch ID: 15016					Analysis Date: 10/4/2016	SeqNo: 607498				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	26.0	5.00	25.00	0	104	65	135				
Surr: Toluene-d8	1.25		1.250		99.9	65	135				
Surr: 4-Bromofluorobenzene	1.26		1.250		101	65	135				

Sample ID MB-15016	SampType: MBLK	Units: mg/Kg				Prep Date: 10/4/2016	RunNo: 32131				
Client ID: MBLKS	Batch ID: 15016					Analysis Date: 10/4/2016	SeqNo: 607499				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.26		1.250		101	65	135				
Surr: 4-Bromofluorobenzene	1.23		1.250		98.6	65	135				

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32131				
Client ID: SC-1-5.0	Batch ID: 15016					Analysis Date: 10/4/2016	SeqNo: 607491				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	4.57						0		30	
Surr: Toluene-d8	1.12		1.141		97.9	65	135		0		
Surr: 4-Bromofluorobenzene	1.14		1.141		99.5	65	135		0		

Sample ID 1610007-002BMS	SampType: MS	Units: mg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32131				
Client ID: SC-2-15.0	Batch ID: 15016					Analysis Date: 10/5/2016	SeqNo: 607493				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	45.7	5.82	29.10	0	157	65	135				S
Surr: Toluene-d8	1.43		1.455		98.4	65	135				
Surr: 4-Bromofluorobenzene	1.55		1.455		106	65	135				

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID 1610007-002BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32131							
Client ID: SC-2-15.0	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607494							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	43.5	5.82	29.10	0	150	65	135	45.73	4.91	30	S
Surr: Toluene-d8	1.42		1.455		97.8	65	135		0		
Surr: 4-Bromofluorobenzene	1.56		1.455		107	65	135		0		

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-14997	SampType: MBLK	Units: mg/Kg	Prep Date: 10/3/2016	RunNo: 32089							
Client ID: MBLKS	Batch ID: 14997	Analysis Date: 10/3/2016	SeqNo: 606855								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.0245

Sample ID LCS-14997	SampType: LCS	Units: mg/Kg	Prep Date: 10/3/2016	RunNo: 32089							
Client ID: LCSS	Batch ID: 14997	Analysis Date: 10/3/2016	SeqNo: 606856								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.500 0.0240 0.4808 0 104 80 120

Sample ID 1609374-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32089							
Client ID: BATCH	Batch ID: 14997	Analysis Date: 10/3/2016	SeqNo: 606858								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.259 0 20

Sample ID 1609374-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32089							
Client ID: BATCH	Batch ID: 14997	Analysis Date: 10/3/2016	SeqNo: 606859								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.567 0.264 0.5282 0.01128 105 70 130

Sample ID 1609374-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32089							
Client ID: BATCH	Batch ID: 14997	Analysis Date: 10/3/2016	SeqNo: 606860								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.541 0.264 0.5282 0.01128 100 70 130 0.5673 4.77 20

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID MB-15014	SampType: MBLK	Units: µg/Kg	Prep Date: 10/4/2016	RunNo: 32139							
Client ID: MBLKS	Batch ID: 15014		Analysis Date: 10/5/2016	SeqNo: 607573							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	364		500.0		72.7	32.2	123				
Surr: Terphenyl-d14 (surr)	429		500.0		85.8	42.2	152				

Sample ID LCS-15014	SampType: LCS	Units: µg/Kg	Prep Date: 10/4/2016	RunNo: 32139							
Client ID: LCSS	Batch ID: 15014		Analysis Date: 10/5/2016	SeqNo: 607574							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	799	40.0	1,000	0	79.9	51.6	136				
2-Methylnaphthalene	821	40.0	1,000	0	82.1	45.1	135				
1-Methylnaphthalene	812	40.0	1,000	0	81.2	46.2	133				
Acenaphthylene	769	40.0	1,000	0	76.9	32.8	136				
Acenaphthene	772	40.0	1,000	0	77.2	38.7	129				

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID LCS-15014	SampType: LCS	Units: µg/Kg				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: LCSS	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607574				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	782	40.0	1,000	0	78.2	41.1	132				
Phenanthrene	729	40.0	1,000	0	72.9	43.9	133				
Anthracene	920	40.0	1,000	0	92.0	44.2	136				
Fluoranthene	775	40.0	1,000	0	77.5	45.9	137				
Pyrene	788	40.0	1,000	0	78.8	46.2	137				
Benz(a)anthracene	729	40.0	1,000	0	72.9	41.9	136				
Chrysene	745	40.0	1,000	0	74.5	46.9	138				
Benzo(b)fluoranthene	689	40.0	1,000	0	68.9	35.9	148				
Benzo(k)fluoranthene	772	40.0	1,000	0	77.2	43.9	144				
Benzo(a)pyrene	675	40.0	1,000	0	67.5	36.3	144				
Indeno(1,2,3-cd)pyrene	761	40.0	1,000	0	76.1	41	140				
Dibenz(a,h)anthracene	755	40.0	1,000	0	75.5	33.8	133				
Benzo(g,h,i)perylene	704	40.0	1,000	0	70.4	32.9	112				
Surr: 2-Fluorobiphenyl	324		500.0		64.8	32.2	123				
Surr: Terphenyl-d14 (surr)	389		500.0		77.8	42.2	152				

Sample ID 1609374-001ADUP	SampType: DUP	Units: µg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: BATCH	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607576				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	41.1						0		30	
2-Methylnaphthalene	ND	41.1						0		30	
1-Methylnaphthalene	ND	41.1						0		30	
Acenaphthylene	ND	41.1						0		30	
Acenaphthene	ND	41.1						0		30	
Fluorene	ND	41.1						0		30	
Phenanthrene	ND	41.1						0		30	
Anthracene	ND	41.1						0		30	
Fluoranthene	ND	41.1						0		30	
Pyrene	ND	41.1						0		30	

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1609374-001ADUP	SampType: DUP	Units: µg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: BATCH	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607576				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	ND	41.1						0		30	
Chrysene	ND	41.1						0		30	
Benzo(b)fluoranthene	ND	41.1						0		30	
Benzo(k)fluoranthene	ND	41.1						0		30	
Benzo(a)pyrene	ND	41.1						0		30	
Indeno(1,2,3-cd)pyrene	ND	41.1						0		30	
Dibenz(a,h)anthracene	ND	41.1						0		30	
Benzo(g,h,i)perylene	ND	41.1						0		30	
Surr: 2-Fluorobiphenyl	361		513.4		70.2	32.2	123		0		
Surr: Terphenyl-d14 (surr)	415		513.4		80.7	42.2	152		0		

Sample ID 1609374-001AMS	SampType: MS	Units: µg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: BATCH	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607577				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	721	36.3	907.6	0	79.5	42.9	138				
2-Methylnaphthalene	746	36.3	907.6	0	82.2	42.8	151				
1-Methylnaphthalene	749	36.3	907.6	0	82.5	41.6	148				
Acenaphthylene	703	36.3	907.6	0	77.4	32.6	160				
Acenaphthene	716	36.3	907.6	0	78.9	46.3	142				
Fluorene	728	36.3	907.6	0	80.2	43.4	153				
Phenanthrene	696	36.3	907.6	2.237	76.5	45.5	140				
Anthracene	860	36.3	907.6	0	94.7	32.6	160				
Fluoranthene	770	36.3	907.6	0	84.8	44.6	161				
Pyrene	775	36.3	907.6	2.828	85.1	48.3	158				
Benz(a)anthracene	728	36.3	907.6	5.790	79.6	57.5	169				
Chrysene	692	36.3	907.6	1.958	76.0	45.2	146				
Benzo(b)fluoranthene	786	36.3	907.6	11.90	85.2	42.2	168				
Benzo(k)fluoranthene	719	36.3	907.6	12.49	77.8	48	161				
Benzo(a)pyrene	720	36.3	907.6	13.05	77.9	34.4	179				

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1609374-001AMS	SampType: MS	Units: µg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32139					
Client ID: BATCH	Batch ID: 15014				Analysis Date: 10/5/2016	SeqNo: 607577					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	805	36.3	907.6	11.22	87.5	41.1	165				
Dibenz(a,h)anthracene	785	36.3	907.6	12.33	85.2	38.1	166				
Benzo(g,h,i)perylene	730	36.3	907.6	9.643	79.4	45.6	157				
Surr: 2-Fluorobiphenyl	330		453.8		72.6	32.2	123				
Surr: Terphenyl-d14 (surr)	380		453.8		83.6	42.2	152				

Sample ID 1609374-001AMSD	SampType: MSD	Units: µg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32139					
Client ID: BATCH	Batch ID: 15014				Analysis Date: 10/5/2016	SeqNo: 607578					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	861	41.8	1,045	0	82.4	42.9	138	721.5	17.7	30	
2-Methylnaphthalene	936	41.8	1,045	0	89.5	42.8	151	746.1	22.5	30	
1-Methylnaphthalene	869	41.8	1,045	0	83.1	41.6	148	748.7	14.9	30	
Acenaphthylene	864	41.8	1,045	0	82.7	32.6	160	702.8	20.6	30	
Acenaphthene	870	41.8	1,045	0	83.2	46.3	142	716.4	19.3	30	
Fluorene	883	41.8	1,045	0	84.5	43.4	153	727.9	19.3	30	
Phenanthrene	844	41.8	1,045	2.237	80.5	45.5	140	696.2	19.2	30	
Anthracene	874	41.8	1,045	0	83.6	32.6	160	859.8	1.64	30	
Fluoranthene	922	41.8	1,045	0	88.2	44.6	161	769.8	18.0	30	
Pyrene	919	41.8	1,045	2.828	87.6	48.3	158	774.9	17.0	30	
Benz(a)anthracene	888	41.8	1,045	5.790	84.5	57.5	169	728.2	19.8	30	
Chrysene	830	41.8	1,045	1.958	79.3	45.2	146	691.9	18.2	30	
Benzo(b)fluoranthene	852	41.8	1,045	11.90	80.4	42.2	168	785.6	8.06	30	
Benzo(k)fluoranthene	912	41.8	1,045	12.49	86.1	48	161	718.6	23.8	30	
Benzo(a)pyrene	862	41.8	1,045	13.05	81.2	34.4	179	719.8	17.9	30	
Indeno(1,2,3-cd)pyrene	967	41.8	1,045	11.22	91.5	41.1	165	805.3	18.2	30	
Dibenz(a,h)anthracene	945	41.8	1,045	12.33	89.3	38.1	166	785.3	18.5	30	
Benzo(g,h,i)perylene	806	41.8	1,045	9.643	76.2	45.6	157	730.0	9.95	30	
Surr: 2-Fluorobiphenyl	384		522.5		73.6	32.2	123		0		
Surr: Terphenyl-d14 (surr)	449		522.5		85.9	42.2	152		0		



Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	1609374-001AMSD	SampType:	MSD	Units:	µg/Kg-dry	Prep Date:	10/4/2016	RunNo:	32139				
Client ID:	BATCH	Batch ID:	15014			Analysis Date:	10/5/2016	SeqNo:	607578				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)

Sample ID MB-15066	SampType: MBLK	Units: mg/Kg	Prep Date: 10/5/2016	RunNo: 32195							
Client ID: MBLKS	Batch ID: 15066		Analysis Date: 10/7/2016	SeqNo: 609013							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.100									
Aroclor 1221	ND	0.100									
Aroclor 1232	ND	0.100									
Aroclor 1242	ND	0.100									
Aroclor 1248	ND	0.100									
Aroclor 1254	ND	0.100									
Aroclor 1260	ND	0.100									
Aroclor 1262	ND	0.100									
Aroclor 1268	ND	0.100									
Total PCBs	ND	0.100									
Surr: Decachlorobiphenyl	0.0483		0.05000		96.6	40.7	166				
Surr: Tetrachloro-m-xylene	0.0431		0.05000		86.2	40	146				

Sample ID LCS-15066	SampType: LCS	Units: mg/Kg	Prep Date: 10/5/2016	RunNo: 32195							
Client ID: LCSS	Batch ID: 15066		Analysis Date: 10/7/2016	SeqNo: 609015							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.855	0.100	1.000	0	85.5	65	135				
Aroclor 1260	0.842	0.100	1.000	0	84.2	65	135				
Surr: Decachlorobiphenyl	0.0492		0.05000		98.4	40.7	166				
Surr: Tetrachloro-m-xylene	0.0443		0.05000		88.7	40	146				

Sample ID LCS2-15066	SampType: LCS	Units: mg/Kg	Prep Date: 10/5/2016	RunNo: 32195							
Client ID: LCSS	Batch ID: 15066		Analysis Date: 10/7/2016	SeqNo: 609014							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1254	0.830	0.100	1.000	0	83.0	65	135				
Surr: Decachlorobiphenyl	0.0374		0.05000		74.8	40.7	166				
Surr: Tetrachloro-m-xylene	0.0350		0.05000		69.9	40	146				

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)

Sample ID	1610007-001ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	10/5/2016	RunNo:	32195		
Client ID:	SC-1-5.0	Batch ID:	15066			Analysis Date:	10/7/2016	SeqNo:	609003		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.118						0		30	
Aroclor 1221	ND	0.118						0		30	
Aroclor 1232	ND	0.118						0		30	
Aroclor 1242	ND	0.118						0		30	
Aroclor 1248	ND	0.118						0		30	
Aroclor 1254	ND	0.118						0		30	
Aroclor 1260	ND	0.118						0		30	
Aroclor 1262	ND	0.118						0		30	
Aroclor 1268	ND	0.118						0		30	
Total PCBs	ND	0.118						0		30	
Surr: Decachlorobiphenyl	0.0375		0.05900		63.5	40.7	166		0		
Surr: Tetrachloro-m-xylene	0.0312		0.05900		53.0	40	146		0		

Sample ID	1610007-001AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	10/5/2016	RunNo:	32195		
Client ID:	SC-1-5.0	Batch ID:	15066			Analysis Date:	10/7/2016	SeqNo:	609004		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.02	0.118	1.185	0	85.9	65	135				
Aroclor 1260	1.01	0.118	1.185	0	85.6	65	135				
Surr: Decachlorobiphenyl	0.0435		0.05924		73.4	40.7	166				
Surr: Tetrachloro-m-xylene	0.0397		0.05924		67.1	40	146				

Sample ID	1610007-001AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/5/2016	RunNo:	32195		
Client ID:	SC-1-5.0	Batch ID:	15066			Analysis Date:	10/7/2016	SeqNo:	609005		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.00	0.118	1.182	0	84.7	65	135	1.017	1.56	30	
Aroclor 1260	1.04	0.118	1.182	0	88.2	65	135	1.014	2.82	30	
Surr: Decachlorobiphenyl	0.0360		0.05912		60.8	40.7	166		0		
Surr: Tetrachloro-m-xylene	0.0334		0.05912		56.6	40	146		0		



Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8270 (GCMS)

Sample ID	1610007-001AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/5/2016	RunNo:	32195		
Client ID:	SC-1-5.0	Batch ID:	15066			Analysis Date:	10/7/2016	SeqNo:	609005		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual



Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID 1609369-001ADUP	SampType: DUP	Units: wt%	Prep Date: 10/3/2016	RunNo: 32082							
Client ID: BATCH	Batch ID: R32082	Analysis Date: 10/3/2016	SeqNo: 606660								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	3.96	0.500						4.059	2.47	20	

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-14995	SampType: MBLK	Units: mg/Kg	Prep Date: 10/3/2016	RunNo: 32085							
Client ID: MBLKS	Batch ID: 14995		Analysis Date: 10/3/2016	SeqNo: 606710							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.0763									
Barium	ND	0.382									
Cadmium	ND	0.153									
Chromium	ND	0.0763									
Lead	ND	0.153									
Selenium	ND	0.382									
Silver	ND	0.0763									

Sample ID LCS-14995	SampType: LCS	Units: mg/Kg	Prep Date: 10/3/2016	RunNo: 32085							
Client ID: LCSS	Batch ID: 14995		Analysis Date: 10/3/2016	SeqNo: 606711							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	41.1	0.0800	40.00	0	103	80	120				
Barium	39.5	0.400	40.00	0	98.8	80	120				
Cadmium	2.16	0.160	2.000	0	108	80	120				
Chromium	39.2	0.0800	40.00	0	98.1	80	120				
Lead	19.7	0.160	20.00	0	98.5	80	120				
Selenium	3.45	0.400	4.000	0	86.4	80	120				
Silver	1.80	0.0800	2.000	0	90.0	80	120				

Sample ID 1609374-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32085							
Client ID: BATCH	Batch ID: 14995		Analysis Date: 10/3/2016	SeqNo: 606713							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	3.20	0.0825						2.951	8.20	20	
Barium	35.7	0.413						34.51	3.37	20	
Cadmium	ND	0.165						0		20	
Chromium	21.2	0.0825						18.92	11.2	20	
Lead	8.20	0.165						7.985	2.62	20	
Selenium	0.922	0.413						0.8605	6.90	20	

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1609374-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32085							
Client ID: BATCH	Batch ID: 14995	Analysis Date: 10/3/2016	SeqNo: 606713								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Silver	ND	0.0825						0		20	
--------	----	--------	--	--	--	--	--	---	--	----	--

NOTES:

R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID 1609374-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32085							
Client ID: BATCH	Batch ID: 14995	Analysis Date: 10/3/2016	SeqNo: 606715								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	45.5	0.0825	41.27	2.951	103	75	125				
Barium	88.8	0.413	41.27	34.51	132	75	125				S
Cadmium	2.08	0.165	2.063	0.08211	97.0	75	125				
Chromium	69.8	0.0825	41.27	18.92	123	75	125				
Lead	27.1	0.165	20.63	7.985	92.6	75	125				
Selenium	4.80	0.413	4.127	0.8605	95.5	75	125				
Silver	1.13	0.0825	2.063	0.01969	54.0	75	125				S

NOTES:

S - Outlying spike recovery(ies) observed (Ba, Ag). A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1609374-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32085							
Client ID: BATCH	Batch ID: 14995	Analysis Date: 10/3/2016	SeqNo: 606716								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	48.7	0.0845	42.26	2.951	108	75	125	45.51	6.77	20	
Barium	105	0.423	42.26	34.51	167	75	125	88.83	16.9	20	S
Cadmium	2.22	0.169	2.113	0.08211	101	75	125	2.084	6.39	20	
Chromium	77.3	0.0845	42.26	18.92	138	75	125	69.78	10.2	20	S
Lead	30.4	0.169	21.13	7.985	106	75	125	27.10	11.4	20	
Selenium	5.26	0.423	4.226	0.8605	104	75	125	4.803	9.10	20	
Silver	1.24	0.0845	2.113	0.01969	57.8	75	125	1.135	8.94	20	S

NOTES:

S - Outlying spike recovery(ies) observed (Ba, Ag). A duplicate analysis was performed with similar results indicating a possible matrix effect.

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1609374-001APDS	SampType: PDS	Units: mg/Kg-dry	Prep Date: 10/3/2016	RunNo: 32085							
Client ID: BATCH	Batch ID: 14995		Analysis Date: 10/3/2016	SeqNo: 606717							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Barium	78.7	0.423	42.3	34.5	105	80	120				
Silver	1.28	0.0845	2.11	0.0197	59.9	80	120				S

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).



Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15016	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130		
Client ID:	LCSS	Batch ID:	15016	Analysis Date:	10/4/2016	SeqNo:	607479				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.430	0.0600	1.000	0	43.0	34.5	141				Q
Chloromethane	0.761	0.0600	1.000	0	76.1	38.8	132				
Vinyl chloride	0.754	0.00200	1.000	0	75.4	44	142				
Bromomethane	1.02	0.0900	1.000	0	102	40.9	157				
Trichlorofluoromethane (CFC-11)	0.844	0.0500	1.000	0	84.4	42.9	147				
Chloroethane	0.900	0.0600	1.000	0	90.0	37.1	144				
1,1-Dichloroethene	0.938	0.0500	1.000	0	93.8	49.7	142				
Methylene chloride	1.03	0.0200	1.000	0	103	46.3	140				
trans-1,2-Dichloroethene	1.01	0.0200	1.000	0	101	68	130				
Methyl tert-butyl ether (MTBE)	1.03	0.0500	1.000	0	103	59.1	138				
1,1-Dichloroethane	1.04	0.0200	1.000	0	104	61.9	137				
2,2-Dichloropropane	1.34	0.0500	1.000	0	134	28.1	149				Q
cis-1,2-Dichloroethene	1.06	0.0200	1.000	0	106	71.3	135				
Chloroform	1.04	0.0200	1.000	0	104	67.5	129				
1,1,1-Trichloroethane (TCA)	1.02	0.0200	1.000	0	102	69	132				
1,1-Dichloropropene	1.01	0.0200	1.000	0	101	72.7	131				
Carbon tetrachloride	1.07	0.0200	1.000	0	107	63.4	137				
1,2-Dichloroethane (EDC)	1.04	0.0300	1.000	0	104	61.9	136				
Benzene	1.07	0.0200	1.000	0	107	64.3	133				
Trichloroethene (TCE)	1.05	0.0200	1.000	0	105	65.5	137				
1,2-Dichloropropane	1.10	0.0200	1.000	0	110	63.2	142				
Bromodichloromethane	1.05	0.0200	1.000	0	105	73.2	131				
Dibromomethane	1.08	0.0400	1.000	0	108	70	130				
cis-1,3-Dichloropropene	1.11	0.0200	1.000	0	111	59.1	143				
Toluene	1.11	0.0200	1.000	0	111	67.3	138				
trans-1,3-Dichloropropylene	1.14	0.0300	1.000	0	114	49.2	149				
1,1,2-Trichloroethane	1.11	0.0300	1.000	0	111	74.5	129				
1,3-Dichloropropane	1.08	0.0500	1.000	0	108	70	130				
Tetrachloroethene (PCE)	1.07	0.0200	1.000	0	107	52.7	150				
Dibromochloromethane	1.08	0.0300	1.000	0	108	70.6	144				
1,2-Dibromoethane (EDB)	1.06	0.00500	1.000	0	106	70	130				

Work Order: 1610007
 CLIENT: GeoEngineers
 Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15016	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130		
Client ID:	LCSS	Batch ID:	15016	Analysis Date:	10/4/2016	SeqNo:	607479				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	1.09	0.0200	1.000	0	109	76.1	123				
1,1,1,2-Tetrachloroethane	1.08	0.0300	1.000	0	108	65.9	141				
Ethylbenzene	1.05	0.0300	1.000	0	105	74	129				
m,p-Xylene	2.12	0.0200	2.000	0	106	70	124				
o-Xylene	1.05	0.0200	1.000	0	105	72.7	124				
Styrene	1.06	0.0200	1.000	0	106	76.8	130				
Isopropylbenzene	1.05	0.0800	1.000	0	105	70	130				
Bromoform	1.10	0.0200	1.000	0	110	67	154				
1,1,2,2-Tetrachloroethane	1.07	0.0200	1.000	0	107	60	130				
n-Propylbenzene	1.06	0.0200	1.000	0	106	74.8	125				
Bromobenzene	1.10	0.0300	1.000	0	110	49.2	144				
1,3,5-Trimethylbenzene	1.06	0.0200	1.000	0	106	74.6	123				
2-Chlorotoluene	1.06	0.0200	1.000	0	106	76.7	129				
4-Chlorotoluene	1.05	0.0200	1.000	0	105	77.5	125				
tert-Butylbenzene	1.05	0.0200	1.000	0	105	66.2	130				
1,2,3-Trichloropropane	1.09	0.0200	1.000	0	109	67.9	136				
1,2,4-Trichlorobenzene	1.12	0.0500	1.000	0	112	62.6	143				
sec-Butylbenzene	1.05	0.0200	1.000	0	105	75.6	133				
4-Isopropyltoluene	1.06	0.0200	1.000	0	106	76.8	131				
1,3-Dichlorobenzene	1.09	0.0200	1.000	0	109	72.8	128				
1,4-Dichlorobenzene	1.06	0.0200	1.000	0	106	72.6	126				
n-Butylbenzene	1.10	0.0200	1.000	0	110	65.3	136				
1,2-Dichlorobenzene	1.10	0.0200	1.000	0	110	72.8	126				
1,2-Dibromo-3-chloropropane	1.14	0.500	1.000	0	114	61.2	139				
1,2,4-Trimethylbenzene	1.07	0.0200	1.000	0	107	77.5	129				
Hexachlorobutadiene	1.11	0.100	1.000	0	111	42	151				
Naphthalene	1.15	0.0300	1.000	0	115	62.3	134				
1,2,3-Trichlorobenzene	1.12	0.0200	1.000	0	112	54.8	143				
Surr: Dibromofluoromethane	1.28		1.250		103	56.5	129				
Surr: Toluene-d8	1.28		1.250		103	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.31		1.250		104	63.1	141				

Work Order: 1610007
 CLIENT: GeoEngineers
 Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15016	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130				
Client ID:	LCSS	Batch ID:	15016			Analysis Date:	10/4/2016	SeqNo:	607479				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	MB-15016	SampType:	MBLK	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130				
Client ID:	MBLKS	Batch ID:	15016			Analysis Date:	10/4/2016	SeqNo:	607480				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0600											Q
Chloromethane	ND	0.0600											
Vinyl chloride	ND	0.00200											
Bromomethane	ND	0.0900											
Trichlorofluoromethane (CFC-11)	ND	0.0500											
Chloroethane	ND	0.0600											
1,1-Dichloroethene	ND	0.0500											
Methylene chloride	ND	0.0200											
trans-1,2-Dichloroethene	ND	0.0200											
Methyl tert-butyl ether (MTBE)	ND	0.0500											
1,1-Dichloroethane	ND	0.0200											
2,2-Dichloropropane	ND	0.0500											Q
cis-1,2-Dichloroethene	ND	0.0200											
Chloroform	ND	0.0200											
1,1,1-Trichloroethane (TCA)	ND	0.0200											
1,1-Dichloropropene	ND	0.0200											
Carbon tetrachloride	ND	0.0200											
1,2-Dichloroethane (EDC)	ND	0.0300											
Benzene	ND	0.0200											
Trichloroethene (TCE)	ND	0.0200											
1,2-Dichloropropane	ND	0.0200											
Bromodichloromethane	ND	0.0200											
Dibromomethane	ND	0.0400											
cis-1,3-Dichloropropene	ND	0.0200											

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15016	SampType: MBLK	Units: mg/Kg	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: MBLKS	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607480							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									
1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									
tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									
sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									
1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									
1,2-Dichlorobenzene	ND	0.0200									
1,2-Dibromo-3-chloropropane	ND	0.500									

Work Order: 1610007
 CLIENT: GeoEngineers
 Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15016	SampType: MBLK	Units: mg/Kg	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: MBLKS	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607480							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.24		1.250		99.4	56.5	129				
Surr: Toluene-d8	1.25		1.250		100	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.22		1.250		97.2	63.1	141				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: SC-1-5.0	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607470							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0548						0		30	Q
Chloromethane	ND	0.0548						0		30	
Vinyl chloride	ND	0.00183						0		30	
Bromomethane	ND	0.0822						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0457						0		30	
Chloroethane	ND	0.0548						0		30	
1,1-Dichloroethene	ND	0.0457						0		30	
Methylene chloride	ND	0.0183						0		30	
trans-1,2-Dichloroethene	ND	0.0183						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0457						0		30	
1,1-Dichloroethane	ND	0.0183						0		30	
2,2-Dichloropropane	ND	0.0457						0		30	Q
cis-1,2-Dichloroethene	ND	0.0183						0		30	
Chloroform	ND	0.0183						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0183						0		30	
1,1-Dichloropropene	ND	0.0183						0		30	
Carbon tetrachloride	ND	0.0183						0		30	

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: SC-1-5.0	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607470							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2-Dichloroethane (EDC)	ND	0.0274						0		30	
Benzene	ND	0.0183						0		30	
Trichloroethene (TCE)	ND	0.0183						0		30	
1,2-Dichloropropane	ND	0.0183						0		30	
Bromodichloromethane	ND	0.0183						0		30	
Dibromomethane	ND	0.0365						0		30	
cis-1,3-Dichloropropene	ND	0.0183						0		30	
Toluene	ND	0.0183						0		30	
trans-1,3-Dichloropropylene	ND	0.0274						0		30	
1,1,2-Trichloroethane	ND	0.0274						0		30	
1,3-Dichloropropane	ND	0.0457						0		30	
Tetrachloroethene (PCE)	ND	0.0183						0		30	
Dibromochloromethane	ND	0.0274						0		30	
1,2-Dibromoethane (EDB)	ND	0.00457						0		30	
Chlorobenzene	ND	0.0183						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0274						0		30	
Ethylbenzene	ND	0.0274						0		30	
m,p-Xylene	ND	0.0183						0		30	
o-Xylene	ND	0.0183						0		30	
Styrene	ND	0.0183						0		30	
Isopropylbenzene	ND	0.0731						0		30	
Bromoform	ND	0.0183						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0183						0		30	
n-Propylbenzene	ND	0.0183						0		30	
Bromobenzene	ND	0.0274						0		30	
1,3,5-Trimethylbenzene	ND	0.0183						0		30	
2-Chlorotoluene	ND	0.0183						0		30	
4-Chlorotoluene	ND	0.0183						0		30	
tert-Butylbenzene	ND	0.0183						0		30	
1,2,3-Trichloropropane	ND	0.0183						0		30	
1,2,4-Trichlorobenzene	ND	0.0457						0		30	

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: SC-1-5.0	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607470							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

sec-Butylbenzene	ND	0.0183						0		30	
4-Isopropyltoluene	ND	0.0183						0		30	
1,3-Dichlorobenzene	ND	0.0183						0		30	
1,4-Dichlorobenzene	ND	0.0183						0		30	
n-Butylbenzene	ND	0.0183						0		30	
1,2-Dichlorobenzene	ND	0.0183						0		30	
1,2-Dibromo-3-chloropropane	ND	0.457						0		30	
1,2,4-Trimethylbenzene	ND	0.0183						0		30	
Hexachlorobutadiene	ND	0.0913						0		30	
Naphthalene	ND	0.0274						0		30	
1,2,3-Trichlorobenzene	ND	0.0183						0		30	
Surr: Dibromofluoromethane	1.09		1.141		95.2	56.5	129		0		
Surr: Toluene-d8	1.18		1.141		103	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.12		1.141		98.1	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610034-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607475							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.661	0.0670	1.117	0	59.2	43.5	121				Q
Chloromethane	1.17	0.0670	1.117	0	105	45	130				
Vinyl chloride	1.03	0.00223	1.117	0	92.5	51.2	146				
Bromomethane	0.962	0.101	1.117	0	86.1	21.3	120				
Trichlorofluoromethane (CFC-11)	0.648	0.0558	1.117	0	58.0	35	131				
Chloroethane	0.782	0.0670	1.117	0	70.0	43.8	117				
1,1-Dichloroethene	1.15	0.0558	1.117	0	103	61.9	141				
Methylene chloride	1.24	0.0223	1.117	0	111	54.7	142				
trans-1,2-Dichloroethene	1.20	0.0223	1.117	0	107	52	136				
Methyl tert-butyl ether (MTBE)	1.20	0.0558	1.117	0	108	54.4	132				

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610034-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607475							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethane	1.18	0.0223	1.117	0	105	51.8	141				
2,2-Dichloropropane	1.25	0.0558	1.117	0	112	36	123				Q
cis-1,2-Dichloroethene	1.25	0.0223	1.117	0	112	58.6	136				
Chloroform	1.16	0.0223	1.117	0	104	53.2	129				
1,1,1-Trichloroethane (TCA)	1.14	0.0223	1.117	0	102	58.3	145				
1,1-Dichloropropene	1.21	0.0223	1.117	0	109	55.1	138				
Carbon tetrachloride	1.24	0.0223	1.117	0	111	53.3	144				
1,2-Dichloroethane (EDC)	1.17	0.0335	1.117	0	104	51.3	139				
Benzene	1.25	0.0223	1.117	0	112	63.5	133				
Trichloroethene (TCE)	1.19	0.0223	1.117	0	107	68.6	132				
1,2-Dichloropropane	1.24	0.0223	1.117	0	111	59	136				
Bromodichloromethane	1.06	0.0223	1.117	0	94.8	50.7	141				
Dibromomethane	1.17	0.0447	1.117	0	105	50.6	137				
cis-1,3-Dichloropropene	1.14	0.0223	1.117	0	103	50.4	138				
Toluene	1.29	0.0223	1.117	0	115	63.4	132				
trans-1,3-Dichloropropylene	1.17	0.0335	1.117	0	104	44.1	147				
1,1,2-Trichloroethane	1.19	0.0335	1.117	0	106	51.6	137				
1,3-Dichloropropane	1.21	0.0558	1.117	0	108	53.1	134				
Tetrachloroethene (PCE)	1.24	0.0223	1.117	0	111	35.6	158				
Dibromochloromethane	1.06	0.0335	1.117	0	94.6	55.3	140				
1,2-Dibromoethane (EDB)	1.17	0.00558	1.117	0	105	50.4	136				
Chlorobenzene	1.23	0.0223	1.117	0	110	60	133				
1,1,1,2-Tetrachloroethane	1.12	0.0335	1.117	0	100	53.1	142				
Ethylbenzene	1.22	0.0335	1.117	0.01340	108	54.5	134				
m,p-Xylene	2.45	0.0223	2.234	0.02681	108	53.1	132				
o-Xylene	1.24	0.0223	1.117	0	111	53.3	139				
Styrene	1.24	0.0223	1.117	0	111	51.1	132				
Isopropylbenzene	1.28	0.0894	1.117	0.02178	112	58.9	138				
Bromoform	0.975	0.0223	1.117	0	87.3	57.9	130				
1,1,1,2,2-Tetrachloroethane	1.14	0.0223	1.117	0	102	51.9	131				
n-Propylbenzene	1.31	0.0223	1.117	0.04021	114	53.6	140				

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610034-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607475							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromobenzene	1.25	0.0335	1.117	0	112	54.2	140				
1,3,5-Trimethylbenzene	1.31	0.0223	1.117	0.03239	114	51.8	136				
2-Chlorotoluene	1.23	0.0223	1.117	0	110	51.6	136				
4-Chlorotoluene	1.24	0.0223	1.117	0	111	50.1	139				
tert-Butylbenzene	1.29	0.0223	1.117	0	115	50.5	135				
1,2,3-Trichloropropane	1.14	0.0223	1.117	0	102	50.5	131				
1,2,4-Trichlorobenzene	1.32	0.0558	1.117	0	118	50.8	130				
sec-Butylbenzene	1.35	0.0223	1.117	0.04691	117	52.6	141				
4-Isopropyltoluene	1.39	0.0223	1.117	0.04412	120	52.9	134				
1,3-Dichlorobenzene	1.25	0.0223	1.117	0	112	52.6	131				
1,4-Dichlorobenzene	1.21	0.0223	1.117	0	108	52.9	129				
n-Butylbenzene	1.49	0.0223	1.117	0.08489	126	52.6	130				
1,2-Dichlorobenzene	1.24	0.0223	1.117	0	111	55.8	129				
1,2-Dibromo-3-chloropropane	0.981	0.558	1.117	0	87.8	40.5	131				
1,2,4-Trimethylbenzene	1.44	0.0223	1.117	0.1312	117	50.6	137				
Hexachlorobutadiene	1.48	0.112	1.117	0	133	40.6	158				
Naphthalene	1.45	0.0335	1.117	0.1273	118	52.3	124				
1,2,3-Trichlorobenzene	1.29	0.0223	1.117	0	116	54.4	124				
Surr: Dibromofluoromethane	1.39		1.396		99.3	56.5	129				
Surr: Toluene-d8	1.44		1.396		103	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.46		1.396		105	63.1	141				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610034-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607476							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.606	0.0670	1.117	0	54.2	43.5	121	0.6607	8.64	30	Q
Chloromethane	1.13	0.0670	1.117	0	101	45	130	1.173	3.73	30	
Vinyl chloride	0.979	0.00223	1.117	0	87.7	51.2	146	1.033	5.38	30	

Work Order: 1610007
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610034-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607476

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromomethane	0.910	0.101	1.117	0	81.4	21.3	120	0.9617	5.55	30	
Trichlorofluoromethane (CFC-11)	0.547	0.0558	1.117	0	49.0	35	131	0.6478	16.8	30	
Chloroethane	0.717	0.0670	1.117	0	64.2	43.8	117	0.7824	8.72	30	
1,1-Dichloroethene	1.07	0.0558	1.117	0	96.0	61.9	141	1.145	6.65	30	
Methylene chloride	1.16	0.0223	1.117	0	104	54.7	142	1.239	6.47	30	
trans-1,2-Dichloroethene	1.13	0.0223	1.117	0	102	52	136	1.197	5.37	30	
Methyl tert-butyl ether (MTBE)	1.23	0.0558	1.117	0	110	54.4	132	1.205	1.88	30	
1,1-Dichloroethane	1.13	0.0223	1.117	0	101	51.8	141	1.175	3.78	30	
2,2-Dichloropropane	1.22	0.0558	1.117	0	109	36	123	1.246	2.13	30	Q
cis-1,2-Dichloroethene	1.20	0.0223	1.117	0	107	58.6	136	1.248	4.25	30	
Chloroform	1.11	0.0223	1.117	0	99.5	53.2	129	1.164	4.66	30	
1,1,1-Trichloroethane (TCA)	1.08	0.0223	1.117	0	96.7	58.3	145	1.138	5.19	30	
1,1-Dichloropropene	1.19	0.0223	1.117	0	106	55.1	138	1.214	2.05	30	
Carbon tetrachloride	1.10	0.0223	1.117	0	98.5	53.3	144	1.240	12.0	30	
1,2-Dichloroethane (EDC)	1.13	0.0335	1.117	0	101	51.3	139	1.166	3.51	30	
Benzene	1.18	0.0223	1.117	0	106	63.5	133	1.246	5.06	30	
Trichloroethene (TCE)	1.15	0.0223	1.117	0	103	68.6	132	1.193	3.82	30	
1,2-Dichloropropane	1.20	0.0223	1.117	0	108	59	136	1.239	3.07	30	
Bromodichloromethane	1.02	0.0223	1.117	0	91.2	50.7	141	1.059	3.92	30	
Dibromomethane	1.14	0.0447	1.117	0	102	50.6	137	1.168	2.76	30	
cis-1,3-Dichloropropene	1.14	0.0223	1.117	0	102	50.4	138	1.145	0.587	30	
Toluene	1.25	0.0223	1.117	0	112	63.4	132	1.288	3.39	30	
trans-1,3-Dichloropropylene	1.17	0.0335	1.117	0	105	44.1	147	1.166	0.573	30	
1,1,2-Trichloroethane	1.16	0.0335	1.117	0	104	51.6	137	1.188	2.43	30	
1,3-Dichloropropane	1.19	0.0558	1.117	0	107	53.1	134	1.205	1.07	30	
Tetrachloroethene (PCE)	1.18	0.0223	1.117	0	106	35.6	158	1.242	4.79	30	
Dibromochloromethane	1.04	0.0335	1.117	0	92.9	55.3	140	1.057	1.87	30	
1,2-Dibromoethane (EDB)	1.15	0.00558	1.117	0	103	50.4	136	1.172	2.07	30	
Chlorobenzene	1.17	0.0223	1.117	0	105	60	133	1.231	4.97	30	
1,1,1,2-Tetrachloroethane	1.07	0.0335	1.117	0	95.6	53.1	142	1.116	4.45	30	
Ethylbenzene	1.16	0.0335	1.117	0.01340	102	54.5	134	1.221	5.40	30	

Work Order: 1610007
 CLIENT: GeoEngineers
 Project: Rufus - Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610034-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607476

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	2.33	0.0223	2.234	0.02681	103	53.1	132	2.451	5.12	30	
o-Xylene	1.18	0.0223	1.117	0	105	53.3	139	1.244	5.63	30	
Styrene	1.18	0.0223	1.117	0	106	51.1	132	1.240	4.79	30	
Isopropylbenzene	1.21	0.0894	1.117	0.02178	107	58.9	138	1.278	5.25	30	
Bromoform	0.967	0.0223	1.117	0	86.6	57.9	130	0.9751	0.863	30	
1,1,2,2-Tetrachloroethane	1.12	0.0223	1.117	0	99.9	51.9	131	1.136	1.79	30	
n-Propylbenzene	1.24	0.0223	1.117	0.04021	108	53.6	140	1.314	5.73	30	
Bromobenzene	1.20	0.0335	1.117	0	108	54.2	140	1.248	3.78	30	
1,3,5-Trimethylbenzene	1.25	0.0223	1.117	0.03239	109	51.8	136	1.309	4.36	30	
2-Chlorotoluene	1.17	0.0223	1.117	0	105	51.6	136	1.225	4.52	30	
4-Chlorotoluene	1.18	0.0223	1.117	0	106	50.1	139	1.238	4.95	30	
tert-Butylbenzene	1.23	0.0223	1.117	0	110	50.5	135	1.290	4.79	30	
1,2,3-Trichloropropane	1.12	0.0223	1.117	0	100	50.5	131	1.143	2.12	30	
1,2,4-Trichlorobenzene	1.32	0.0558	1.117	0	118	50.8	130	1.321	0.296	30	
sec-Butylbenzene	1.28	0.0223	1.117	0.04691	110	52.6	141	1.352	5.56	30	
4-Isopropyltoluene	1.32	0.0223	1.117	0.04412	114	52.9	134	1.386	5.08	30	
1,3-Dichlorobenzene	1.23	0.0223	1.117	0	110	52.6	131	1.249	1.81	30	
1,4-Dichlorobenzene	1.20	0.0223	1.117	0	107	52.9	129	1.207	0.883	30	
n-Butylbenzene	1.44	0.0223	1.117	0.08489	121	52.6	130	1.490	3.43	30	
1,2-Dichlorobenzene	1.23	0.0223	1.117	0	110	55.8	129	1.244	0.811	30	
1,2-Dibromo-3-chloropropane	1.04	0.558	1.117	0	93.4	40.5	131	0.9807	6.13	30	
1,2,4-Trimethylbenzene	1.39	0.0223	1.117	0.1312	112	50.6	137	1.438	3.68	30	
Hexachlorobutadiene	1.44	0.112	1.117	0	129	40.6	158	1.482	2.98	30	
Naphthalene	1.47	0.0335	1.117	0.1273	120	52.3	124	1.446	1.34	30	
1,2,3-Trichlorobenzene	1.28	0.0223	1.117	0	114	54.4	124	1.295	1.35	30	
Surr: Dibromofluoromethane	1.37		1.396		97.8	56.5	129		0		
Surr: Toluene-d8	1.44		1.396		103	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.45		1.396		104	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Client Name: **GEI**
 Logged by: **Erica Silva**

Work Order Number: **1610007**
 Date Received: **9/30/2016 4:30:00 PM**

Chain of Custody

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

Log In

3. Coolers are present? Yes No NA

No cooler present

4. Shipping container/cooler in good condition? Yes No
 5. Custody Seals present on shipping container/cooler?
 (Refer to comments for Custody Seals not intact) Yes No Not Required

6. Was an attempt made to cool the samples? Yes No NA

Unknown prior to receipt

7. Were all items received at a temperature of >0°C to 10.0°C* Yes No NA

Please refer to Item Information

8. Sample(s) in proper container(s)? Yes No
 9. Sufficient sample volume for indicated test(s)? Yes No
 10. Are samples properly preserved? Yes No
 11. Was preservative added to bottles? Yes No NA
 12. Is there headspace in the VOA vials? Yes No NA
 13. Did all samples containers arrive in good condition(unbroken)? Yes No
 14. Does paperwork match bottle labels? Yes No
 15. Are matrices correctly identified on Chain of Custody? Yes No
 16. Is it clear what analyses were requested? Yes No
 17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Sample	21.8

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



Fremont

Analytical

3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record and Laboratory Services Agreement

Date: 9/30/16

Laboratory Project No (Internal):

1610007

Page: 1 of 1

Client: Geo Engineers

Project Name:

Rufus - Block 20

Project No:

20434-001-24

Collected by:

Sydney Branson

Address: _____
City, State, zip: _____

Location:

Seattle

Report To (PM):

Chris Branson

Telephone: _____ Fax: _____

PM Email:

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

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Analytes														Comments
				VOCs (EPA 8260 / 624)	GV/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	Metals** (EPA 6020 / 200.8)	Total (T) / Dissolved (D)	Anions (C)***	EDB (801)	Turn-around times for samples received after 4:00pm will begin on the following business day.		
1 SC-1-5.0	9/30/16	1120	S	X	X	X	X	X	X	X	X	X	X	X	X			
2 SC-2-15.0	9/30/16	1125	S	X	X	X	X	X	X	X	X	X	X	X	X			
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

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

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite
Sample Disposal: Return to Client Disposal by Lab (Samples will be held for 30 days unless otherwise noted. A fee may be assessed if samples are retained after 30 days.)

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

Relinquished Date/Time: 9/30/16 16:30 Received Date/Time: 9/30/16 16:30

Relinquished Date/Time: _____ Received Date/Time: _____

Relinquished Date/Time: _____ Received Date/Time: _____

Relinquished Date/Time: _____ Received Date/Time: _____

Relinquished Date/Time: _____ Received Date/Time: _____



GeoEngineers

Chris Brown
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Rufus Block 20
Work Order Number: 1610034

October 11, 2016

Attention Chris Brown:

Fremont Analytical, Inc. received 1 sample(s) on 10/4/2016 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Gasoline by NWTPH-Gx
Hexavalent Chromium by EPA Method 7196
Mercury by EPA Method 7471
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)
Total Metals by EPA Method 6020
Volatile Organic Compounds by EPA Method 8260C

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director



CLIENT: GeoEngineers
Project: Rufus Block 20
Work Order: 1610034

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1610034-001	W9-SP-25	10/04/2016 11:30 AM	10/04/2016 12:05 PM

CLIENT: GeoEngineers

Project: Rufus Block 20

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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



Qualifiers:

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

Acronyms:

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



Client: GeoEngineers

Collection Date: 10/4/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1610034-001

Matrix: Soil

Client Sample ID: W9-SP-25

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15013

Analyst: WC

Diesel (Fuel Oil)	ND	22.9		mg/Kg-dry	1	10/4/2016 3:54:00 PM
Heavy Oil	ND	57.1		mg/Kg-dry	1	10/4/2016 3:54:00 PM
Heavy Oil Range Organics (C24-37)	135	57.1		mg/Kg-dry	1	10/4/2016 3:54:00 PM
Surr: 2-Fluorobiphenyl	94.4	50-150		%Rec	1	10/4/2016 3:54:00 PM
Surr: o-Terphenyl	96.3	50-150		%Rec	1	10/4/2016 3:54:00 PM

NOTES:

Heavy Oil Range Organics - Indicates the presence of unresolved compounds in the Lube+ Oil ranges.

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15014

Analyst: BT

Naphthalene	ND	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
2-Methylnaphthalene	ND	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
1-Methylnaphthalene	ND	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Acenaphthylene	ND	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Acenaphthene	ND	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Fluorene	ND	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Phenanthrene	727	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Anthracene	108	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Fluoranthene	1,890	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Pyrene	1,520	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Benz(a)anthracene	776	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Chrysene	666	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Benzo(b)fluoranthene	1,220	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Benzo(k)fluoranthene	383	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Benzo(a)pyrene	827	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Indeno(1,2,3-cd)pyrene	381	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Dibenz(a,h)anthracene	140	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Benzo(g,h,i)perylene	319	43.3		µg/Kg-dry	1	10/5/2016 5:52:14 AM
Surr: 2-Fluorobiphenyl	72.0	32.2-123		%Rec	1	10/5/2016 5:52:14 AM
Surr: Terphenyl-d14 (surr)	88.3	42.2-152		%Rec	1	10/5/2016 5:52:14 AM

Gasoline by NWTPH-Gx

Batch ID: 15016

Analyst: NG

Gasoline	ND	5.58		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Gasoline Range Organics (C6-C12)	39.8	5.58		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Surr: Toluene-d8	99.1	65-135		%Rec	1	10/4/2016 11:35:55 PM
Surr: 4-Bromofluorobenzene	102	65-135		%Rec	1	10/4/2016 11:35:55 PM

NOTES:

GRO - Indicates the presence of unresolved compounds eluting from toluene to dodecane (~C7->C12).



Client: GeoEngineers

Collection Date: 10/4/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1610034-001

Matrix: Soil

Client Sample ID: W9-SP-25

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15016

Analyst: NG

Dichlorodifluoromethane (CFC-12)	ND	0.0670	Q	mg/Kg-dry	1	10/4/2016 11:35:55 PM
Chloromethane	ND	0.0670		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Vinyl chloride	ND	0.00223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Bromomethane	ND	0.101		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Trichlorofluoromethane (CFC-11)	ND	0.0558		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Chloroethane	ND	0.0670		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,1-Dichloroethene	ND	0.0558		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Methylene chloride	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
trans-1,2-Dichloroethene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Methyl tert-butyl ether (MTBE)	ND	0.0558		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,1-Dichloroethane	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
2,2-Dichloropropane	ND	0.0558	Q	mg/Kg-dry	1	10/4/2016 11:35:55 PM
cis-1,2-Dichloroethene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Chloroform	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,1,1-Trichloroethane (TCA)	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,1-Dichloropropene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Carbon tetrachloride	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2-Dichloroethane (EDC)	ND	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Benzene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Trichloroethene (TCE)	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2-Dichloropropane	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Bromodichloromethane	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Dibromomethane	ND	0.0447		mg/Kg-dry	1	10/4/2016 11:35:55 PM
cis-1,3-Dichloropropene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Toluene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
trans-1,3-Dichloropropylene	ND	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,1,2-Trichloroethane	ND	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,3-Dichloropropane	ND	0.0558		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Tetrachloroethene (PCE)	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Dibromochloromethane	ND	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2-Dibromoethane (EDB)	ND	0.00558		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Chlorobenzene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,1,1,2-Tetrachloroethane	ND	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Ethylbenzene	ND	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
m,p-Xylene	0.0268	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
o-Xylene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Styrene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Isopropylbenzene	ND	0.0894		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Bromoform	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM



Client: GeoEngineers

Collection Date: 10/4/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1610034-001

Matrix: Soil

Client Sample ID: W9-SP-25

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15016

Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
n-Propylbenzene	0.0402	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Bromobenzene	ND	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,3,5-Trimethylbenzene	0.0324	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
2-Chlorotoluene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
4-Chlorotoluene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
tert-Butylbenzene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2,3-Trichloropropane	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2,4-Trichlorobenzene	ND	0.0558		mg/Kg-dry	1	10/4/2016 11:35:55 PM
sec-Butylbenzene	0.0469	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
4-Isopropyltoluene	0.0441	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,3-Dichlorobenzene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,4-Dichlorobenzene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
n-Butylbenzene	0.0849	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2-Dichlorobenzene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2-Dibromo-3-chloropropane	ND	0.558		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2,4-Trimethylbenzene	0.131	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Hexachlorobutadiene	ND	0.112		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Naphthalene	0.127	0.0335		mg/Kg-dry	1	10/4/2016 11:35:55 PM
1,2,3-Trichlorobenzene	ND	0.0223		mg/Kg-dry	1	10/4/2016 11:35:55 PM
Surr: Dibromofluoromethane	94.7	56.5-129		%Rec	1	10/4/2016 11:35:55 PM
Surr: Toluene-d8	102	64.3-131		%Rec	1	10/4/2016 11:35:55 PM
Surr: 1-Bromo-4-fluorobenzene	100	63.1-141		%Rec	1	10/4/2016 11:35:55 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15024

Analyst: MW

Mercury	ND	0.265		mg/Kg-dry	1	10/5/2016 12:00:21 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15015

Analyst: TN

Arsenic	3.64	0.0873		mg/Kg-dry	1	10/5/2016 11:10:36 AM
Cadmium	ND	0.175		mg/Kg-dry	1	10/5/2016 11:10:36 AM
Chromium	38.4	0.0873		mg/Kg-dry	1	10/5/2016 11:10:36 AM
Lead	8.08	0.175		mg/Kg-dry	1	10/5/2016 11:10:36 AM



Client: GeoEngineers

Collection Date: 10/4/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1610034-001

Matrix: Soil

Client Sample ID: W9-SP-25

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
-----------------	---------------	-----------	-------------	--------------	-----------	----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32111 Analyst: CG

Percent Moisture	12.6			wt%	1	10/4/2016 1:16:09 PM
------------------	------	--	--	-----	---	----------------------

Hexavalent Chromium by EPA Method 7196

Batch ID: 15060 Analyst: KT

Chromium, Hexavalent	ND	0.567		mg/Kg-dry	1	10/7/2016 2:05:00 PM
----------------------	----	-------	--	-----------	---	----------------------

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-15013	SampType: MBLK	Units: mg/Kg	Prep Date: 10/4/2016	RunNo: 32121							
Client ID: MBLKS	Batch ID: 15013		Analysis Date: 10/4/2016	SeqNo: 607429							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	18.9		20.00		94.7	50	150				
Surr: o-Terphenyl	18.7		20.00		93.6	50	150				

Sample ID LCS-15013	SampType: LCS	Units: mg/Kg	Prep Date: 10/4/2016	RunNo: 32121							
Client ID: LCSS	Batch ID: 15013		Analysis Date: 10/4/2016	SeqNo: 607428							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	501	20.0	500.0	0	100	65	135				
Surr: 2-Fluorobiphenyl	22.9		20.00		114	50	150				
Surr: o-Terphenyl	22.2		20.00		111	50	150				

Sample ID 1610007-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32121							
Client ID: BATCH	Batch ID: 15013		Analysis Date: 10/4/2016	SeqNo: 607403							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	21.9						0		30	
Heavy Oil	119	54.9						36.35	107	30	R
Surr: 2-Fluorobiphenyl	19.7		21.94		89.7	50	150		0		
Surr: o-Terphenyl	19.6		21.94		89.4	50	150		0		

NOTES:

R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).

Sample ID 1610007-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32121							
Client ID: BATCH	Batch ID: 15013		Analysis Date: 10/4/2016	SeqNo: 607404							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	581	23.3	582.5	0	99.7	65	135				
Surr: 2-Fluorobiphenyl	24.2		23.30		104	50	150				

Work Order: 1610034
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1610007-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32121					
Client ID: BATCH	Batch ID: 15013				Analysis Date: 10/4/2016	SeqNo: 607404					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: o-Terphenyl 24.8 23.30 106 50 150

Sample ID 1610007-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32121					
Client ID: BATCH	Batch ID: 15013				Analysis Date: 10/4/2016	SeqNo: 607405					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil) 509 21.1 528.1 0 96.4 65 135 580.7 13.1 30
 Surr: 2-Fluorobiphenyl 21.7 21.12 103 50 150 0
 Surr: o-Terphenyl 22.0 21.12 104 50 150 0

Sample ID 1610041-006ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32121					
Client ID: BATCH	Batch ID: 15013				Analysis Date: 10/5/2016	SeqNo: 607418					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil) ND 18.5 0 30
 Heavy Oil ND 46.3 0 30
 Surr: 2-Fluorobiphenyl 18.6 18.50 100 50 150 0
 Surr: o-Terphenyl 18.4 18.50 99.4 50 150 0

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID LCS-15016	SampType: LCS	Units: mg/Kg			Prep Date: 10/4/2016	RunNo: 32131					
Client ID: LCSS	Batch ID: 15016				Analysis Date: 10/4/2016	SeqNo: 607498					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	26.0	5.00	25.00	0	104	65	135				
Surr: Toluene-d8	1.25		1.250		99.9	65	135				
Surr: 4-Bromofluorobenzene	1.26		1.250		101	65	135				

Sample ID MB-15016	SampType: MBLK	Units: mg/Kg			Prep Date: 10/4/2016	RunNo: 32131					
Client ID: MBLKS	Batch ID: 15016				Analysis Date: 10/4/2016	SeqNo: 607499					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.26		1.250		101	65	135				
Surr: 4-Bromofluorobenzene	1.23		1.250		98.6	65	135				

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32131					
Client ID: BATCH	Batch ID: 15016				Analysis Date: 10/4/2016	SeqNo: 607491					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	4.57						0		30	
Surr: Toluene-d8	1.12		1.141		97.9	65	135		0		
Surr: 4-Bromofluorobenzene	1.14		1.141		99.5	65	135		0		

Sample ID 1610007-002BMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32131					
Client ID: BATCH	Batch ID: 15016				Analysis Date: 10/5/2016	SeqNo: 607493					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	45.7	5.82	29.10	0	157	65	135				S
Surr: Toluene-d8	1.43		1.455		98.4	65	135				
Surr: 4-Bromofluorobenzene	1.55		1.455		106	65	135				

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID	1610007-002BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/4/2016	RunNo:	32131		
Client ID:	BATCH	Batch ID:	15016			Analysis Date:	10/5/2016	SeqNo:	607494		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	43.5	5.82	29.10	0	150	65	135	45.73	4.91	30	S
Surr: Toluene-d8	1.42		1.455		97.8	65	135		0		
Surr: 4-Bromofluorobenzene	1.56		1.455		107	65	135		0		

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Hexavalent Chromium by EPA Method 7196

Sample ID 1610034-001APDS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/7/2016	RunNo: 32206							
Client ID: W9-SP-25	Batch ID: 15060		Analysis Date: 10/7/2016	SeqNo: 609083							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	3.39	0.567	2.837	0.1248	115	65	135				

Sample ID 1610064-005ADUP	SampType: DUP	Units: mg/Kg	Prep Date: 10/7/2016	RunNo: 32206							
Client ID: BATCH	Batch ID: 15060		Analysis Date: 10/7/2016	SeqNo: 609085							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	62.0	14.8						69.20	10.9	30	D

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-15024	SampType: MBLK	Units: mg/Kg	Prep Date: 10/5/2016	RunNo: 32135							
Client ID: MBLKS	Batch ID: 15024		Analysis Date: 10/5/2016	SeqNo: 607737							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.227

Sample ID LCS-15024	SampType: LCS	Units: mg/Kg	Prep Date: 10/5/2016	RunNo: 32135							
Client ID: LCSS	Batch ID: 15024		Analysis Date: 10/5/2016	SeqNo: 607759							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.526 0.240 0.4808 0 109 80 120

Sample ID 1610034-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/5/2016	RunNo: 32135							
Client ID: W9-SP-25	Batch ID: 15024		Analysis Date: 10/5/2016	SeqNo: 607741							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.280 0 20

Sample ID 1610034-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/5/2016	RunNo: 32135							
Client ID: W9-SP-25	Batch ID: 15024		Analysis Date: 10/5/2016	SeqNo: 607742							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.633 0.275 0.5499 0.02637 110 70 130

Sample ID 1610034-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/5/2016	RunNo: 32135							
Client ID: W9-SP-25	Batch ID: 15024		Analysis Date: 10/5/2016	SeqNo: 607743							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.588 0.251 0.5017 0.02637 112 70 130 0.6335 7.46 20

Work Order: 1610034
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID MB-15014	SampType: MBLK	Units: µg/Kg	Prep Date: 10/4/2016	RunNo: 32139							
Client ID: MBLKS	Batch ID: 15014		Analysis Date: 10/5/2016	SeqNo: 607573							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	364		500.0		72.7	32.2	123				
Surr: Terphenyl-d14 (surr)	429		500.0		85.8	42.2	152				

Sample ID LCS-15014	SampType: LCS	Units: µg/Kg	Prep Date: 10/4/2016	RunNo: 32139							
Client ID: LCSS	Batch ID: 15014		Analysis Date: 10/5/2016	SeqNo: 607574							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	799	40.0	1,000	0	79.9	51.6	136				
2-Methylnaphthalene	821	40.0	1,000	0	82.1	45.1	135				
1-Methylnaphthalene	812	40.0	1,000	0	81.2	46.2	133				
Acenaphthylene	769	40.0	1,000	0	76.9	32.8	136				
Acenaphthene	772	40.0	1,000	0	77.2	38.7	129				

Work Order: 1610034
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	LCS-15014	SampType:	LCS	Units:	µg/Kg	Prep Date:	10/4/2016	RunNo:	32139		
Client ID:	LCSS	Batch ID:	15014	Analysis Date:	10/5/2016	SeqNo:	607574				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	782	40.0	1,000	0	78.2	41.1	132				
Phenanthrene	729	40.0	1,000	0	72.9	43.9	133				
Anthracene	920	40.0	1,000	0	92.0	44.2	136				
Fluoranthene	775	40.0	1,000	0	77.5	45.9	137				
Pyrene	788	40.0	1,000	0	78.8	46.2	137				
Benz(a)anthracene	729	40.0	1,000	0	72.9	41.9	136				
Chrysene	745	40.0	1,000	0	74.5	46.9	138				
Benzo(b)fluoranthene	689	40.0	1,000	0	68.9	35.9	148				
Benzo(k)fluoranthene	772	40.0	1,000	0	77.2	43.9	144				
Benzo(a)pyrene	675	40.0	1,000	0	67.5	36.3	144				
Indeno(1,2,3-cd)pyrene	761	40.0	1,000	0	76.1	41	140				
Dibenz(a,h)anthracene	755	40.0	1,000	0	75.5	33.8	133				
Benzo(g,h,i)perylene	704	40.0	1,000	0	70.4	32.9	112				
Surr: 2-Fluorobiphenyl	324		500.0		64.8	32.2	123				
Surr: Terphenyl-d14 (surr)	389		500.0		77.8	42.2	152				

Sample ID	1609374-001ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	10/4/2016	RunNo:	32139		
Client ID:	BATCH	Batch ID:	15014	Analysis Date:	10/5/2016	SeqNo:	607576				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	41.1						0		30	
2-Methylnaphthalene	ND	41.1						0		30	
1-Methylnaphthalene	ND	41.1						0		30	
Acenaphthylene	ND	41.1						0		30	
Acenaphthene	ND	41.1						0		30	
Fluorene	ND	41.1						0		30	
Phenanthrene	ND	41.1						0		30	
Anthracene	ND	41.1						0		30	
Fluoranthene	ND	41.1						0		30	
Pyrene	ND	41.1						0		30	

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1609374-001ADUP	SampType: DUP	Units: µg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: BATCH	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607576				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	ND	41.1						0		30	
Chrysene	ND	41.1						0		30	
Benzo(b)fluoranthene	ND	41.1						0		30	
Benzo(k)fluoranthene	ND	41.1						0		30	
Benzo(a)pyrene	ND	41.1						0		30	
Indeno(1,2,3-cd)pyrene	ND	41.1						0		30	
Dibenz(a,h)anthracene	ND	41.1						0		30	
Benzo(g,h,i)perylene	ND	41.1						0		30	
Surr: 2-Fluorobiphenyl	361		513.4		70.2	32.2	123		0		
Surr: Terphenyl-d14 (surr)	415		513.4		80.7	42.2	152		0		

Sample ID 1609374-001AMS	SampType: MS	Units: µg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: BATCH	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607577				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	721	36.3	907.6	0	79.5	42.9	138				
2-Methylnaphthalene	746	36.3	907.6	0	82.2	42.8	151				
1-Methylnaphthalene	749	36.3	907.6	0	82.5	41.6	148				
Acenaphthylene	703	36.3	907.6	0	77.4	32.6	160				
Acenaphthene	716	36.3	907.6	0	78.9	46.3	142				
Fluorene	728	36.3	907.6	0	80.2	43.4	153				
Phenanthrene	696	36.3	907.6	2.237	76.5	45.5	140				
Anthracene	860	36.3	907.6	0	94.7	32.6	160				
Fluoranthene	770	36.3	907.6	0	84.8	44.6	161				
Pyrene	775	36.3	907.6	2.828	85.1	48.3	158				
Benz(a)anthracene	728	36.3	907.6	5.790	79.6	57.5	169				
Chrysene	692	36.3	907.6	1.958	76.0	45.2	146				
Benzo(b)fluoranthene	786	36.3	907.6	11.90	85.2	42.2	168				
Benzo(k)fluoranthene	719	36.3	907.6	12.49	77.8	48	161				
Benzo(a)pyrene	720	36.3	907.6	13.05	77.9	34.4	179				

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1609374-001AMS	SampType: MS	Units: µg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: BATCH	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607577				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	805	36.3	907.6	11.22	87.5	41.1	165				
Dibenz(a,h)anthracene	785	36.3	907.6	12.33	85.2	38.1	166				
Benzo(g,h,i)perylene	730	36.3	907.6	9.643	79.4	45.6	157				
Surr: 2-Fluorobiphenyl	330		453.8		72.6	32.2	123				
Surr: Terphenyl-d14 (surr)	380		453.8		83.6	42.2	152				

Sample ID 1609374-001AMSD	SampType: MSD	Units: µg/Kg-dry				Prep Date: 10/4/2016	RunNo: 32139				
Client ID: BATCH	Batch ID: 15014					Analysis Date: 10/5/2016	SeqNo: 607578				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	861	41.8	1,045	0	82.4	42.9	138	721.5	17.7	30	
2-Methylnaphthalene	936	41.8	1,045	0	89.5	42.8	151	746.1	22.5	30	
1-Methylnaphthalene	869	41.8	1,045	0	83.1	41.6	148	748.7	14.9	30	
Acenaphthylene	864	41.8	1,045	0	82.7	32.6	160	702.8	20.6	30	
Acenaphthene	870	41.8	1,045	0	83.2	46.3	142	716.4	19.3	30	
Fluorene	883	41.8	1,045	0	84.5	43.4	153	727.9	19.3	30	
Phenanthrene	844	41.8	1,045	2.237	80.5	45.5	140	696.2	19.2	30	
Anthracene	874	41.8	1,045	0	83.6	32.6	160	859.8	1.64	30	
Fluoranthene	922	41.8	1,045	0	88.2	44.6	161	769.8	18.0	30	
Pyrene	919	41.8	1,045	2.828	87.6	48.3	158	774.9	17.0	30	
Benz(a)anthracene	888	41.8	1,045	5.790	84.5	57.5	169	728.2	19.8	30	
Chrysene	830	41.8	1,045	1.958	79.3	45.2	146	691.9	18.2	30	
Benzo(b)fluoranthene	852	41.8	1,045	11.90	80.4	42.2	168	785.6	8.06	30	
Benzo(k)fluoranthene	912	41.8	1,045	12.49	86.1	48	161	718.6	23.8	30	
Benzo(a)pyrene	862	41.8	1,045	13.05	81.2	34.4	179	719.8	17.9	30	
Indeno(1,2,3-cd)pyrene	967	41.8	1,045	11.22	91.5	41.1	165	805.3	18.2	30	
Dibenz(a,h)anthracene	945	41.8	1,045	12.33	89.3	38.1	166	785.3	18.5	30	
Benzo(g,h,i)perylene	806	41.8	1,045	9.643	76.2	45.6	157	730.0	9.95	30	
Surr: 2-Fluorobiphenyl	384		522.5		73.6	32.2	123		0		
Surr: Terphenyl-d14 (surr)	449		522.5		85.9	42.2	152		0		



Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1609374-001AMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32139							
Client ID: BATCH	Batch ID: 15014	Analysis Date: 10/5/2016	SeqNo: 607578								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual



Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID 1610034-001ADUP	SampType: DUP	Units: wt%	Prep Date: 10/4/2016	RunNo: 32111							
Client ID: W9-SP-25	Batch ID: R32111	Analysis Date: 10/4/2016	SeqNo: 607135								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	11.3	0.500						12.57	10.8	20	

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-15015	SampType: MBLK	Units: mg/Kg			Prep Date: 10/4/2016	RunNo: 32133					
Client ID: MBLKS	Batch ID: 15015				Analysis Date: 10/5/2016	SeqNo: 607517					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	ND	0.0752									
Cadmium	ND	0.150									
Chromium	ND	0.0752									
Lead	ND	0.150									

Sample ID LCS-15015	SampType: LCS	Units: mg/Kg			Prep Date: 10/4/2016	RunNo: 32133					
Client ID: LCSS	Batch ID: 15015				Analysis Date: 10/5/2016	SeqNo: 607518					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	37.8	0.0746	37.31	0	101	80	120				
Cadmium	1.94	0.149	1.866	0	104	80	120				
Chromium	39.8	0.0746	37.31	0	107	80	120				
Lead	19.7	0.149	18.66	0	105	80	120				

Sample ID 1610009-001ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32133					
Client ID: BATCH	Batch ID: 15015				Analysis Date: 10/5/2016	SeqNo: 607520					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	4.58	0.0831						4.202	8.66	20	
Cadmium	ND	0.166						0		20	
Chromium	25.8	0.0831						39.88	43.0	20	R
Lead	10.0	0.166						12.35	20.8	20	R

NOTES:

R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID 1610009-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32133					
Client ID: BATCH	Batch ID: 15015				Analysis Date: 10/5/2016	SeqNo: 607524					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	47.9	0.0838	41.89	4.202	104	75	125				
---------	------	--------	-------	-------	-----	----	-----	--	--	--	--

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1610009-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32133					
Client ID: BATCH	Batch ID: 15015				Analysis Date: 10/5/2016	SeqNo: 607524					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Cadmium	2.21	0.168	2.094	0.1205	99.5	75	125				
Chromium	79.1	0.0838	41.89	39.88	93.6	75	125				
Lead	35.0	0.168	20.94	12.35	108	75	125				

Sample ID 1610009-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 10/4/2016	RunNo: 32133					
Client ID: BATCH	Batch ID: 15015				Analysis Date: 10/5/2016	SeqNo: 607525					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	50.2	0.0838	41.89	4.202	110	75	125	47.93	4.59	20	
Cadmium	2.25	0.168	2.094	0.1205	102	75	125	2.205	2.14	20	
Chromium	77.8	0.0838	41.89	39.88	90.6	75	125	79.10	1.62	20	
Lead	31.4	0.168	20.94	12.35	91.0	75	125	35.00	10.8	20	

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15016	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130		
Client ID:	LCSS	Batch ID:	15016	Analysis Date:	10/4/2016	SeqNo:	607479				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.430	0.0600	1.000	0	43.0	34.5	141				Q
Chloromethane	0.761	0.0600	1.000	0	76.1	38.8	132				
Vinyl chloride	0.754	0.00200	1.000	0	75.4	44	142				
Bromomethane	1.02	0.0900	1.000	0	102	40.9	157				
Trichlorofluoromethane (CFC-11)	0.844	0.0500	1.000	0	84.4	42.9	147				
Chloroethane	0.900	0.0600	1.000	0	90.0	37.1	144				
1,1-Dichloroethene	0.938	0.0500	1.000	0	93.8	49.7	142				
Methylene chloride	1.03	0.0200	1.000	0	103	46.3	140				
trans-1,2-Dichloroethene	1.01	0.0200	1.000	0	101	68	130				
Methyl tert-butyl ether (MTBE)	1.03	0.0500	1.000	0	103	59.1	138				
1,1-Dichloroethane	1.04	0.0200	1.000	0	104	61.9	137				
2,2-Dichloropropane	1.34	0.0500	1.000	0	134	28.1	149				Q
cis-1,2-Dichloroethene	1.06	0.0200	1.000	0	106	71.3	135				
Chloroform	1.04	0.0200	1.000	0	104	67.5	129				
1,1,1-Trichloroethane (TCA)	1.02	0.0200	1.000	0	102	69	132				
1,1-Dichloropropene	1.01	0.0200	1.000	0	101	72.7	131				
Carbon tetrachloride	1.07	0.0200	1.000	0	107	63.4	137				
1,2-Dichloroethane (EDC)	1.04	0.0300	1.000	0	104	61.9	136				
Benzene	1.07	0.0200	1.000	0	107	64.3	133				
Trichloroethene (TCE)	1.05	0.0200	1.000	0	105	65.5	137				
1,2-Dichloropropane	1.10	0.0200	1.000	0	110	63.2	142				
Bromodichloromethane	1.05	0.0200	1.000	0	105	73.2	131				
Dibromomethane	1.08	0.0400	1.000	0	108	70	130				
cis-1,3-Dichloropropene	1.11	0.0200	1.000	0	111	59.1	143				
Toluene	1.11	0.0200	1.000	0	111	67.3	138				
trans-1,3-Dichloropropylene	1.14	0.0300	1.000	0	114	49.2	149				
1,1,2-Trichloroethane	1.11	0.0300	1.000	0	111	74.5	129				
1,3-Dichloropropane	1.08	0.0500	1.000	0	108	70	130				
Tetrachloroethene (PCE)	1.07	0.0200	1.000	0	107	52.7	150				
Dibromochloromethane	1.08	0.0300	1.000	0	108	70.6	144				
1,2-Dibromoethane (EDB)	1.06	0.00500	1.000	0	106	70	130				

Work Order: 1610034
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15016	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130		
Client ID:	LCSS	Batch ID:	15016	Analysis Date:	10/4/2016	SeqNo:	607479				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	1.09	0.0200	1.000	0	109	76.1	123				
1,1,1,2-Tetrachloroethane	1.08	0.0300	1.000	0	108	65.9	141				
Ethylbenzene	1.05	0.0300	1.000	0	105	74	129				
m,p-Xylene	2.12	0.0200	2.000	0	106	70	124				
o-Xylene	1.05	0.0200	1.000	0	105	72.7	124				
Styrene	1.06	0.0200	1.000	0	106	76.8	130				
Isopropylbenzene	1.05	0.0800	1.000	0	105	70	130				
Bromoform	1.10	0.0200	1.000	0	110	67	154				
1,1,2,2-Tetrachloroethane	1.07	0.0200	1.000	0	107	60	130				
n-Propylbenzene	1.06	0.0200	1.000	0	106	74.8	125				
Bromobenzene	1.10	0.0300	1.000	0	110	49.2	144				
1,3,5-Trimethylbenzene	1.06	0.0200	1.000	0	106	74.6	123				
2-Chlorotoluene	1.06	0.0200	1.000	0	106	76.7	129				
4-Chlorotoluene	1.05	0.0200	1.000	0	105	77.5	125				
tert-Butylbenzene	1.05	0.0200	1.000	0	105	66.2	130				
1,2,3-Trichloropropane	1.09	0.0200	1.000	0	109	67.9	136				
1,2,4-Trichlorobenzene	1.12	0.0500	1.000	0	112	62.6	143				
sec-Butylbenzene	1.05	0.0200	1.000	0	105	75.6	133				
4-Isopropyltoluene	1.06	0.0200	1.000	0	106	76.8	131				
1,3-Dichlorobenzene	1.09	0.0200	1.000	0	109	72.8	128				
1,4-Dichlorobenzene	1.06	0.0200	1.000	0	106	72.6	126				
n-Butylbenzene	1.10	0.0200	1.000	0	110	65.3	136				
1,2-Dichlorobenzene	1.10	0.0200	1.000	0	110	72.8	126				
1,2-Dibromo-3-chloropropane	1.14	0.500	1.000	0	114	61.2	139				
1,2,4-Trimethylbenzene	1.07	0.0200	1.000	0	107	77.5	129				
Hexachlorobutadiene	1.11	0.100	1.000	0	111	42	151				
Naphthalene	1.15	0.0300	1.000	0	115	62.3	134				
1,2,3-Trichlorobenzene	1.12	0.0200	1.000	0	112	54.8	143				
Surr: Dibromofluoromethane	1.28		1.250		103	56.5	129				
Surr: Toluene-d8	1.28		1.250		103	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.31		1.250		104	63.1	141				

Work Order: 1610034
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15016	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130				
Client ID:	LCSS	Batch ID:	15016			Analysis Date:	10/4/2016	SeqNo:	607479				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	MB-15016	SampType:	MBLK	Units:	mg/Kg	Prep Date:	10/4/2016	RunNo:	32130				
Client ID:	MBLKS	Batch ID:	15016			Analysis Date:	10/4/2016	SeqNo:	607480				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)		ND		0.0600									Q
Chloromethane		ND		0.0600									
Vinyl chloride		ND		0.00200									
Bromomethane		ND		0.0900									
Trichlorofluoromethane (CFC-11)		ND		0.0500									
Chloroethane		ND		0.0600									
1,1-Dichloroethene		ND		0.0500									
Methylene chloride		ND		0.0200									
trans-1,2-Dichloroethene		ND		0.0200									
Methyl tert-butyl ether (MTBE)		ND		0.0500									
1,1-Dichloroethane		ND		0.0200									
2,2-Dichloropropane		ND		0.0500									Q
cis-1,2-Dichloroethene		ND		0.0200									
Chloroform		ND		0.0200									
1,1,1-Trichloroethane (TCA)		ND		0.0200									
1,1-Dichloropropene		ND		0.0200									
Carbon tetrachloride		ND		0.0200									
1,2-Dichloroethane (EDC)		ND		0.0300									
Benzene		ND		0.0200									
Trichloroethene (TCE)		ND		0.0200									
1,2-Dichloropropane		ND		0.0200									
Bromodichloromethane		ND		0.0200									
Dibromomethane		ND		0.0400									
cis-1,3-Dichloropropene		ND		0.0200									

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15016	SampType: MBLK	Units: mg/Kg	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: MBLKS	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607480							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									
1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									
tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									
sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									
1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									
1,2-Dichlorobenzene	ND	0.0200									
1,2-Dibromo-3-chloropropane	ND	0.500									

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15016	SampType: MBLK	Units: mg/Kg	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: MBLKS	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607480							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.24		1.250		99.4	56.5	129				
Surr: Toluene-d8	1.25		1.250		100	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.22		1.250		97.2	63.1	141				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607470							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0548						0		30	Q
Chloromethane	ND	0.0548						0		30	
Vinyl chloride	ND	0.00183						0		30	
Bromomethane	ND	0.0822						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0457						0		30	
Chloroethane	ND	0.0548						0		30	
1,1-Dichloroethene	ND	0.0457						0		30	
Methylene chloride	ND	0.0183						0		30	
trans-1,2-Dichloroethene	ND	0.0183						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0457						0		30	
1,1-Dichloroethane	ND	0.0183						0		30	
2,2-Dichloropropane	ND	0.0457						0		30	Q
cis-1,2-Dichloroethene	ND	0.0183						0		30	
Chloroform	ND	0.0183						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0183						0		30	
1,1-Dichloropropene	ND	0.0183						0		30	
Carbon tetrachloride	ND	0.0183						0		30	

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607470							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dichloroethane (EDC)	ND	0.0274						0		30	
Benzene	ND	0.0183						0		30	
Trichloroethene (TCE)	ND	0.0183						0		30	
1,2-Dichloropropane	ND	0.0183						0		30	
Bromodichloromethane	ND	0.0183						0		30	
Dibromomethane	ND	0.0365						0		30	
cis-1,3-Dichloropropene	ND	0.0183						0		30	
Toluene	ND	0.0183						0		30	
trans-1,3-Dichloropropylene	ND	0.0274						0		30	
1,1,2-Trichloroethane	ND	0.0274						0		30	
1,3-Dichloropropane	ND	0.0457						0		30	
Tetrachloroethene (PCE)	ND	0.0183						0		30	
Dibromochloromethane	ND	0.0274						0		30	
1,2-Dibromoethane (EDB)	ND	0.00457						0		30	
Chlorobenzene	ND	0.0183						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0274						0		30	
Ethylbenzene	ND	0.0274						0		30	
m,p-Xylene	ND	0.0183						0		30	
o-Xylene	ND	0.0183						0		30	
Styrene	ND	0.0183						0		30	
Isopropylbenzene	ND	0.0731						0		30	
Bromoform	ND	0.0183						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0183						0		30	
n-Propylbenzene	ND	0.0183						0		30	
Bromobenzene	ND	0.0274						0		30	
1,3,5-Trimethylbenzene	ND	0.0183						0		30	
2-Chlorotoluene	ND	0.0183						0		30	
4-Chlorotoluene	ND	0.0183						0		30	
tert-Butylbenzene	ND	0.0183						0		30	
1,2,3-Trichloropropane	ND	0.0183						0		30	
1,2,4-Trichlorobenzene	ND	0.0457						0		30	

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610007-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: BATCH	Batch ID: 15016		Analysis Date: 10/4/2016	SeqNo: 607470							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

sec-Butylbenzene	ND	0.0183						0		30	
4-Isopropyltoluene	ND	0.0183						0		30	
1,3-Dichlorobenzene	ND	0.0183						0		30	
1,4-Dichlorobenzene	ND	0.0183						0		30	
n-Butylbenzene	ND	0.0183						0		30	
1,2-Dichlorobenzene	ND	0.0183						0		30	
1,2-Dibromo-3-chloropropane	ND	0.457						0		30	
1,2,4-Trimethylbenzene	ND	0.0183						0		30	
Hexachlorobutadiene	ND	0.0913						0		30	
Naphthalene	ND	0.0274						0		30	
1,2,3-Trichlorobenzene	ND	0.0183						0		30	
Surr: Dibromofluoromethane	1.09		1.141		95.2	56.5	129		0		
Surr: Toluene-d8	1.18		1.141		103	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.12		1.141		98.1	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610034-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: W9-SP-25	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607475							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.661	0.0670	1.117	0	59.2	43.5	121				Q
Chloromethane	1.17	0.0670	1.117	0	105	45	130				
Vinyl chloride	1.03	0.00223	1.117	0	92.5	51.2	146				
Bromomethane	0.962	0.101	1.117	0	86.1	21.3	120				
Trichlorofluoromethane (CFC-11)	0.648	0.0558	1.117	0	58.0	35	131				
Chloroethane	0.782	0.0670	1.117	0	70.0	43.8	117				
1,1-Dichloroethene	1.15	0.0558	1.117	0	103	61.9	141				
Methylene chloride	1.24	0.0223	1.117	0	111	54.7	142				
trans-1,2-Dichloroethene	1.20	0.0223	1.117	0	107	52	136				
Methyl tert-butyl ether (MTBE)	1.20	0.0558	1.117	0	108	54.4	132				

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610034-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: W9-SP-25	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607475							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethane	1.18	0.0223	1.117	0	105	51.8	141				
2,2-Dichloropropane	1.25	0.0558	1.117	0	112	36	123				Q
cis-1,2-Dichloroethene	1.25	0.0223	1.117	0	112	58.6	136				
Chloroform	1.16	0.0223	1.117	0	104	53.2	129				
1,1,1-Trichloroethane (TCA)	1.14	0.0223	1.117	0	102	58.3	145				
1,1-Dichloropropene	1.21	0.0223	1.117	0	109	55.1	138				
Carbon tetrachloride	1.24	0.0223	1.117	0	111	53.3	144				
1,2-Dichloroethane (EDC)	1.17	0.0335	1.117	0	104	51.3	139				
Benzene	1.25	0.0223	1.117	0	112	63.5	133				
Trichloroethene (TCE)	1.19	0.0223	1.117	0	107	68.6	132				
1,2-Dichloropropane	1.24	0.0223	1.117	0	111	59	136				
Bromodichloromethane	1.06	0.0223	1.117	0	94.8	50.7	141				
Dibromomethane	1.17	0.0447	1.117	0	105	50.6	137				
cis-1,3-Dichloropropene	1.14	0.0223	1.117	0	103	50.4	138				
Toluene	1.29	0.0223	1.117	0	115	63.4	132				
trans-1,3-Dichloropropylene	1.17	0.0335	1.117	0	104	44.1	147				
1,1,2-Trichloroethane	1.19	0.0335	1.117	0	106	51.6	137				
1,3-Dichloropropane	1.21	0.0558	1.117	0	108	53.1	134				
Tetrachloroethene (PCE)	1.24	0.0223	1.117	0	111	35.6	158				
Dibromochloromethane	1.06	0.0335	1.117	0	94.6	55.3	140				
1,2-Dibromoethane (EDB)	1.17	0.00558	1.117	0	105	50.4	136				
Chlorobenzene	1.23	0.0223	1.117	0	110	60	133				
1,1,1,2-Tetrachloroethane	1.12	0.0335	1.117	0	100	53.1	142				
Ethylbenzene	1.22	0.0335	1.117	0.01340	108	54.5	134				
m,p-Xylene	2.45	0.0223	2.234	0.02681	108	53.1	132				
o-Xylene	1.24	0.0223	1.117	0	111	53.3	139				
Styrene	1.24	0.0223	1.117	0	111	51.1	132				
Isopropylbenzene	1.28	0.0894	1.117	0.02178	112	58.9	138				
Bromoform	0.975	0.0223	1.117	0	87.3	57.9	130				
1,1,1,2,2-Tetrachloroethane	1.14	0.0223	1.117	0	102	51.9	131				
n-Propylbenzene	1.31	0.0223	1.117	0.04021	114	53.6	140				

Work Order: 1610034
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610034-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: W9-SP-25	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607475							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromobenzene	1.25	0.0335	1.117	0	112	54.2	140				
1,3,5-Trimethylbenzene	1.31	0.0223	1.117	0.03239	114	51.8	136				
2-Chlorotoluene	1.23	0.0223	1.117	0	110	51.6	136				
4-Chlorotoluene	1.24	0.0223	1.117	0	111	50.1	139				
tert-Butylbenzene	1.29	0.0223	1.117	0	115	50.5	135				
1,2,3-Trichloropropane	1.14	0.0223	1.117	0	102	50.5	131				
1,2,4-Trichlorobenzene	1.32	0.0558	1.117	0	118	50.8	130				
sec-Butylbenzene	1.35	0.0223	1.117	0.04691	117	52.6	141				
4-Isopropyltoluene	1.39	0.0223	1.117	0.04412	120	52.9	134				
1,3-Dichlorobenzene	1.25	0.0223	1.117	0	112	52.6	131				
1,4-Dichlorobenzene	1.21	0.0223	1.117	0	108	52.9	129				
n-Butylbenzene	1.49	0.0223	1.117	0.08489	126	52.6	130				
1,2-Dichlorobenzene	1.24	0.0223	1.117	0	111	55.8	129				
1,2-Dibromo-3-chloropropane	0.981	0.558	1.117	0	87.8	40.5	131				
1,2,4-Trimethylbenzene	1.44	0.0223	1.117	0.1312	117	50.6	137				
Hexachlorobutadiene	1.48	0.112	1.117	0	133	40.6	158				
Naphthalene	1.45	0.0335	1.117	0.1273	118	52.3	124				
1,2,3-Trichlorobenzene	1.29	0.0223	1.117	0	116	54.4	124				
Surr: Dibromofluoromethane	1.39		1.396		99.3	56.5	129				
Surr: Toluene-d8	1.44		1.396		103	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.46		1.396		105	63.1	141				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610034-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130							
Client ID: W9-SP-25	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607476							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.606	0.0670	1.117	0	54.2	43.5	121	0.6607	8.64	30	Q
Chloromethane	1.13	0.0670	1.117	0	101	45	130	1.173	3.73	30	
Vinyl chloride	0.979	0.00223	1.117	0	87.7	51.2	146	1.033	5.38	30	

Work Order: 1610034
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610034-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130
Client ID: W9-SP-25	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607476

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromomethane	0.910	0.101	1.117	0	81.4	21.3	120	0.9617	5.55	30	
Trichlorofluoromethane (CFC-11)	0.547	0.0558	1.117	0	49.0	35	131	0.6478	16.8	30	
Chloroethane	0.717	0.0670	1.117	0	64.2	43.8	117	0.7824	8.72	30	
1,1-Dichloroethene	1.07	0.0558	1.117	0	96.0	61.9	141	1.145	6.65	30	
Methylene chloride	1.16	0.0223	1.117	0	104	54.7	142	1.239	6.47	30	
trans-1,2-Dichloroethene	1.13	0.0223	1.117	0	102	52	136	1.197	5.37	30	
Methyl tert-butyl ether (MTBE)	1.23	0.0558	1.117	0	110	54.4	132	1.205	1.88	30	
1,1-Dichloroethane	1.13	0.0223	1.117	0	101	51.8	141	1.175	3.78	30	
2,2-Dichloropropane	1.22	0.0558	1.117	0	109	36	123	1.246	2.13	30	Q
cis-1,2-Dichloroethene	1.20	0.0223	1.117	0	107	58.6	136	1.248	4.25	30	
Chloroform	1.11	0.0223	1.117	0	99.5	53.2	129	1.164	4.66	30	
1,1,1-Trichloroethane (TCA)	1.08	0.0223	1.117	0	96.7	58.3	145	1.138	5.19	30	
1,1-Dichloropropene	1.19	0.0223	1.117	0	106	55.1	138	1.214	2.05	30	
Carbon tetrachloride	1.10	0.0223	1.117	0	98.5	53.3	144	1.240	12.0	30	
1,2-Dichloroethane (EDC)	1.13	0.0335	1.117	0	101	51.3	139	1.166	3.51	30	
Benzene	1.18	0.0223	1.117	0	106	63.5	133	1.246	5.06	30	
Trichloroethene (TCE)	1.15	0.0223	1.117	0	103	68.6	132	1.193	3.82	30	
1,2-Dichloropropane	1.20	0.0223	1.117	0	108	59	136	1.239	3.07	30	
Bromodichloromethane	1.02	0.0223	1.117	0	91.2	50.7	141	1.059	3.92	30	
Dibromomethane	1.14	0.0447	1.117	0	102	50.6	137	1.168	2.76	30	
cis-1,3-Dichloropropene	1.14	0.0223	1.117	0	102	50.4	138	1.145	0.587	30	
Toluene	1.25	0.0223	1.117	0	112	63.4	132	1.288	3.39	30	
trans-1,3-Dichloropropylene	1.17	0.0335	1.117	0	105	44.1	147	1.166	0.573	30	
1,1,2-Trichloroethane	1.16	0.0335	1.117	0	104	51.6	137	1.188	2.43	30	
1,3-Dichloropropane	1.19	0.0558	1.117	0	107	53.1	134	1.205	1.07	30	
Tetrachloroethene (PCE)	1.18	0.0223	1.117	0	106	35.6	158	1.242	4.79	30	
Dibromochloromethane	1.04	0.0335	1.117	0	92.9	55.3	140	1.057	1.87	30	
1,2-Dibromoethane (EDB)	1.15	0.00558	1.117	0	103	50.4	136	1.172	2.07	30	
Chlorobenzene	1.17	0.0223	1.117	0	105	60	133	1.231	4.97	30	
1,1,1,2-Tetrachloroethane	1.07	0.0335	1.117	0	95.6	53.1	142	1.116	4.45	30	
Ethylbenzene	1.16	0.0335	1.117	0.01340	102	54.5	134	1.221	5.40	30	

Work Order: 1610034
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610034-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/4/2016	RunNo: 32130
Client ID: W9-SP-25	Batch ID: 15016		Analysis Date: 10/5/2016	SeqNo: 607476

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
m,p-Xylene	2.33	0.0223	2.234	0.02681	103	53.1	132	2.451	5.12	30	
o-Xylene	1.18	0.0223	1.117	0	105	53.3	139	1.244	5.63	30	
Styrene	1.18	0.0223	1.117	0	106	51.1	132	1.240	4.79	30	
Isopropylbenzene	1.21	0.0894	1.117	0.02178	107	58.9	138	1.278	5.25	30	
Bromoform	0.967	0.0223	1.117	0	86.6	57.9	130	0.9751	0.863	30	
1,1,2,2-Tetrachloroethane	1.12	0.0223	1.117	0	99.9	51.9	131	1.136	1.79	30	
n-Propylbenzene	1.24	0.0223	1.117	0.04021	108	53.6	140	1.314	5.73	30	
Bromobenzene	1.20	0.0335	1.117	0	108	54.2	140	1.248	3.78	30	
1,3,5-Trimethylbenzene	1.25	0.0223	1.117	0.03239	109	51.8	136	1.309	4.36	30	
2-Chlorotoluene	1.17	0.0223	1.117	0	105	51.6	136	1.225	4.52	30	
4-Chlorotoluene	1.18	0.0223	1.117	0	106	50.1	139	1.238	4.95	30	
tert-Butylbenzene	1.23	0.0223	1.117	0	110	50.5	135	1.290	4.79	30	
1,2,3-Trichloropropane	1.12	0.0223	1.117	0	100	50.5	131	1.143	2.12	30	
1,2,4-Trichlorobenzene	1.32	0.0558	1.117	0	118	50.8	130	1.321	0.296	30	
sec-Butylbenzene	1.28	0.0223	1.117	0.04691	110	52.6	141	1.352	5.56	30	
4-Isopropyltoluene	1.32	0.0223	1.117	0.04412	114	52.9	134	1.386	5.08	30	
1,3-Dichlorobenzene	1.23	0.0223	1.117	0	110	52.6	131	1.249	1.81	30	
1,4-Dichlorobenzene	1.20	0.0223	1.117	0	107	52.9	129	1.207	0.883	30	
n-Butylbenzene	1.44	0.0223	1.117	0.08489	121	52.6	130	1.490	3.43	30	
1,2-Dichlorobenzene	1.23	0.0223	1.117	0	110	55.8	129	1.244	0.811	30	
1,2-Dibromo-3-chloropropane	1.04	0.558	1.117	0	93.4	40.5	131	0.9807	6.13	30	
1,2,4-Trimethylbenzene	1.39	0.0223	1.117	0.1312	112	50.6	137	1.438	3.68	30	
Hexachlorobutadiene	1.44	0.112	1.117	0	129	40.6	158	1.482	2.98	30	
Naphthalene	1.47	0.0335	1.117	0.1273	120	52.3	124	1.446	1.34	30	
1,2,3-Trichlorobenzene	1.28	0.0223	1.117	0	114	54.4	124	1.295	1.35	30	
Surr: Dibromofluoromethane	1.37		1.396		97.8	56.5	129		0		
Surr: Toluene-d8	1.44		1.396		103	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.45		1.396		104	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Client Name: GEI	Work Order Number: 1610034
Logged by: Erica Silva	Date Received: 10/4/2016 12:05:00 PM

Chain of Custody

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

Log In

3. Coolers are present? Yes No NA

Sample received straight from field

4. Shipping container/cooler in good condition? Yes No
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes No Not Required
6. Was an attempt made to cool the samples? Yes No NA
7. Were all items received at a temperature of >0°C to 10.0°C* Yes No NA
8. Sample(s) in proper container(s)? Yes No
9. Sufficient sample volume for indicated test(s)? Yes No
10. Are samples properly preserved? Yes No
11. Was preservative added to bottles? Yes No NA
MeOH to 001B
12. Is there headspace in the VOA vials? Yes No NA
13. Did all samples containers arrive in good condition(unbroken)? Yes No
14. Does paperwork match bottle labels? Yes No
15. Are matrices correctly identified on Chain of Custody? Yes No
16. Is it clear what analyses were requested? Yes No
17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Sample	18.8

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



Fremont

3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record and Laboratory Services Agreement

Date: 10-4-16

Laboratory Project No (Internal): 1610034

Page: 1 of 1

Client: Geoengeers

Project Name: Rufus Block 20

Project No: 2064-002-01

Collected by: Sydney Branson

Address: 1600 Stewart St, Suite 121

Location: Seattle, WA

City, State, zip: Seattle, WA

Report To (PM): Chris Brown

Telephone: _____

PM Email: _____

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

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Analytes													Comments	
				VOCS (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)		
1 WA-SF-25	10/4/16	1130	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2 # Bottles
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

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

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite Turn-around times for samples received after 4:00pm will begin on the following business day.

Sample Disposal: Return to Client Disposal by Lab (Samples will be held for 30 days unless otherwise noted. A fee may be assessed if samples are retained after 30 days.)

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

Relinquished Signature Date/Time 10/4/16 12:05 Received Signature Date/Time 10/4/16 12:05

Relinquished X Received X

Special Remarks: TAT as soon as possible.

TAT → Same Day Next Day 2 Day 3 Day STD

*Please coordinate with the lab in advance



Fremont

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

Chain of Custody Record and Laboratory Services Agreement

Client: GeoEngineers
Address: 1600 Stewart St Suite 121
City, State, zip: Seattle, WA
Telephone: _____ Fax: _____

Date: 12-4-16
Project Name: Rufus Block 20
Project No: 2064-002-01
Location: Seattle, WA
Report To (PM): Chris Brown
PM Email: cbrown@geosinc.com

Laboratory Project No (Internal): 1610034
Page: 1 of 1

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water										Comments				
				VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCDI)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)		Total (T) Dissolved (D)	Anions (IC)**	EDB (8011)	Hex/Ch
1 WA-SF-25	12/4/16	11:30	S	X	X	X	X	X	X	X	X	X	X	X	X	X	2 BOTTLES	2 BOTTLES FOR CB 12/5/16 of SA
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

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

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

Sample Disposal: Return to Client Disposal by Lab (Samples will be held for 30 days unless otherwise noted. A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

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

Special Remarks: TAT as soon as possible.

Relinquished Date/Time: 12/4/16 Received Date/Time: 12/5

Relinquished Date/Time: 12/4/16 Received Date/Time: 12/4/16

TAT → SameDay NextDay 2 Day 3 Day STD

*Please coordinate with the lab in advance



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

GeoEngineers

Chris Brown
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Rufus Block 20
Work Order Number: 1610174

October 13, 2016

Attention Chris Brown:

Fremont Analytical, Inc. received 11 sample(s) on 10/12/2016 for the analyses presented in the following report.

- Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.***
- Gasoline by NWTPH-Gx***
- Mercury by EPA Method 7471***
- Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)***
- Sample Moisture (Percent Moisture)***
- Total Metals by EPA Method 6020***
- Volatile Organic Compounds by EPA Method 8260C***

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Original

www.fremontanalytical.com



Date: 10/13/2016

CLIENT: GeoEngineers
Project: Rufus Block 20
Work Order: 1610174

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1610174-001	W6-15	10/10/2016 8:02 AM	10/12/2016 8:55 AM
1610174-002	W6-25	10/10/2016 8:08 AM	10/12/2016 8:55 AM
1610174-003	W6-35	10/10/2016 8:35 AM	10/12/2016 8:55 AM
1610174-004	W6-45	10/10/2016 8:43 AM	10/12/2016 8:55 AM
1610174-005	W6-60	10/10/2016 9:10 AM	10/12/2016 8:55 AM
1610174-006	W10-15	10/07/2016 4:22 PM	10/12/2016 8:55 AM
1610174-007	W10-25	10/07/2016 4:27 PM	10/12/2016 8:55 AM
1610174-008	W10-35	10/07/2016 4:33 PM	10/12/2016 8:55 AM
1610174-009	W10-45	10/07/2016 4:36 PM	10/12/2016 8:55 AM
1610174-010	W10-60	10/07/2016 4:48 PM	10/12/2016 8:55 AM
1610174-011	Trip Blank	10/07/2016 10:07 AM	10/12/2016 8:55 AM

CLIENT: GeoEngineers

Project: Rufus Block 20

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-001
Client Sample ID: W6-15

Collection Date: 10/10/2016 8:02:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15107 Analyst: WC

Diesel (Fuel Oil)	ND	23.0		mg/Kg-dry	1	10/13/2016 5:11:00 AM
Heavy Oil	ND	57.5		mg/Kg-dry	1	10/13/2016 5:11:00 AM
Surr: 2-Fluorobiphenyl	97.1	50-150		%Rec	1	10/13/2016 5:11:00 AM
Surr: o-Terphenyl	97.5	50-150		%Rec	1	10/13/2016 5:11:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15106 Analyst: BT

Naphthalene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
2-Methylnaphthalene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
1-Methylnaphthalene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Acenaphthylene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Acenaphthene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Fluorene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Phenanthrene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Anthracene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Fluoranthene	53.1	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Pyrene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Benz(a)anthracene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Chrysene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Benzo(b)fluoranthene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Benzo(k)fluoranthene	ND	46.4	Q	µg/Kg-dry	1	10/13/2016 4:04:55 PM
Benzo(a)pyrene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Indeno(1,2,3-cd)pyrene	ND	46.4	Q	µg/Kg-dry	1	10/13/2016 4:04:55 PM
Dibenz(a,h)anthracene	ND	46.4	Q	µg/Kg-dry	1	10/13/2016 4:04:55 PM
Benzo(g,h,i)perylene	ND	46.4		µg/Kg-dry	1	10/13/2016 4:04:55 PM
Surr: 2-Fluorobiphenyl	59.0	32.2-123		%Rec	1	10/13/2016 4:04:55 PM
Surr: Terphenyl-d14 (surr)	72.0	42.2-152		%Rec	1	10/13/2016 4:04:55 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Gasoline by NWTPH-Gx

Batch ID: 15111 Analyst: NG

Gasoline	ND	2.41		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Surr: Toluene-d8	101	65-135		%Rec	1	10/13/2016 7:41:00 AM
Surr: 4-Bromofluorobenzene	97.6	65-135		%Rec	1	10/13/2016 7:41:00 AM

Original



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-001
Client Sample ID: W6-15

Collection Date: 10/10/2016 8:02:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260C					Batch ID: 15111	Analyst: NG
Dichlorodifluoromethane (CFC-12)	ND	0.0290		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Chloromethane	ND	0.0290		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Vinyl chloride	ND	0.000965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Bromomethane	ND	0.0434		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0241		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Chloroethane	ND	0.0290		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,1-Dichloroethene	ND	0.0241		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Methylene chloride	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
trans-1,2-Dichloroethene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0241		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,1-Dichloroethane	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
2,2-Dichloropropane	ND	0.0241	Q	mg/Kg-dry	1	10/13/2016 7:41:00 AM
cis-1,2-Dichloroethene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Chloroform	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,1-Dichloropropene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Carbon tetrachloride	ND	0.00965	Q	mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2-Dichloroethane (EDC)	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Benzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Trichloroethene (TCE)	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2-Dichloropropane	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Bromodichloromethane	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Dibromomethane	ND	0.0193		mg/Kg-dry	1	10/13/2016 7:41:00 AM
cis-1,3-Dichloropropene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Toluene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
trans-1,3-Dichloropropylene	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,1,2-Trichloroethane	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,3-Dichloropropane	ND	0.0241		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Tetrachloroethene (PCE)	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Dibromochloromethane	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2-Dibromoethane (EDB)	ND	0.00241		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Chlorobenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Ethylbenzene	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
m,p-Xylene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
o-Xylene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Styrene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Isopropylbenzene	ND	0.0386		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Bromoform	ND	0.00965	Q	mg/Kg-dry	1	10/13/2016 7:41:00 AM

Original



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-001
Client Sample ID: W6-15

Collection Date: 10/10/2016 8:02:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111 Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
n-Propylbenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Bromobenzene	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,3,5-Trimethylbenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
2-Chlorotoluene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
4-Chlorotoluene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
tert-Butylbenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2,3-Trichloropropane	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2,4-Trichlorobenzene	ND	0.0241		mg/Kg-dry	1	10/13/2016 7:41:00 AM
sec-Butylbenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
4-Isopropyltoluene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,3-Dichlorobenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,4-Dichlorobenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
n-Butylbenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2-Dichlorobenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2-Dibromo-3-chloropropane	ND	0.241		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2,4-Trimethylbenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Hexachlorobutadiene	ND	0.0483		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Naphthalene	ND	0.0145		mg/Kg-dry	1	10/13/2016 7:41:00 AM
1,2,3-Trichlorobenzene	ND	0.00965		mg/Kg-dry	1	10/13/2016 7:41:00 AM
Surr: Dibromofluoromethane	91.6	56.5-129		%Rec	1	10/13/2016 7:41:00 AM
Surr: Toluene-d8	100	64.3-131		%Rec	1	10/13/2016 7:41:00 AM
Surr: 1-Bromo-4-fluorobenzene	93.3	63.1-141		%Rec	1	10/13/2016 7:41:00 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15120 Analyst: MW

Mercury	ND	0.300		mg/Kg-dry	1	10/13/2016 2:52:55 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15108 Analyst: TN

Arsenic	5.10	0.0899		mg/Kg-dry	1	10/13/2016 1:11:11 PM
Barium	84.3	0.450		mg/Kg-dry	1	10/13/2016 1:11:11 PM
Cadmium	ND	0.180		mg/Kg-dry	1	10/13/2016 1:11:11 PM
Chromium	35.8	0.0899		mg/Kg-dry	1	10/13/2016 1:11:11 PM
Lead	9.04	0.180		mg/Kg-dry	1	10/13/2016 1:11:11 PM
Selenium	1.38	0.450		mg/Kg-dry	1	10/13/2016 1:11:11 PM

Original



Analytical Report

Work Order: 1610174
 Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-001
Client Sample ID: W6-15

Collection Date: 10/10/2016 8:02:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Total Metals by EPA Method 6020</u>				Batch ID: 15108		Analyst: TN
Silver	ND	0.0899		mg/Kg-dry	1	10/13/2016 1:11:11 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R32275		Analyst: BB
Percent Moisture	18.2			wt%	1	10/12/2016 2:44:20 PM



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-002
Client Sample ID: W6-25

Collection Date: 10/10/2016 8:08:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15107 Analyst: WC

Diesel (Fuel Oil)	ND	23.0		mg/Kg-dry	1	10/13/2016 5:42:00 AM
Heavy Oil	ND	57.6		mg/Kg-dry	1	10/13/2016 5:42:00 AM
Surr: 2-Fluorobiphenyl	103	50-150		%Rec	1	10/13/2016 5:42:00 AM
Surr: o-Terphenyl	102	50-150		%Rec	1	10/13/2016 5:42:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15106 Analyst: BT

Naphthalene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
2-Methylnaphthalene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
1-Methylnaphthalene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Acenaphthylene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Acenaphthene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Fluorene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Phenanthrene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Anthracene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Fluoranthene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Pyrene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Benz(a)anthracene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Chrysene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Benzo(b)fluoranthene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Benzo(k)fluoranthene	ND	45.2	Q	µg/Kg-dry	1	10/13/2016 4:39:50 PM
Benzo(a)pyrene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Indeno(1,2,3-cd)pyrene	ND	45.2	Q	µg/Kg-dry	1	10/13/2016 4:39:50 PM
Dibenz(a,h)anthracene	ND	45.2	Q	µg/Kg-dry	1	10/13/2016 4:39:50 PM
Benzo(g,h,i)perylene	ND	45.2		µg/Kg-dry	1	10/13/2016 4:39:50 PM
Surr: 2-Fluorobiphenyl	68.6	32.2-123		%Rec	1	10/13/2016 4:39:50 PM
Surr: Terphenyl-d14 (surr)	77.5	42.2-152		%Rec	1	10/13/2016 4:39:50 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Gasoline by NWTPH-Gx

Batch ID: 15111 Analyst: NG

Gasoline	ND	1.51		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Surr: Toluene-d8	101	65-135		%Rec	1	10/13/2016 8:11:18 AM
Surr: 4-Bromofluorobenzene	94.6	65-135		%Rec	1	10/13/2016 8:11:18 AM



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-002
Client Sample ID: W6-25

Collection Date: 10/10/2016 8:08:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260C					Batch ID: 15111	Analyst: NG
Dichlorodifluoromethane (CFC-12)	ND	0.0181		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Chloromethane	ND	0.0181		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Vinyl chloride	ND	0.000602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Bromomethane	ND	0.0271		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Trichlorofluoromethane (CFC-11)	ND	0.0151		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Chloroethane	ND	0.0181		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,1-Dichloroethene	ND	0.0151		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Methylene chloride	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
trans-1,2-Dichloroethene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Methyl tert-butyl ether (MTBE)	ND	0.0151		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,1-Dichloroethane	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
2,2-Dichloropropane	ND	0.0151	Q	mg/Kg-dry	1	10/13/2016 8:11:18 AM
cis-1,2-Dichloroethene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Chloroform	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,1,1-Trichloroethane (TCA)	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,1-Dichloropropene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Carbon tetrachloride	ND	0.00602	Q	mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2-Dichloroethane (EDC)	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Benzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Trichloroethene (TCE)	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2-Dichloropropane	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Bromodichloromethane	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Dibromomethane	ND	0.0120		mg/Kg-dry	1	10/13/2016 8:11:18 AM
cis-1,3-Dichloropropene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Toluene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
trans-1,3-Dichloropropylene	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,1,2-Trichloroethane	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,3-Dichloropropane	ND	0.0151		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Tetrachloroethene (PCE)	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Dibromochloromethane	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2-Dibromoethane (EDB)	ND	0.00151		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Chlorobenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,1,1,2-Tetrachloroethane	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Ethylbenzene	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
m,p-Xylene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
o-Xylene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Styrene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Isopropylbenzene	ND	0.0241		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Bromoform	ND	0.00602	Q	mg/Kg-dry	1	10/13/2016 8:11:18 AM

Original



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-002
Client Sample ID: W6-25

Collection Date: 10/10/2016 8:08:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111 Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
n-Propylbenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Bromobenzene	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,3,5-Trimethylbenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
2-Chlorotoluene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
4-Chlorotoluene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
tert-Butylbenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2,3-Trichloropropane	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2,4-Trichlorobenzene	ND	0.0151		mg/Kg-dry	1	10/13/2016 8:11:18 AM
sec-Butylbenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
4-Isopropyltoluene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,3-Dichlorobenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,4-Dichlorobenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
n-Butylbenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2-Dichlorobenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2-Dibromo-3-chloropropane	ND	0.151		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2,4-Trimethylbenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Hexachlorobutadiene	ND	0.0301		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Naphthalene	ND	0.00904		mg/Kg-dry	1	10/13/2016 8:11:18 AM
1,2,3-Trichlorobenzene	ND	0.00602		mg/Kg-dry	1	10/13/2016 8:11:18 AM
Surr: Dibromofluoromethane	92.3	56.5-129		%Rec	1	10/13/2016 8:11:18 AM
Surr: Toluene-d8	102	64.3-131		%Rec	1	10/13/2016 8:11:18 AM
Surr: 1-Bromo-4-fluorobenzene	93.5	63.1-141		%Rec	1	10/13/2016 8:11:18 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15120 Analyst: MW

Mercury	ND	0.298		mg/Kg-dry	1	10/13/2016 2:54:31 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15108 Analyst: TN

Arsenic	3.73	0.0964		mg/Kg-dry	1	10/13/2016 1:32:24 PM
Barium	108	0.482		mg/Kg-dry	1	10/13/2016 1:32:24 PM
Cadmium	ND	0.193		mg/Kg-dry	1	10/13/2016 1:32:24 PM
Chromium	51.7	0.0964		mg/Kg-dry	1	10/13/2016 1:32:24 PM
Lead	4.13	0.193		mg/Kg-dry	1	10/13/2016 1:32:24 PM
Selenium	1.69	0.482		mg/Kg-dry	1	10/13/2016 1:32:24 PM

Original



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-002
Client Sample ID: W6-25

Collection Date: 10/10/2016 8:08:00 AM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Total Metals by EPA Method 6020</u>				Batch ID: 15108		Analyst: TN
Silver	ND	0.0964		mg/Kg-dry	1	10/13/2016 1:32:24 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R32275		Analyst: BB
Percent Moisture	17.7			wt%	1	10/12/2016 2:44:20 PM



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-007
Client Sample ID: W10-25

Collection Date: 10/7/2016 4:27:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15107 Analyst: WC

Diesel (Fuel Oil)	ND	23.4		mg/Kg-dry	1	10/13/2016 6:13:00 AM
Heavy Oil	ND	58.4		mg/Kg-dry	1	10/13/2016 6:13:00 AM
Surr: 2-Fluorobiphenyl	85.4	50-150		%Rec	1	10/13/2016 6:13:00 AM
Surr: o-Terphenyl	88.0	50-150		%Rec	1	10/13/2016 6:13:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15106 Analyst: BT

Naphthalene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
2-Methylnaphthalene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
1-Methylnaphthalene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Acenaphthylene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Acenaphthene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Fluorene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Phenanthrene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Anthracene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Fluoranthene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Pyrene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Benz(a)anthracene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Chrysene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Benzo(b)fluoranthene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Benzo(k)fluoranthene	ND	44.7	Q	µg/Kg-dry	1	10/13/2016 5:00:59 PM
Benzo(a)pyrene	ND	44.7		µg/Kg-dry	1	10/13/2016 5:00:59 PM
Indeno(1,2,3-cd)pyrene	ND	44.7	IQ	µg/Kg-dry	1	10/13/2016 5:00:59 PM
Dibenz(a,h)anthracene	ND	44.7	IQ	µg/Kg-dry	1	10/13/2016 5:00:59 PM
Benzo(g,h,i)perylene	ND	44.7	I	µg/Kg-dry	1	10/13/2016 5:00:59 PM
Surr: 2-Fluorobiphenyl	77.4	32.2-123		%Rec	1	10/13/2016 5:00:59 PM
Surr: Terphenyl-d14 (surr)	84.9	42.2-152		%Rec	1	10/13/2016 5:00:59 PM

NOTES:

I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Gasoline by NWTPH-Gx

Batch ID: 15111 Analyst: NG

Gasoline	ND	1.62		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Surr: Toluene-d8	101	65-135		%Rec	1	10/13/2016 8:41:40 AM
Surr: 4-Bromofluorobenzene	95.5	65-135		%Rec	1	10/13/2016 8:41:40 AM



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers

Collection Date: 10/7/2016 4:27:00 PM

Project: Rufus Block 20

Lab ID: 1610174-007

Matrix: Soil

Client Sample ID: W10-25

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260C					Batch ID: 15111	Analyst: NG
Dichlorodifluoromethane (CFC-12)	ND	0.0194		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Chloromethane	ND	0.0194		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Vinyl chloride	ND	0.000646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Bromomethane	ND	0.0291		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Trichlorofluoromethane (CFC-11)	ND	0.0162		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Chloroethane	ND	0.0194		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,1-Dichloroethene	ND	0.0162		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Methylene chloride	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
trans-1,2-Dichloroethene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Methyl tert-butyl ether (MTBE)	ND	0.0162		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,1-Dichloroethane	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
2,2-Dichloropropane	ND	0.0162	Q	mg/Kg-dry	1	10/13/2016 8:41:40 AM
cis-1,2-Dichloroethene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Chloroform	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,1,1-Trichloroethane (TCA)	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,1-Dichloropropene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Carbon tetrachloride	ND	0.00646	Q	mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2-Dichloroethane (EDC)	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Benzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Trichloroethene (TCE)	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2-Dichloropropane	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Bromodichloromethane	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Dibromomethane	ND	0.0129		mg/Kg-dry	1	10/13/2016 8:41:40 AM
cis-1,3-Dichloropropene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Toluene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
trans-1,3-Dichloropropylene	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,1,2-Trichloroethane	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,3-Dichloropropane	ND	0.0162		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Tetrachloroethene (PCE)	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Dibromochloromethane	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2-Dibromoethane (EDB)	ND	0.00162		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Chlorobenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,1,1,2-Tetrachloroethane	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Ethylbenzene	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
m,p-Xylene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
o-Xylene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Styrene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Isopropylbenzene	ND	0.0259		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Bromoform	ND	0.00646	Q	mg/Kg-dry	1	10/13/2016 8:41:40 AM

Original



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-007
Client Sample ID: W10-25

Collection Date: 10/7/2016 4:27:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111 Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
n-Propylbenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Bromobenzene	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,3,5-Trimethylbenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
2-Chlorotoluene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
4-Chlorotoluene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
tert-Butylbenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2,3-Trichloropropane	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2,4-Trichlorobenzene	ND	0.0162		mg/Kg-dry	1	10/13/2016 8:41:40 AM
sec-Butylbenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
4-Isopropyltoluene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,3-Dichlorobenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,4-Dichlorobenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
n-Butylbenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2-Dichlorobenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2-Dibromo-3-chloropropane	ND	0.162		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2,4-Trimethylbenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Hexachlorobutadiene	ND	0.0323		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Naphthalene	ND	0.00970		mg/Kg-dry	1	10/13/2016 8:41:40 AM
1,2,3-Trichlorobenzene	ND	0.00646		mg/Kg-dry	1	10/13/2016 8:41:40 AM
Surr: Dibromofluoromethane	90.6	56.5-129		%Rec	1	10/13/2016 8:41:40 AM
Surr: Toluene-d8	101	64.3-131		%Rec	1	10/13/2016 8:41:40 AM
Surr: 1-Bromo-4-fluorobenzene	91.8	63.1-141		%Rec	1	10/13/2016 8:41:40 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15120 Analyst: MW

Mercury	ND	0.276		mg/Kg-dry	1	10/13/2016 2:59:29 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15108 Analyst: TN

Arsenic	5.43	0.0914		mg/Kg-dry	1	10/13/2016 1:35:56 PM
Barium	100	0.457		mg/Kg-dry	1	10/13/2016 1:35:56 PM
Cadmium	ND	0.183		mg/Kg-dry	1	10/13/2016 1:35:56 PM
Chromium	50.9	0.0914		mg/Kg-dry	1	10/13/2016 1:35:56 PM
Lead	4.47	0.183		mg/Kg-dry	1	10/13/2016 1:35:56 PM
Selenium	1.86	0.457		mg/Kg-dry	1	10/13/2016 1:35:56 PM

Original



Analytical Report

Work Order: 1610174
 Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-007
Client Sample ID: W10-25

Collection Date: 10/7/2016 4:27:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Total Metals by EPA Method 6020</u>				Batch ID: 15108		Analyst: TN
Silver	ND	0.0914		mg/Kg-dry	1	10/13/2016 1:35:56 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R32275		Analyst: BB
Percent Moisture	14.6			wt%	1	10/12/2016 2:44:20 PM



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-009
Client Sample ID: W10-45

Collection Date: 10/7/2016 4:36:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15107 Analyst: WC

Diesel (Fuel Oil)	ND	20.8		mg/Kg-dry	1	10/13/2016 6:44:00 AM
Heavy Oil	ND	52.0		mg/Kg-dry	1	10/13/2016 6:44:00 AM
Surr: 2-Fluorobiphenyl	102	50-150		%Rec	1	10/13/2016 6:44:00 AM
Surr: o-Terphenyl	101	50-150		%Rec	1	10/13/2016 6:44:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15106 Analyst: BT

Naphthalene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
2-Methylnaphthalene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
1-Methylnaphthalene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Acenaphthylene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Acenaphthene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Fluorene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Phenanthrene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Anthracene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Fluoranthene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Pyrene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Benz(a)anthracene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Chrysene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Benzo(b)fluoranthene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Benzo(k)fluoranthene	ND	42.1	Q	µg/Kg-dry	1	10/13/2016 5:22:07 PM
Benzo(a)pyrene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Indeno(1,2,3-cd)pyrene	ND	42.1	Q	µg/Kg-dry	1	10/13/2016 5:22:07 PM
Dibenz(a,h)anthracene	ND	42.1	Q	µg/Kg-dry	1	10/13/2016 5:22:07 PM
Benzo(g,h,i)perylene	ND	42.1		µg/Kg-dry	1	10/13/2016 5:22:07 PM
Surr: 2-Fluorobiphenyl	59.4	32.2-123		%Rec	1	10/13/2016 5:22:07 PM
Surr: Terphenyl-d14 (surr)	78.5	42.2-152		%Rec	1	10/13/2016 5:22:07 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Gasoline by NWTPH-Gx

Batch ID: 15111 Analyst: NG

Gasoline	ND	2.79		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Surr: Toluene-d8	204	65-135	S	%Rec	1	10/13/2016 9:12:01 AM
Surr: 4-Bromofluorobenzene	195	65-135	S	%Rec	1	10/13/2016 9:12:01 AM

Original



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers

Collection Date: 10/7/2016 4:36:00 PM

Project: Rufus Block 20

Lab ID: 1610174-009

Matrix: Soil

Client Sample ID: W10-45

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260C					Batch ID: 15111	Analyst: NG
Dichlorodifluoromethane (CFC-12)	ND	0.0335		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Chloromethane	ND	0.0335		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Vinyl chloride	ND	0.00112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Bromomethane	ND	0.0502		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Trichlorofluoromethane (CFC-11)	ND	0.0279		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Chloroethane	ND	0.0335		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,1-Dichloroethene	ND	0.0279		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Methylene chloride	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
trans-1,2-Dichloroethene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Methyl tert-butyl ether (MTBE)	ND	0.0279		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,1-Dichloroethane	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
2,2-Dichloropropane	ND	0.0279	Q	mg/Kg-dry	1	10/13/2016 9:12:01 AM
cis-1,2-Dichloroethene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Chloroform	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,1,1-Trichloroethane (TCA)	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,1-Dichloropropene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Carbon tetrachloride	ND	0.0112	Q	mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2-Dichloroethane (EDC)	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Benzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Trichloroethene (TCE)	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2-Dichloropropane	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Bromodichloromethane	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Dibromomethane	ND	0.0223		mg/Kg-dry	1	10/13/2016 9:12:01 AM
cis-1,3-Dichloropropene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Toluene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
trans-1,3-Dichloropropylene	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,1,2-Trichloroethane	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,3-Dichloropropane	ND	0.0279		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Tetrachloroethene (PCE)	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Dibromochloromethane	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2-Dibromoethane (EDB)	ND	0.00279		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Chlorobenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,1,1,2-Tetrachloroethane	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Ethylbenzene	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
m,p-Xylene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
o-Xylene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Styrene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Isopropylbenzene	ND	0.0446		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Bromoform	ND	0.0112	Q	mg/Kg-dry	1	10/13/2016 9:12:01 AM

Original



Analytical Report

Work Order: 1610174
Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-009
Client Sample ID: W10-45

Collection Date: 10/7/2016 4:36:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111 Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
n-Propylbenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Bromobenzene	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,3,5-Trimethylbenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
2-Chlorotoluene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
4-Chlorotoluene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
tert-Butylbenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2,3-Trichloropropane	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2,4-Trichlorobenzene	ND	0.0279		mg/Kg-dry	1	10/13/2016 9:12:01 AM
sec-Butylbenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
4-Isopropyltoluene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,3-Dichlorobenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,4-Dichlorobenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
n-Butylbenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2-Dichlorobenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2-Dibromo-3-chloropropane	ND	0.279		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2,4-Trimethylbenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Hexachlorobutadiene	ND	0.0558		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Naphthalene	ND	0.0167		mg/Kg-dry	1	10/13/2016 9:12:01 AM
1,2,3-Trichlorobenzene	ND	0.0112		mg/Kg-dry	1	10/13/2016 9:12:01 AM
Surr: Dibromofluoromethane	90.6	56.5-129		%Rec	1	10/13/2016 9:12:01 AM
Surr: Toluene-d8	101	64.3-131		%Rec	1	10/13/2016 9:12:01 AM
Surr: 1-Bromo-4-fluorobenzene	97.6	63.1-141		%Rec	1	10/13/2016 9:12:01 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15120 Analyst: MW

Mercury	ND	0.260		mg/Kg-dry	1	10/13/2016 3:01:06 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15108 Analyst: TN

Arsenic	1.78	0.0821		mg/Kg-dry	1	10/13/2016 1:46:37 PM
Barium	32.0	0.411		mg/Kg-dry	1	10/13/2016 1:46:37 PM
Cadmium	ND	0.164		mg/Kg-dry	1	10/13/2016 1:46:37 PM
Chromium	30.8	0.0821		mg/Kg-dry	1	10/13/2016 1:46:37 PM
Lead	1.38	0.164		mg/Kg-dry	1	10/13/2016 1:46:37 PM
Selenium	0.835	0.411		mg/Kg-dry	1	10/13/2016 1:46:37 PM

Original



Analytical Report

Work Order: 1610174
 Date Reported: 10/13/2016

Client: GeoEngineers
Project: Rufus Block 20
Lab ID: 1610174-009
Client Sample ID: W10-45

Collection Date: 10/7/2016 4:36:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Total Metals by EPA Method 6020</u>				Batch ID: 15108		Analyst: TN
Silver	ND	0.0821		mg/Kg-dry	1	10/13/2016 1:46:37 PM
<u>Sample Moisture (Percent Moisture)</u>				Batch ID: R32275		Analyst: BB
Percent Moisture	5.58			wt%	1	10/12/2016 2:44:20 PM

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-15107	SampType: MBLK	Units: mg/Kg			Prep Date: 10/12/2016	RunNo: 32287					
Client ID: MBLKS	Batch ID: 15107				Analysis Date: 10/13/2016	SeqNo: 610595					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	19.5		20.00		97.6	50	150				
Surr: o-Terphenyl	19.1		20.00		95.5	50	150				

Sample ID LCS-15107	SampType: LCS	Units: mg/Kg			Prep Date: 10/12/2016	RunNo: 32287					
Client ID: LCSS	Batch ID: 15107				Analysis Date: 10/13/2016	SeqNo: 610594					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	483	20.0	500.0	0	96.7	65	135				
Surr: 2-Fluorobiphenyl	20.5		20.00		103	50	150				
Surr: o-Terphenyl	19.7		20.00		98.5	50	150				

Sample ID 1610175-003ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32287					
Client ID: BATCH	Batch ID: 15107				Analysis Date: 10/13/2016	SeqNo: 610582					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	24.6						0		30	
Heavy Oil	ND	61.6						0		30	
Surr: 2-Fluorobiphenyl	24.5		24.64		99.3	50	150		0		
Surr: o-Terphenyl	24.5		24.64		99.2	50	150		0		

Sample ID 1610175-003AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32287					
Client ID: BATCH	Batch ID: 15107				Analysis Date: 10/13/2016	SeqNo: 610583					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	573	23.8	595.0	0	96.4	65	135				
Surr: 2-Fluorobiphenyl	22.9		23.80		96.1	50	150				
Surr: o-Terphenyl	23.3		23.80		97.8	50	150				



Date: 10/13/2016

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1610175-003AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32287					
Client ID: BATCH	Batch ID: 15107				Analysis Date: 10/13/2016	SeqNo: 610583					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID 1610175-003AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32287					
Client ID: BATCH	Batch ID: 15107				Analysis Date: 10/13/2016	SeqNo: 610584					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	577	22.7	566.9	0	102	65	135	573.4	0.683	30	
Surr: 2-Fluorobiphenyl	24.0		22.68		106	50	150		0		
Surr: o-Terphenyl	23.6		22.68		104	50	150		0		

Sample ID 1610179-007ADUP	SampType: DUP	Units: mg/Kg			Prep Date: 10/12/2016	RunNo: 32287					
Client ID: BATCH	Batch ID: 15107				Analysis Date: 10/13/2016	SeqNo: 610826					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	19.3						0		30	
Heavy Oil	ND	48.3						0		30	
Surr: 2-Fluorobiphenyl	19.5		19.32		101	50	150		0		
Surr: o-Terphenyl	20.3		19.32		105	50	150		0		

Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID LCS-15111	SampType: LCS	Units: mg/Kg				Prep Date: 10/12/2016	RunNo: 32293				
Client ID: LCSS	Batch ID: 15111					Analysis Date: 10/12/2016	SeqNo: 610763				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	22.8	5.00	25.00	0	91.1	65	135				
Surr: Toluene-d8	1.28		1.250		102	65	135				
Surr: 4-Bromofluorobenzene	1.25		1.250		100	65	135				

Sample ID MB-15111	SampType: MBLK	Units: mg/Kg				Prep Date: 10/12/2016	RunNo: 32293				
Client ID: MBLKS	Batch ID: 15111					Analysis Date: 10/12/2016	SeqNo: 610764				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.25		1.250		100	65	135				
Surr: 4-Bromofluorobenzene	1.20		1.250		95.8	65	135				

Sample ID 1610175-001BDUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 10/12/2016	RunNo: 32293				
Client ID: BATCH	Batch ID: 15111					Analysis Date: 10/13/2016	SeqNo: 610758				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	3.66						0		30	
Surr: Toluene-d8	0.932		0.9157		102	65	135		0		
Surr: 4-Bromofluorobenzene	0.870		0.9157		95.1	65	135		0		

Sample ID 1610175-006BMS	SampType: MS	Units: mg/Kg-dry				Prep Date: 10/12/2016	RunNo: 32293				
Client ID: BATCH	Batch ID: 15111					Analysis Date: 10/13/2016	SeqNo: 610886				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	14.0	3.34	16.71	0	83.5	65	135				
Surr: Toluene-d8	0.819		0.8353		98.0	65	135				
Surr: 4-Bromofluorobenzene	0.845		0.8353		101	65	135				

Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID	1610175-006BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32293		
Client ID:	BATCH	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610887		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	10.3	3.34	16.71	0	61.6	65	135	13.96	30.2	30	RS
Surr: Toluene-d8	0.846		0.8353		101	65	135		0		
Surr: 4-Bromofluorobenzene	0.867		0.8353		104	65	135		0		

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.
 R - High RPD observed.



Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-15120	SampType: MBLK	Units: mg/Kg	Prep Date: 10/13/2016	RunNo: 32297							
Client ID: MBLKS	Batch ID: 15120		Analysis Date: 10/13/2016	SeqNo: 610922							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID LCS-15120	SampType: LCS	Units: mg/Kg	Prep Date: 10/13/2016	RunNo: 32297							
Client ID: LCSS	Batch ID: 15120		Analysis Date: 10/13/2016	SeqNo: 610923							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.539 0.250 0.5000 0 108 80 120

Sample ID 1610162-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/13/2016	RunNo: 32297							
Client ID: BATCH	Batch ID: 15120		Analysis Date: 10/13/2016	SeqNo: 610925							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.259 0 20

Sample ID 1610162-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/13/2016	RunNo: 32297							
Client ID: BATCH	Batch ID: 15120		Analysis Date: 10/13/2016	SeqNo: 610926							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.599 0.275 0.5491 0.01680 106 70 130

Sample ID 1610162-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/13/2016	RunNo: 32297							
Client ID: BATCH	Batch ID: 15120		Analysis Date: 10/13/2016	SeqNo: 610927							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.592 0.269 0.5384 0.01680 107 70 130 0.5986 1.07 20

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID MB-15106	SampType: MBLK	Units: µg/Kg	Prep Date: 10/12/2016	RunNo: 32299
Client ID: MBLKS	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611006

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									Q
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									Q
Dibenz(a,h)anthracene	ND	40.0									Q
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	424		500.0		84.8	32.2	123				
Surr: Terphenyl-d14 (surr)	451		500.0		90.2	42.2	152				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID LCS-15106	SampType: LCS	Units: µg/Kg	Prep Date: 10/12/2016	RunNo: 32299
Client ID: LCSS	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611007

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	864	40.0	1,000	0	86.4	46.4	125				
2-Methylnaphthalene	890	40.0	1,000	0	89.0	45.1	135				
1-Methylnaphthalene	858	40.0	1,000	0	85.8	46.2	133				
Acenaphthylene	923	40.0	1,000	0	92.3	32.8	136				



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	LCS-15106	SampType:	LCS	Units:	µg/Kg	Prep Date:	10/12/2016	RunNo:	32299		
Client ID:	LCSS	Batch ID:	15106	Analysis Date:	10/13/2016	SeqNo:	611007				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	909	40.0	1,000	0	90.9	38.7	129				
Fluorene	864	40.0	1,000	0	86.4	41.1	132				
Phenanthrene	865	40.0	1,000	0	86.5	43.9	133				
Anthracene	922	40.0	1,000	0	92.2	44.2	136				
Fluoranthene	919	40.0	1,000	0	91.9	45.9	137				
Pyrene	913	40.0	1,000	0	91.3	46.2	137				
Benz(a)anthracene	808	40.0	1,000	0	80.8	41.9	136				
Chrysene	897	40.0	1,000	0	89.7	46.9	138				
Benzo(b)fluoranthene	818	40.0	1,000	0	81.8	35.9	148				
Benzo(k)fluoranthene	662	40.0	1,000	0	66.2	43.9	144				Q
Benzo(a)pyrene	652	40.0	1,000	0	65.2	36.3	144				
Indeno(1,2,3-cd)pyrene	509	40.0	1,000	0	50.9	41	140				Q
Dibenz(a,h)anthracene	391	40.0	1,000	0	39.1	33.8	133				Q
Benzo(g,h,i)perylene	655	40.0	1,000	0	65.5	32.9	112				
Surr: 2-Fluorobiphenyl	431		500.0		86.3	32.2	123				
Surr: Terphenyl-d14 (surr)	450		500.0		90.0	42.2	152				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID	1610175-001ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32299		
Client ID:	BATCH	Batch ID:	15106	Analysis Date:	10/13/2016	SeqNo:	611009				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	43.5						0		30	
2-Methylnaphthalene	ND	43.5						0		30	
1-Methylnaphthalene	ND	43.5						0		30	
Acenaphthylene	ND	43.5						0		30	
Acenaphthene	ND	43.5						0		30	
Fluorene	ND	43.5						0		30	
Phenanthrene	ND	43.5						0		30	
Anthracene	ND	43.5						0		30	

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1610175-001ADUP	SampType: DUP	Units: µg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: BATCH	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611009							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoranthene	ND	43.5						0		30	
Pyrene	ND	43.5						0		30	
Benz(a)anthracene	ND	43.5						0		30	
Chrysene	ND	43.5						0		30	
Benzo(b)fluoranthene	ND	43.5						0		30	
Benzo(k)fluoranthene	ND	43.5						0		30	Q
Benzo(a)pyrene	ND	43.5						0		30	
Indeno(1,2,3-cd)pyrene	ND	43.5						0		30	IQ
Dibenz(a,h)anthracene	ND	43.5						0		30	IQ
Benzo(g,h,i)perylene	ND	43.5						0		30	I
Surr: 2-Fluorobiphenyl	324		544.0		59.6	32.2	123		0		
Surr: Terphenyl-d14 (surr)	471		544.0		86.6	42.2	152		0		

NOTES:

I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID 1610175-001AMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: BATCH	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611010							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	752	40.0	999.5	0	75.2	42.9	138				
2-Methylnaphthalene	779	40.0	999.5	0	77.9	42.8	151				
1-Methylnaphthalene	751	40.0	999.5	0	75.1	41.6	148				
Acenaphthylene	810	40.0	999.5	0	81.0	32.6	160				
Acenaphthene	800	40.0	999.5	0	80.0	46.3	142				
Fluorene	758	40.0	999.5	0	75.8	43.4	153				
Phenanthrene	762	40.0	999.5	0	76.2	45.5	140				
Anthracene	806	40.0	999.5	0	80.7	32.6	160				
Fluoranthene	792	40.0	999.5	0	79.2	44.6	161				
Pyrene	791	40.0	999.5	0	79.1	48.3	158				
Benz(a)anthracene	683	40.0	999.5	0	68.4	57.5	169				

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1610175-001AMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: BATCH	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611010							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chrysene	784	40.0	999.5	0	78.5	45.2	146				
Benzo(b)fluoranthene	647	40.0	999.5	0	64.8	42.2	168				
Benzo(k)fluoranthene	613	40.0	999.5	0	61.3	48	161				Q
Benzo(a)pyrene	569	40.0	999.5	0	56.9	34.4	179				
Indeno(1,2,3-cd)pyrene	430	40.0	999.5	7.735	42.3	41.1	165				Q
Dibenz(a,h)anthracene	340	40.0	999.5	10.21	33.0	38.1	166				SQ
Benzo(g,h,i)perylene	542	40.0	999.5	4.379	53.8	45.6	157				
Surr: 2-Fluorobiphenyl	368		499.7		73.6	32.2	123				
Surr: Terphenyl-d14 (surr)	397		499.7		79.5	42.2	152				

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID 1610175-001AMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: BATCH	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611011							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	893	46.7	1,168	0	76.5	42.9	138	751.7	17.2	30	
2-Methylnaphthalene	925	46.7	1,168	0	79.2	42.8	151	778.8	17.1	30	
1-Methylnaphthalene	890	46.7	1,168	0	76.2	41.6	148	750.6	17.1	30	
Acenaphthylene	960	46.7	1,168	0	82.2	32.6	160	809.9	16.9	30	
Acenaphthene	949	46.7	1,168	0	81.2	46.3	142	800.0	17.0	30	
Fluorene	895	46.7	1,168	0	76.7	43.4	153	757.5	16.7	30	
Phenanthrene	898	46.7	1,168	0	76.9	45.5	140	762.1	16.4	30	
Anthracene	954	46.7	1,168	0	81.7	32.6	160	806.4	16.8	30	
Fluoranthene	938	46.7	1,168	0	80.3	44.6	161	791.8	16.9	30	
Pyrene	932	46.7	1,168	0	79.8	48.3	158	790.7	16.4	30	
Benz(a)anthracene	819	46.7	1,168	0	70.1	57.5	169	683.4	18.0	30	
Chrysene	934	46.7	1,168	0	80.0	45.2	146	784.3	17.5	30	
Benzo(b)fluoranthene	827	46.7	1,168	0	70.9	42.2	168	647.3	24.4	30	
Benzo(k)fluoranthene	697	46.7	1,168	0	59.7	48	161	612.6	12.9	30	Q

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	1610175-001AMSD	SampType:	MSD	Units:	µg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32299		
Client ID:	BATCH	Batch ID:	15106			Analysis Date:	10/13/2016	SeqNo:	611011		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(a)pyrene	657	46.7	1,168	0	56.3	34.4	179	569.1	14.3	30	
Indeno(1,2,3-cd)pyrene	533	46.7	1,168	7.735	45.0	41.1	165	430.5	21.3	30	Q
Dibenz(a,h)anthracene	456	46.7	1,168	10.21	38.2	38.1	166	340.0	29.2	30	Q
Benzo(g,h,i)perylene	684	46.7	1,168	4.379	58.2	45.6	157	541.7	23.2	30	
Surr: 2-Fluorobiphenyl	417		583.9		71.4	32.2	123		0		
Surr: Terphenyl-d14 (surr)	467		583.9		80.0	42.2	152		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.



Date: 10/13/2016

Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID 1610175-006ADUP	SampType: DUP	Units: wt%			Prep Date: 10/12/2016	RunNo: 32275					
Client ID: BATCH	Batch ID: R32275				Analysis Date: 10/12/2016	SeqNo: 610305					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	16.7	0.500						16.46	1.25	20	



Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-15108	SampType: MBLK	Units: mg/Kg		Prep Date: 10/12/2016	RunNo: 32296						
Client ID: MBLKS	Batch ID: 15108			Analysis Date: 10/13/2016	SeqNo: 610851						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.0781									
Barium	ND	0.391									
Cadmium	ND	0.156									
Chromium	ND	0.0781									
Lead	ND	0.156									
Selenium	ND	0.391									
Silver	ND	0.0781									

Sample ID LCS-15108	SampType: LCS	Units: mg/Kg		Prep Date: 10/12/2016	RunNo: 32296						
Client ID: LCSS	Batch ID: 15108			Analysis Date: 10/13/2016	SeqNo: 610852						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	36.8	0.0781	39.06	0	94.3	80	120				
Barium	39.1	0.391	39.06	0	100	80	120				
Cadmium	1.93	0.156	1.953	0	98.8	80	120				
Chromium	38.4	0.0781	39.06	0	98.3	80	120				
Lead	19.4	0.156	19.53	0	99.6	80	120				
Selenium	3.51	0.391	3.906	0	89.9	80	120				
Silver	1.59	0.0781	1.953	0	81.4	80	120				

Sample ID 1610174-001ADUP	SampType: DUP	Units: mg/Kg-dry		Prep Date: 10/12/2016	RunNo: 32296						
Client ID: W6-15	Batch ID: 15108			Analysis Date: 10/13/2016	SeqNo: 610854						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	5.47	0.0893						5.100	7.05	20	
Barium	93.9	0.446						84.31	10.7	20	
Cadmium	ND	0.179						0		20	
Chromium	39.1	0.0893						35.82	8.87	20	
Lead	11.0	0.179						9.040	19.1	20	
Selenium	1.41	0.446						1.385	1.61	20	

Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1610174-001ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32296					
Client ID: W6-15	Batch ID: 15108				Analysis Date: 10/13/2016	SeqNo: 610854					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Silver	ND	0.0893						0		20	

Sample ID 1610174-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32296					
Client ID: W6-15	Batch ID: 15108				Analysis Date: 10/13/2016	SeqNo: 610856					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	47.7	0.0886	44.32	5.100	96.2	75	125				
Barium	147	0.443	44.32	84.31	142	75	125				S
Cadmium	2.16	0.177	2.216	0.09826	93.0	75	125				
Chromium	89.5	0.0886	44.32	35.82	121	75	125				
Lead	36.5	0.177	22.16	9.040	124	75	125				
Selenium	5.22	0.443	4.432	1.385	86.5	75	125				
Silver	1.20	0.0886	2.216	0.04011	52.4	75	125				S

NOTES:

S - Outlying spike recovery(ies) observed for Barium and Silver. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1610174-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32296					
Client ID: W6-15	Batch ID: 15108				Analysis Date: 10/13/2016	SeqNo: 610857					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.1	0.0886	44.32	5.100	99.3	75	125	47.74	2.80	20	
Barium	143	0.443	44.32	84.31	132	75	125	147.2	3.17	20	S
Cadmium	2.13	0.177	2.216	0.09826	91.6	75	125	2.158	1.45	20	
Chromium	90.2	0.0886	44.32	35.82	123	75	125	89.49	0.779	20	
Lead	40.7	0.177	22.16	9.040	143	75	125	36.50	10.9	20	S
Selenium	5.48	0.443	4.432	1.385	92.3	75	125	5.217	4.83	20	
Silver	1.20	0.0886	2.216	0.04011	52.5	75	125	1.201	0.184	20	S

NOTES:

S - Outlying spike recovery(ies) observed for Barium and Silver. A duplicate analysis was performed with similar results indicating a possible matrix effect.

S - Outlying spike recovery(ies) observed for Lead. A duplicate analysis was performed and recovered within range.



Date: 10/13/2016

Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1610174-001APDS	SampType: PDS	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32296							
Client ID: W6-15	Batch ID: 15108	Analysis Date: 10/13/2016	SeqNo: 610858								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Barium	286	0.450	50.0	187	98.7	80	120				
Silver	2.72	0.0899	2.50	0.0892	52.7	80	120				S

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15111	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	LCSS	Batch ID:	15111	Analysis Date:	10/12/2016	SeqNo:	610736				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	1.34	0.0600	1.000	0	134	34.5	141				
Chloromethane	0.993	0.0600	1.000	0	99.3	38.8	132				
Vinyl chloride	0.925	0.00200	1.000	0	92.5	44	142				
Bromomethane	0.910	0.0900	1.000	0	91.0	40.9	157				
Trichlorofluoromethane (CFC-11)	0.833	0.0500	1.000	0	83.3	42.9	147				
Chloroethane	0.876	0.0600	1.000	0	87.6	37.1	144				
1,1-Dichloroethene	0.939	0.0500	1.000	0	93.9	49.7	142				
Methylene chloride	1.05	0.0200	1.000	0	105	46.3	140				
trans-1,2-Dichloroethene	1.06	0.0200	1.000	0	106	68	130				
Methyl tert-butyl ether (MTBE)	1.02	0.0500	1.000	0	102	59.1	138				
1,1-Dichloroethane	0.977	0.0200	1.000	0	97.7	61.9	137				
2,2-Dichloropropane	0.798	0.0500	1.000	0	79.8	28.1	149				Q
cis-1,2-Dichloroethene	0.981	0.0200	1.000	0	98.1	71.3	135				
Chloroform	1.16	0.0200	1.000	0	116	67.5	129				
1,1,1-Trichloroethane (TCA)	0.982	0.0200	1.000	0	98.2	69	132				
1,1-Dichloropropene	0.963	0.0200	1.000	0	96.3	72.7	131				
Carbon tetrachloride	0.849	0.0200	1.000	0	84.9	63.4	137				Q
1,2-Dichloroethane (EDC)	1.00	0.0300	1.000	0	100	61.9	136				
Benzene	1.01	0.0200	1.000	0	101	64.3	133				
Trichloroethene (TCE)	1.01	0.0200	1.000	0	101	65.5	137				
1,2-Dichloropropane	1.02	0.0200	1.000	0	102	63.2	142				
Bromodichloromethane	0.970	0.0200	1.000	0	97.0	73.2	131				
Dibromomethane	0.990	0.0400	1.000	0	99.0	70	130				
cis-1,3-Dichloropropene	0.951	0.0200	1.000	0	95.1	59.1	143				
Toluene	0.992	0.0200	1.000	0	99.2	67.3	138				
trans-1,3-Dichloropropylene	0.921	0.0300	1.000	0	92.1	49.2	149				
1,1,2-Trichloroethane	0.985	0.0300	1.000	0	98.5	74.5	129				
1,3-Dichloropropane	0.973	0.0500	1.000	0	97.3	70	130				
Tetrachloroethene (PCE)	0.980	0.0200	1.000	0	98.0	52.7	150				
Dibromochloromethane	0.936	0.0300	1.000	0	93.6	70.6	144				
1,2-Dibromoethane (EDB)	0.979	0.00500	1.000	0	97.9	70	130				



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15111	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	LCSS	Batch ID:	15111	Analysis Date:	10/12/2016	SeqNo:	610736				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	0.924	0.0200	1.000	0	92.4	76.1	123				
1,1,1,2-Tetrachloroethane	0.968	0.0300	1.000	0	96.8	65.9	141				
Ethylbenzene	0.967	0.0300	1.000	0	96.7	74	129				
m,p-Xylene	1.96	0.0200	2.000	0	98.0	70	124				
o-Xylene	0.967	0.0200	1.000	0	96.7	72.7	124				
Styrene	0.971	0.0200	1.000	0	97.1	76.8	130				
Isopropylbenzene	0.958	0.0800	1.000	0	95.8	70	130				
Bromoform	0.909	0.0200	1.000	0	90.9	67	154				Q
1,1,2,2-Tetrachloroethane	0.924	0.0200	1.000	0	92.4	60	130				
n-Propylbenzene	0.973	0.0200	1.000	0	97.3	74.8	125				
Bromobenzene	0.993	0.0300	1.000	0	99.3	49.2	144				
1,3,5-Trimethylbenzene	0.975	0.0200	1.000	0	97.5	74.6	123				
2-Chlorotoluene	0.980	0.0200	1.000	0	98.0	76.7	129				
4-Chlorotoluene	0.963	0.0200	1.000	0	96.3	77.5	125				
tert-Butylbenzene	0.968	0.0200	1.000	0	96.8	66.2	130				
1,2,3-Trichloropropane	1.03	0.0200	1.000	0	103	67.9	136				
1,2,4-Trichlorobenzene	0.976	0.0500	1.000	0	97.6	62.6	143				
sec-Butylbenzene	0.951	0.0200	1.000	0	95.1	75.6	133				
4-Isopropyltoluene	0.970	0.0200	1.000	0	97.0	76.8	131				
1,3-Dichlorobenzene	1.02	0.0200	1.000	0	102	72.8	128				
1,4-Dichlorobenzene	1.07	0.0200	1.000	0	107	72.6	126				
n-Butylbenzene	0.972	0.0200	1.000	0	97.2	65.3	136				
1,2-Dichlorobenzene	1.03	0.0200	1.000	0	103	72.8	126				
1,2-Dibromo-3-chloropropane	0.953	0.500	1.000	0	95.3	61.2	139				
1,2,4-Trimethylbenzene	0.970	0.0200	1.000	0	97.0	77.5	129				
Hexachlorobutadiene	0.995	0.100	1.000	0	99.5	42	151				
Naphthalene	0.947	0.0300	1.000	0	94.7	62.3	134				
1,2,3-Trichlorobenzene	0.961	0.0200	1.000	0	96.1	54.8	143				
Surr: Dibromofluoromethane	1.28		1.250		102	56.5	129				
Surr: Toluene-d8	1.36		1.250		109	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.31		1.250		105	63.1	141				



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15111	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292				
Client ID:	LCSS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610736				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	MB-15111	SampType:	MBLK	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292				
Client ID:	MBLKS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610737				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0600											
Chloromethane	ND	0.0600											
Vinyl chloride	ND	0.00200											
Bromomethane	ND	0.0900											
Trichlorofluoromethane (CFC-11)	ND	0.0500											
Chloroethane	ND	0.0600											
1,1-Dichloroethene	ND	0.0500											
Methylene chloride	ND	0.0200											
trans-1,2-Dichloroethene	ND	0.0200											
Methyl tert-butyl ether (MTBE)	ND	0.0500											
1,1-Dichloroethane	ND	0.0200											
2,2-Dichloropropane	ND	0.0500											Q
cis-1,2-Dichloroethene	ND	0.0200											
Chloroform	ND	0.0200											
1,1,1-Trichloroethane (TCA)	ND	0.0200											
1,1-Dichloropropene	ND	0.0200											
Carbon tetrachloride	ND	0.0200											Q
1,2-Dichloroethane (EDC)	ND	0.0300											
Benzene	ND	0.0200											
Trichloroethene (TCE)	ND	0.0200											
1,2-Dichloropropane	ND	0.0200											
Bromodichloromethane	ND	0.0200											
Dibromomethane	ND	0.0400											
cis-1,3-Dichloropropene	ND	0.0200											



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15111	SampType: MBLK	Units: mg/Kg	Prep Date: 10/12/2016	RunNo: 32292							
Client ID: MBLKS	Batch ID: 15111		Analysis Date: 10/12/2016	SeqNo: 610737							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									Q
1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									
tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									
sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									
1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									
1,2-Dichlorobenzene	ND	0.0200									
1,2-Dibromo-3-chloropropane	ND	0.500									



Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15111	SampType: MBLK	Units: mg/Kg			Prep Date: 10/12/2016	RunNo: 32292					
Client ID: MBLKS	Batch ID: 15111				Analysis Date: 10/12/2016	SeqNo: 610737					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.24		1.250		99.0	56.5	129				
Surr: Toluene-d8	1.23		1.250		98.7	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.18		1.250		94.5	63.1	141				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610175-001BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32292					
Client ID: BATCH	Batch ID: 15111				Analysis Date: 10/13/2016	SeqNo: 610730					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	ND	0.0440						0		30	
Chloromethane	ND	0.0440						0		30	
Vinyl chloride	ND	0.00147						0		30	
Bromomethane	ND	0.0659						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0366						0		30	
Chloroethane	ND	0.0440						0		30	
1,1-Dichloroethene	ND	0.0366						0		30	
Methylene chloride	ND	0.0147						0		30	
trans-1,2-Dichloroethene	ND	0.0147						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0366						0		30	
1,1-Dichloroethane	ND	0.0147						0		30	
2,2-Dichloropropane	ND	0.0366						0		30	Q
cis-1,2-Dichloroethene	ND	0.0147						0		30	
Chloroform	ND	0.0147						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0147						0		30	
1,1-Dichloropropene	ND	0.0147						0		30	
Carbon tetrachloride	ND	0.0147						0		30	Q



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610175-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292							
Client ID: BATCH	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610730							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dichloroethane (EDC)	ND	0.0220						0		30	
Benzene	ND	0.0147						0		30	
Trichloroethene (TCE)	ND	0.0147						0		30	
1,2-Dichloropropane	ND	0.0147						0		30	
Bromodichloromethane	ND	0.0147						0		30	
Dibromomethane	ND	0.0293						0		30	
cis-1,3-Dichloropropene	ND	0.0147						0		30	
Toluene	ND	0.0147						0		30	
trans-1,3-Dichloropropylene	ND	0.0220						0		30	
1,1,2-Trichloroethane	ND	0.0220						0		30	
1,3-Dichloropropane	ND	0.0366						0		30	
Tetrachloroethene (PCE)	ND	0.0147						0		30	
Dibromochloromethane	ND	0.0220						0		30	
1,2-Dibromoethane (EDB)	ND	0.00366						0		30	
Chlorobenzene	ND	0.0147						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0220						0		30	
Ethylbenzene	ND	0.0220						0		30	
m,p-Xylene	ND	0.0147						0		30	
o-Xylene	ND	0.0147						0		30	
Styrene	ND	0.0147						0		30	
Isopropylbenzene	ND	0.0586						0		30	
Bromoform	ND	0.0147						0		30	Q
1,1,2,2-Tetrachloroethane	ND	0.0147						0		30	
n-Propylbenzene	ND	0.0147						0		30	
Bromobenzene	ND	0.0220						0		30	
1,3,5-Trimethylbenzene	ND	0.0147						0		30	
2-Chlorotoluene	ND	0.0147						0		30	
4-Chlorotoluene	ND	0.0147						0		30	
tert-Butylbenzene	ND	0.0147						0		30	
1,2,3-Trichloropropane	ND	0.0147						0		30	
1,2,4-Trichlorobenzene	ND	0.0366						0		30	

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610175-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292							
Client ID: BATCH	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610730							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

sec-Butylbenzene	ND	0.0147						0		30	
4-Isopropyltoluene	ND	0.0147						0		30	
1,3-Dichlorobenzene	ND	0.0147						0		30	
1,4-Dichlorobenzene	ND	0.0147						0		30	
n-Butylbenzene	ND	0.0147						0		30	
1,2-Dichlorobenzene	ND	0.0147						0		30	
1,2-Dibromo-3-chloropropane	ND	0.366						0		30	
1,2,4-Trimethylbenzene	ND	0.0147						0		30	
Hexachlorobutadiene	ND	0.0733						0		30	
Naphthalene	ND	0.0220						0		30	
1,2,3-Trichlorobenzene	ND	0.0147						0		30	
Surr: Dibromofluoromethane	0.835		0.9157		91.2	56.5	129		0		
Surr: Toluene-d8	0.952		0.9157		104	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.865		0.9157		94.4	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610175-003BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292							
Client ID: BATCH	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610732							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.406	0.0370	0.6161	0	65.9	43.5	121				
Chloromethane	0.704	0.0370	0.6161	0	114	45	130				
Vinyl chloride	0.599	0.00123	0.6161	0	97.2	51.2	146				
Bromomethane	0.756	0.0555	0.6161	0	123	21.3	120				S
Trichlorofluoromethane (CFC-11)	1.15	0.0308	0.6161	0	187	35	131				S
Chloroethane	0.825	0.0370	0.6161	0	134	43.8	117				S
1,1-Dichloroethene	0.765	0.0308	0.6161	0	124	61.9	141				
Methylene chloride	0.646	0.0123	0.6161	0	105	54.7	142				
trans-1,2-Dichloroethene	0.661	0.0123	0.6161	0	107	52	136				
Methyl tert-butyl ether (MTBE)	0.614	0.0308	0.6161	0	99.7	54.4	132				



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610175-003BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292							
Client ID: BATCH	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610732							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethane	0.622	0.0123	0.6161	0	101	51.8	141				
2,2-Dichloropropane	0.312	0.0308	0.6161	0	50.7	36	123				Q
cis-1,2-Dichloroethane	0.615	0.0123	0.6161	0	99.8	58.6	136				
Chloroform	0.636	0.0123	0.6161	0.002069	103	53.2	129				
1,1,1-Trichloroethane (TCA)	0.611	0.0123	0.6161	0	99.2	58.3	145				
1,1-Dichloropropene	0.640	0.0123	0.6161	0	104	55.1	138				
Carbon tetrachloride	0.552	0.0123	0.6161	0	89.5	53.3	144				Q
1,2-Dichloroethane (EDC)	0.620	0.0185	0.6161	0	101	51.3	139				
Benzene	0.644	0.0123	0.6161	0	104	63.5	133				
Trichloroethene (TCE)	0.665	0.0123	0.6161	0	108	68.6	132				
1,2-Dichloropropane	0.644	0.0123	0.6161	0	104	59	136				
Bromodichloromethane	0.577	0.0123	0.6161	0	93.6	50.7	141				
Dibromomethane	0.644	0.0246	0.6161	0	105	50.6	137				
cis-1,3-Dichloropropene	0.546	0.0123	0.6161	0	88.7	50.4	138				
Toluene	0.653	0.0123	0.6161	0.007079	105	63.4	132				
trans-1,3-Dichloropropylene	0.532	0.0185	0.6161	0	86.4	44.1	147				
1,1,2-Trichloroethane	0.631	0.0185	0.6161	0	102	51.6	137				
1,3-Dichloropropane	0.639	0.0308	0.6161	0	104	53.1	134				
Tetrachloroethene (PCE)	0.671	0.0123	0.6161	0	109	35.6	158				
Dibromochloromethane	0.562	0.0185	0.6161	0	91.2	55.3	140				
1,2-Dibromoethane (EDB)	0.606	0.00308	0.6161	0	98.4	50.4	136				
Chlorobenzene	0.610	0.0123	0.6161	0	98.9	60	133				
1,1,1,2-Tetrachloroethane	0.599	0.0185	0.6161	0	97.2	53.1	142				
Ethylbenzene	0.629	0.0185	0.6161	0	102	54.5	134				
m,p-Xylene	1.25	0.0123	1.232	0	102	53.1	132				
o-Xylene	0.614	0.0123	0.6161	0	99.6	53.3	139				
Styrene	0.618	0.0123	0.6161	0	100	51.1	132				
Isopropylbenzene	0.627	0.0493	0.6161	0	102	58.9	138				
Bromoform	0.529	0.0123	0.6161	0	85.8	57.9	130				Q
1,1,2,2-Tetrachloroethane	0.563	0.0123	0.6161	0	91.4	51.9	131				
n-Propylbenzene	0.636	0.0123	0.6161	0	103	53.6	140				



Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1610175-003BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	BATCH	Batch ID:	15111	Analysis Date:	10/13/2016	SeqNo:	610732				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromobenzene	0.632	0.0185	0.6161	0	102	54.2	140				
1,3,5-Trimethylbenzene	0.627	0.0123	0.6161	0	102	51.8	136				
2-Chlorotoluene	0.621	0.0123	0.6161	0	101	51.6	136				
4-Chlorotoluene	0.641	0.0123	0.6161	0	104	50.1	139				
tert-Butylbenzene	0.634	0.0123	0.6161	0	103	50.5	135				
1,2,3-Trichloropropane	0.592	0.0123	0.6161	0	96.0	50.5	131				
1,2,4-Trichlorobenzene	0.734	0.0308	0.6161	0	119	50.8	130				
sec-Butylbenzene	0.636	0.0123	0.6161	0	103	52.6	141				
4-Isopropyltoluene	0.631	0.0123	0.6161	0	102	52.9	134				
1,3-Dichlorobenzene	0.653	0.0123	0.6161	0	106	52.6	131				
1,4-Dichlorobenzene	0.661	0.0123	0.6161	0	107	52.9	129				
n-Butylbenzene	0.674	0.0123	0.6161	0	109	52.6	130				
1,2-Dichlorobenzene	0.651	0.0123	0.6161	0	106	55.8	129				
1,2-Dibromo-3-chloropropane	0.571	0.308	0.6161	0	92.7	40.5	131				
1,2,4-Trimethylbenzene	0.618	0.0123	0.6161	0	100	50.6	137				
Hexachlorobutadiene	0.685	0.0616	0.6161	0	111	40.6	158				
Naphthalene	0.710	0.0185	0.6161	0	115	52.3	124				
1,2,3-Trichlorobenzene	0.749	0.0123	0.6161	0	122	54.4	124				
Surr: Dibromofluoromethane	0.756		0.7702		98.2	56.5	129				
Surr: Toluene-d8	0.867		0.7702		113	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	0.843		0.7702		109	63.1	141				

NOTES:

S - Outlying spike recovery(ies) observed. The method is in control as indicated by the Laboratory Control Sample (LCS).

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	1610175-003BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	BATCH	Batch ID:	15111	Analysis Date:	10/13/2016	SeqNo:	610876				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.353	0.0370	0.6161	0	57.4	43.5	121	0.4062	13.9	30	
Chloromethane	0.760	0.0370	0.6161	0	123	45	130	0.7044	7.58	30	

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1610175-003BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	BATCH	Batch ID:	15111	Analysis Date:	10/13/2016	SeqNo:	610876				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	0.560	0.00123	0.6161	0	90.8	51.2	146	0.5990	6.80	30	
Bromomethane	0.713	0.0555	0.6161	0	116	21.3	120	0.7556	5.79	30	
Trichlorofluoromethane (CFC-11)	1.15	0.0308	0.6161	0	186	35	131	1.150	0.161	30	S
Chloroethane	0.711	0.0370	0.6161	0	115	43.8	117	0.8252	14.9	30	
1,1-Dichloroethene	0.786	0.0308	0.6161	0	128	61.9	141	0.7645	2.77	30	
Methylene chloride	0.715	0.0123	0.6161	0	116	54.7	142	0.6458	10.2	30	
trans-1,2-Dichloroethene	0.718	0.0123	0.6161	0	116	52	136	0.6609	8.24	30	
Methyl tert-butyl ether (MTBE)	0.694	0.0308	0.6161	0	113	54.4	132	0.6144	12.2	30	
1,1-Dichloroethane	0.574	0.0123	0.6161	0	93.2	51.8	141	0.6221	7.98	30	
2,2-Dichloropropane	0.292	0.0308	0.6161	0	47.3	36	123	0.3124	6.90	30	Q
cis-1,2-Dichloroethene	0.578	0.0123	0.6161	0	93.8	58.6	136	0.6146	6.14	30	
Chloroform	0.616	0.0123	0.6161	0.002069	99.7	53.2	129	0.6362	3.17	30	
1,1,1-Trichloroethane (TCA)	0.581	0.0123	0.6161	0	94.3	58.3	145	0.6114	5.05	30	
1,1-Dichloropropene	0.587	0.0123	0.6161	0	95.3	55.1	138	0.6397	8.54	30	
Carbon tetrachloride	0.540	0.0123	0.6161	0	87.7	53.3	144	0.5516	2.06	30	Q
1,2-Dichloroethane (EDC)	0.567	0.0185	0.6161	0	92.1	51.3	139	0.6197	8.85	30	
Benzene	0.616	0.0123	0.6161	0	100	63.5	133	0.6436	4.41	30	
Trichloroethene (TCE)	0.621	0.0123	0.6161	0	101	68.6	132	0.6649	6.81	30	
1,2-Dichloropropane	0.590	0.0123	0.6161	0	95.7	59	136	0.6438	8.76	30	
Bromodichloromethane	0.552	0.0123	0.6161	0	89.6	50.7	141	0.5765	4.33	30	
Dibromomethane	0.584	0.0246	0.6161	0	94.8	50.6	137	0.6444	9.84	30	
cis-1,3-Dichloropropene	0.499	0.0123	0.6161	0	81.1	50.4	138	0.5464	8.98	30	
Toluene	0.608	0.0123	0.6161	0.007079	97.5	63.4	132	0.6529	7.19	30	
trans-1,3-Dichloropropylene	0.529	0.0185	0.6161	0	85.9	44.1	147	0.5322	0.560	30	
1,1,2-Trichloroethane	0.584	0.0185	0.6161	0	94.7	51.6	137	0.6314	7.88	30	
1,3-Dichloropropane	0.606	0.0308	0.6161	0	98.4	53.1	134	0.6394	5.34	30	
Tetrachloroethene (PCE)	0.609	0.0123	0.6161	0	98.8	35.6	158	0.6707	9.64	30	
Dibromochloromethane	0.521	0.0185	0.6161	0	84.6	55.3	140	0.5617	7.52	30	
1,2-Dibromoethane (EDB)	0.603	0.00308	0.6161	0	97.9	50.4	136	0.6065	0.496	30	
Chlorobenzene	0.583	0.0123	0.6161	0	94.7	60	133	0.6095	4.40	30	
1,1,1,2-Tetrachloroethane	0.560	0.0185	0.6161	0	90.8	53.1	142	0.5990	6.82	30	

Work Order: 1610174
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1610175-003BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	BATCH	Batch ID:	15111	Analysis Date:	10/13/2016	SeqNo:	610876				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ethylbenzene	0.596	0.0185	0.6161	0	96.8	54.5	134	0.6289	5.31	30	
m,p-Xylene	1.17	0.0123	1.232	0	94.7	53.1	132	1.254	7.20	30	
o-Xylene	0.600	0.0123	0.6161	0	97.4	53.3	139	0.6138	2.24	30	
Styrene	0.607	0.0123	0.6161	0	98.6	51.1	132	0.6177	1.72	30	
Isopropylbenzene	0.587	0.0493	0.6161	0	95.4	58.9	138	0.6271	6.52	30	
Bromoform	0.496	0.0123	0.6161	0	80.5	57.9	130	0.5287	6.38	30	Q
1,1,2,2-Tetrachloroethane	0.556	0.0123	0.6161	0	90.3	51.9	131	0.5634	1.27	30	
n-Propylbenzene	0.603	0.0123	0.6161	0	97.9	53.6	140	0.6364	5.34	30	
Bromobenzene	0.600	0.0185	0.6161	0	97.5	54.2	140	0.6315	5.04	30	
1,3,5-Trimethylbenzene	0.587	0.0123	0.6161	0	95.3	51.8	136	0.6273	6.60	30	
2-Chlorotoluene	0.588	0.0123	0.6161	0	95.5	51.6	136	0.6213	5.47	30	
4-Chlorotoluene	0.605	0.0123	0.6161	0	98.1	50.1	139	0.6409	5.83	30	
tert-Butylbenzene	0.599	0.0123	0.6161	0	97.1	50.5	135	0.6341	5.78	30	
1,2,3-Trichloropropane	0.563	0.0123	0.6161	0	91.5	50.5	131	0.5916	4.87	30	
1,2,4-Trichlorobenzene	0.780	0.0308	0.6161	0	127	50.8	130	0.7337	6.05	30	
sec-Butylbenzene	0.594	0.0123	0.6161	0	96.5	52.6	141	0.6362	6.79	30	
4-Isopropyltoluene	0.588	0.0123	0.6161	0	95.5	52.9	134	0.6313	7.08	30	
1,3-Dichlorobenzene	0.666	0.0123	0.6161	0	108	52.6	131	0.6526	2.01	30	
1,4-Dichlorobenzene	0.677	0.0123	0.6161	0	110	52.9	129	0.6614	2.32	30	
n-Butylbenzene	0.667	0.0123	0.6161	0	108	52.6	130	0.6738	1.05	30	
1,2-Dichlorobenzene	0.673	0.0123	0.6161	0	109	55.8	129	0.6515	3.20	30	
1,2-Dibromo-3-chloropropane	0.574	0.308	0.6161	0	93.2	40.5	131	0.5711	0.536	30	
1,2,4-Trimethylbenzene	0.593	0.0123	0.6161	0	96.3	50.6	137	0.6176	3.98	30	
Hexachlorobutadiene	0.730	0.0616	0.6161	0	118	40.6	158	0.6847	6.41	30	
Naphthalene	0.791	0.0185	0.6161	0	128	52.3	124	0.7096	10.9	30	S
1,2,3-Trichlorobenzene	0.815	0.0123	0.6161	0	132	54.4	124	0.7490	8.40	30	S
Surr: Dibromofluoromethane	0.715		0.7702		92.8	56.5	129		0		
Surr: Toluene-d8	0.823		0.7702		107	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.820		0.7702		106	63.1	141		0		



Date: 10/13/2016

Work Order: 1610174
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1610175-003BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	BATCH	Batch ID:	15111	Analysis Date:	10/13/2016	SeqNo:	610876				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

- S - Outlying spike recovery(ies) observed. The method is in control as indicated by the Laboratory Control Sample (LCS).
- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Client Name: **GEI**
 Logged by: **Clare Griggs**

Work Order Number: **1610174**
 Date Received: **10/12/2016 8:55:00 AM**

Chain of Custody

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

Log In

3. Coolers are present? Yes No NA
 4. Shipping container/cooler in good condition? Yes No
 5. Custody Seals present on shipping container/cooler?
 (Refer to comments for Custody Seals not intact) Yes No Not Required
 6. Was an attempt made to cool the samples? Yes No NA
 7. Were all items received at a temperature of >0°C to 10.0°C * Yes No NA
 8. Sample(s) in proper container(s)? Yes No
 9. Sufficient sample volume for indicated test(s)? Yes No
 10. Are samples properly preserved? Yes No
 11. Was preservative added to bottles? Yes No NA
 12. Is there headspace in the VOA vials? Yes No NA
 13. Did all samples containers arrive in good condition(unbroken)? Yes No
 14. Does paperwork match bottle labels? Yes No
 15. Are matrices correctly identified on Chain of Custody? Yes No
 16. Is it clear what analyses were requested? Yes No
 17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	6.6
Sample	3.3

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

Original



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

GeoEngineers

Chris Brown
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Rufus Block 20
Work Order Number: 1610175

October 13, 2016

Attention Chris Brown:

Fremont Analytical, Inc. received 6 sample(s) on 10/12/2016 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Gasoline by NWTPH-Gx
Mercury by EPA Method 7471
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)
Total Metals by EPA Method 6020
Volatile Organic Compounds by EPA Method 8260C

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)



CLIENT: GeoEngineers
Project: Rufus Block 20
Work Order: 1610175

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1610175-001	W6S46-15	10/11/2016 3:55 PM	10/12/2016 8:55 AM
1610175-002	W6S46-20	10/11/2016 4:00 PM	10/12/2016 8:55 AM
1610175-003	W6S46-30	10/11/2016 4:05 PM	10/12/2016 8:55 AM
1610175-004	W6S46-40	10/11/2016 4:10 PM	10/12/2016 8:55 AM
1610175-005	W6S46-50	10/11/2016 4:15 PM	10/12/2016 8:55 AM
1610175-006	W9S46-15	10/11/2016 4:50 PM	10/12/2016 8:55 AM

CLIENT: GeoEngineers
Project: Rufus Block 20

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Client: GeoEngineers

Collection Date: 10/11/2016 3:55:00 PM

Project: Rufus Block 20

Lab ID: 1610175-001

Matrix: Soil

Client Sample ID: W6S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15107

Analyst: WC

Diesel (Fuel Oil)	ND	22.3		mg/Kg-dry	1	10/13/2016 4:10:00 AM
Heavy Oil	ND	55.7		mg/Kg-dry	1	10/13/2016 4:10:00 AM
Surr: 2-Fluorobiphenyl	92.1	50-150		%Rec	1	10/13/2016 4:10:00 AM
Surr: o-Terphenyl	91.4	50-150		%Rec	1	10/13/2016 4:10:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15106

Analyst: BT

Naphthalene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
2-Methylnaphthalene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
1-Methylnaphthalene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Acenaphthylene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Acenaphthene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Fluorene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Phenanthrene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Anthracene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Fluoranthene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Pyrene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Benz(a)anthracene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Chrysene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Benzo(b)fluoranthene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Benzo(k)fluoranthene	ND	42.4	Q	µg/Kg-dry	1	10/13/2016 1:58:01 PM
Benzo(a)pyrene	ND	42.4		µg/Kg-dry	1	10/13/2016 1:58:01 PM
Indeno(1,2,3-cd)pyrene	ND	42.4	IQ	µg/Kg-dry	1	10/13/2016 1:58:01 PM
Dibenz(a,h)anthracene	ND	42.4	IQ	µg/Kg-dry	1	10/13/2016 1:58:01 PM
Benzo(g,h,i)perylene	ND	42.4	I	µg/Kg-dry	1	10/13/2016 1:58:01 PM
Surr: 2-Fluorobiphenyl	52.3	32.2-123		%Rec	1	10/13/2016 1:58:01 PM
Surr: Terphenyl-d14 (surr)	79.1	42.2-152		%Rec	1	10/13/2016 1:58:01 PM

NOTES:

I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Gasoline by NWTPH-Gx

Batch ID: 15111

Analyst: NG

Gasoline	ND	3.66		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Surr: Toluene-d8	102	65-135		%Rec	1	10/13/2016 9:42:27 AM
Surr: 4-Bromofluorobenzene	94.2	65-135		%Rec	1	10/13/2016 9:42:27 AM



Client: GeoEngineers

Collection Date: 10/11/2016 3:55:00 PM

Project: Rufus Block 20

Lab ID: 1610175-001

Matrix: Soil

Client Sample ID: W6S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111

Analyst: NG

Dichlorodifluoromethane (CFC-12)	ND	0.0440		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Chloromethane	ND	0.0440		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Vinyl chloride	ND	0.00147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Bromomethane	ND	0.0659		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Trichlorofluoromethane (CFC-11)	ND	0.0366		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Chloroethane	ND	0.0440		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,1-Dichloroethene	ND	0.0366		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Methylene chloride	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
trans-1,2-Dichloroethene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Methyl tert-butyl ether (MTBE)	ND	0.0366		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,1-Dichloroethane	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
2,2-Dichloropropane	ND	0.0366	Q	mg/Kg-dry	1	10/13/2016 9:42:27 AM
cis-1,2-Dichloroethene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Chloroform	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,1,1-Trichloroethane (TCA)	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,1-Dichloropropene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Carbon tetrachloride	ND	0.0147	Q	mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2-Dichloroethane (EDC)	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Benzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Trichloroethene (TCE)	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2-Dichloropropane	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Bromodichloromethane	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Dibromomethane	ND	0.0293		mg/Kg-dry	1	10/13/2016 9:42:27 AM
cis-1,3-Dichloropropene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Toluene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
trans-1,3-Dichloropropylene	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,1,2-Trichloroethane	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,3-Dichloropropane	ND	0.0366		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Tetrachloroethene (PCE)	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Dibromochloromethane	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2-Dibromoethane (EDB)	ND	0.00366		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Chlorobenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,1,1,2-Tetrachloroethane	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Ethylbenzene	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
m,p-Xylene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
o-Xylene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Styrene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Isopropylbenzene	ND	0.0586		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Bromoform	ND	0.0147	Q	mg/Kg-dry	1	10/13/2016 9:42:27 AM



Client: GeoEngineers

Collection Date: 10/11/2016 3:55:00 PM

Project: Rufus Block 20

Lab ID: 1610175-001

Matrix: Soil

Client Sample ID: W6S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111

Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
n-Propylbenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Bromobenzene	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,3,5-Trimethylbenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
2-Chlorotoluene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
4-Chlorotoluene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
tert-Butylbenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2,3-Trichloropropane	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2,4-Trichlorobenzene	ND	0.0366		mg/Kg-dry	1	10/13/2016 9:42:27 AM
sec-Butylbenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
4-Isopropyltoluene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,3-Dichlorobenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,4-Dichlorobenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
n-Butylbenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2-Dichlorobenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2-Dibromo-3-chloropropane	ND	0.366		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2,4-Trimethylbenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Hexachlorobutadiene	ND	0.0733		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Naphthalene	ND	0.0220		mg/Kg-dry	1	10/13/2016 9:42:27 AM
1,2,3-Trichlorobenzene	ND	0.0147		mg/Kg-dry	1	10/13/2016 9:42:27 AM
Surr: Dibromofluoromethane	90.9	56.5-129		%Rec	1	10/13/2016 9:42:27 AM
Surr: Toluene-d8	101	64.3-131		%Rec	1	10/13/2016 9:42:27 AM
Surr: 1-Bromo-4-fluorobenzene	94.7	63.1-141		%Rec	1	10/13/2016 9:42:27 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15120

Analyst: MW

Mercury	ND	0.292		mg/Kg-dry	1	10/13/2016 3:02:44 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15108

Analyst: TN

Arsenic	6.63	0.0917		mg/Kg-dry	1	10/13/2016 1:50:09 PM
Barium	93.4	0.459		mg/Kg-dry	1	10/13/2016 1:50:09 PM
Cadmium	ND	0.183		mg/Kg-dry	1	10/13/2016 1:50:09 PM
Chromium	43.2	0.0917		mg/Kg-dry	1	10/13/2016 1:50:09 PM
Lead	3.88	0.183		mg/Kg-dry	1	10/13/2016 1:50:09 PM
Selenium	1.51	0.459		mg/Kg-dry	1	10/13/2016 1:50:09 PM



Client: GeoEngineers

Collection Date: 10/11/2016 3:55:00 PM

Project: Rufus Block 20

Lab ID: 1610175-001

Matrix: Soil

Client Sample ID: W6S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15108 Analyst: TN

Silver	ND	0.0917		mg/Kg-dry	1	10/13/2016 1:50:09 PM
--------	----	--------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32275 Analyst: BB

Percent Moisture	16.1			wt%	1	10/12/2016 2:44:20 PM
------------------	------	--	--	-----	---	-----------------------



Client: GeoEngineers

Collection Date: 10/11/2016 4:05:00 PM

Project: Rufus Block 20

Lab ID: 1610175-003

Matrix: Soil

Client Sample ID: W6S46-30

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15107

Analyst: WC

Diesel (Fuel Oil)	ND	24.7		mg/Kg-dry	1	10/13/2016 1:03:00 AM
Heavy Oil	ND	61.7		mg/Kg-dry	1	10/13/2016 1:03:00 AM
Surr: 2-Fluorobiphenyl	81.3	50-150		%Rec	1	10/13/2016 1:03:00 AM
Surr: o-Terphenyl	85.0	50-150		%Rec	1	10/13/2016 1:03:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15106

Analyst: BT

Naphthalene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
2-Methylnaphthalene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
1-Methylnaphthalene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Acenaphthylene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Acenaphthene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Fluorene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Phenanthrene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Anthracene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Fluoranthene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Pyrene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Benz(a)anthracene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Chrysene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Benzo(b)fluoranthene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Benzo(k)fluoranthene	ND	45.2	Q	µg/Kg-dry	1	10/13/2016 3:22:38 PM
Benzo(a)pyrene	ND	45.2		µg/Kg-dry	1	10/13/2016 3:22:38 PM
Indeno(1,2,3-cd)pyrene	ND	45.2	IQ	µg/Kg-dry	1	10/13/2016 3:22:38 PM
Dibenz(a,h)anthracene	ND	45.2	IQ	µg/Kg-dry	1	10/13/2016 3:22:38 PM
Benzo(g,h,i)perylene	ND	45.2	I	µg/Kg-dry	1	10/13/2016 3:22:38 PM
Surr: 2-Fluorobiphenyl	65.1	32.2-123		%Rec	1	10/13/2016 3:22:38 PM
Surr: Terphenyl-d14 (surr)	74.3	42.2-152		%Rec	1	10/13/2016 3:22:38 PM

NOTES:

I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Gasoline by NWTPH-Gx

Batch ID: 15111

Analyst: NG

Gasoline	ND	3.08		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Surr: Toluene-d8	100	65-135		%Rec	1	10/13/2016 10:43:30 AM
Surr: 4-Bromofluorobenzene	93.8	65-135		%Rec	1	10/13/2016 10:43:30 AM



Client: GeoEngineers

Collection Date: 10/11/2016 4:05:00 PM

Project: Rufus Block 20

Lab ID: 1610175-003

Matrix: Soil

Client Sample ID: W6S46-30

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111

Analyst: NG

Dichlorodifluoromethane (CFC-12)	ND	0.0370		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Chloromethane	ND	0.0370		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Vinyl chloride	ND	0.00123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Bromomethane	ND	0.0555		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Trichlorofluoromethane (CFC-11)	ND	0.0308		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Chloroethane	ND	0.0370		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,1-Dichloroethene	ND	0.0308		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Methylene chloride	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
trans-1,2-Dichloroethene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Methyl tert-butyl ether (MTBE)	ND	0.0308		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,1-Dichloroethane	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
2,2-Dichloropropane	ND	0.0308	Q	mg/Kg-dry	1	10/13/2016 10:43:30 AM
cis-1,2-Dichloroethene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Chloroform	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,1,1-Trichloroethane (TCA)	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,1-Dichloropropene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Carbon tetrachloride	ND	0.0123	Q	mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2-Dichloroethane (EDC)	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Benzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Trichloroethene (TCE)	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2-Dichloropropane	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Bromodichloromethane	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Dibromomethane	ND	0.0246		mg/Kg-dry	1	10/13/2016 10:43:30 AM
cis-1,3-Dichloropropene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Toluene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
trans-1,3-Dichloropropylene	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,1,2-Trichloroethane	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,3-Dichloropropane	ND	0.0308		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Tetrachloroethene (PCE)	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Dibromochloromethane	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2-Dibromoethane (EDB)	ND	0.00308		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Chlorobenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,1,1,2-Tetrachloroethane	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Ethylbenzene	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
m,p-Xylene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
o-Xylene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Styrene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Isopropylbenzene	ND	0.0493		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Bromoform	ND	0.0123	Q	mg/Kg-dry	1	10/13/2016 10:43:30 AM



Client: GeoEngineers

Collection Date: 10/11/2016 4:05:00 PM

Project: Rufus Block 20

Lab ID: 1610175-003

Matrix: Soil

Client Sample ID: W6S46-30

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111

Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
n-Propylbenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Bromobenzene	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,3,5-Trimethylbenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
2-Chlorotoluene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
4-Chlorotoluene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
tert-Butylbenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2,3-Trichloropropane	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2,4-Trichlorobenzene	ND	0.0308		mg/Kg-dry	1	10/13/2016 10:43:30 AM
sec-Butylbenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
4-Isopropyltoluene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,3-Dichlorobenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,4-Dichlorobenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
n-Butylbenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2-Dichlorobenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2-Dibromo-3-chloropropane	ND	0.308		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2,4-Trimethylbenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Hexachlorobutadiene	ND	0.0616		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Naphthalene	ND	0.0185		mg/Kg-dry	1	10/13/2016 10:43:30 AM
1,2,3-Trichlorobenzene	ND	0.0123		mg/Kg-dry	1	10/13/2016 10:43:30 AM
Surr: Dibromofluoromethane	91.0	56.5-129		%Rec	1	10/13/2016 10:43:30 AM
Surr: Toluene-d8	104	64.3-131		%Rec	1	10/13/2016 10:43:30 AM
Surr: 1-Bromo-4-fluorobenzene	92.7	63.1-141		%Rec	1	10/13/2016 10:43:30 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15120

Analyst: MW

Mercury	ND	0.313		mg/Kg-dry	1	10/13/2016 3:04:22 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15108

Analyst: TN

Arsenic	2.51	0.0962		mg/Kg-dry	1	10/13/2016 1:53:42 PM
Barium	65.1	0.481		mg/Kg-dry	1	10/13/2016 1:53:42 PM
Cadmium	ND	0.192		mg/Kg-dry	1	10/13/2016 1:53:42 PM
Chromium	39.3	0.0962		mg/Kg-dry	1	10/13/2016 1:53:42 PM
Lead	2.44	0.192		mg/Kg-dry	1	10/13/2016 1:53:42 PM
Selenium	1.21	0.481		mg/Kg-dry	1	10/13/2016 1:53:42 PM



Client: GeoEngineers

Collection Date: 10/11/2016 4:05:00 PM

Project: Rufus Block 20

Lab ID: 1610175-003

Matrix: Soil

Client Sample ID: W6S46-30

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15108 Analyst: TN

Silver	ND	0.0962		mg/Kg-dry	1	10/13/2016 1:53:42 PM
--------	----	--------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32275 Analyst: BB

Percent Moisture	20.0			wt%	1	10/12/2016 2:44:20 PM
------------------	------	--	--	-----	---	-----------------------



Client: GeoEngineers

Collection Date: 10/11/2016 4:50:00 PM

Project: Rufus Block 20

Lab ID: 1610175-006

Matrix: Soil

Client Sample ID: W9S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15107

Analyst: WC

Diesel (Fuel Oil)	ND	23.2		mg/Kg-dry	1	10/13/2016 4:41:00 AM
Heavy Oil	ND	58.1		mg/Kg-dry	1	10/13/2016 4:41:00 AM
Surr: 2-Fluorobiphenyl	92.7	50-150		%Rec	1	10/13/2016 4:41:00 AM
Surr: o-Terphenyl	93.8	50-150		%Rec	1	10/13/2016 4:41:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15106

Analyst: BT

Naphthalene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
2-Methylnaphthalene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
1-Methylnaphthalene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Acenaphthylene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Acenaphthene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Fluorene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Phenanthrene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Anthracene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Fluoranthene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Pyrene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Benz(a)anthracene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Chrysene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Benzo(b)fluoranthene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Benzo(k)fluoranthene	ND	43.1	Q	µg/Kg-dry	1	10/13/2016 3:43:53 PM
Benzo(a)pyrene	ND	43.1		µg/Kg-dry	1	10/13/2016 3:43:53 PM
Indeno(1,2,3-cd)pyrene	ND	43.1	IQ	µg/Kg-dry	1	10/13/2016 3:43:53 PM
Dibenz(a,h)anthracene	ND	43.1	IQ	µg/Kg-dry	1	10/13/2016 3:43:53 PM
Benzo(g,h,i)perylene	ND	43.1	I	µg/Kg-dry	1	10/13/2016 3:43:53 PM
Surr: 2-Fluorobiphenyl	60.8	32.2-123		%Rec	1	10/13/2016 3:43:53 PM
Surr: Terphenyl-d14 (surr)	73.8	42.2-152		%Rec	1	10/13/2016 3:43:53 PM

NOTES:

I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Gasoline by NWTPH-Gx

Batch ID: 15111

Analyst: NG

Gasoline	ND	3.34		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Surr: Toluene-d8	100	65-135		%Rec	1	10/13/2016 11:14:07 AM
Surr: 4-Bromofluorobenzene	97.7	65-135		%Rec	1	10/13/2016 11:14:07 AM



Client: GeoEngineers

Collection Date: 10/11/2016 4:50:00 PM

Project: Rufus Block 20

Lab ID: 1610175-006

Matrix: Soil

Client Sample ID: W9S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111

Analyst: NG

Dichlorodifluoromethane (CFC-12)	ND	0.0401		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Chloromethane	ND	0.0401		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Vinyl chloride	ND	0.00134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Bromomethane	ND	0.0601		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Trichlorofluoromethane (CFC-11)	ND	0.0334		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Chloroethane	ND	0.0401		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,1-Dichloroethene	ND	0.0334		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Methylene chloride	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
trans-1,2-Dichloroethene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Methyl tert-butyl ether (MTBE)	ND	0.0334		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,1-Dichloroethane	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
2,2-Dichloropropane	ND	0.0334	Q	mg/Kg-dry	1	10/13/2016 11:14:07 AM
cis-1,2-Dichloroethene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Chloroform	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,1,1-Trichloroethane (TCA)	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,1-Dichloropropene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Carbon tetrachloride	ND	0.0134	Q	mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2-Dichloroethane (EDC)	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Benzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Trichloroethene (TCE)	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2-Dichloropropane	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Bromodichloromethane	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Dibromomethane	ND	0.0267		mg/Kg-dry	1	10/13/2016 11:14:07 AM
cis-1,3-Dichloropropene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Toluene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
trans-1,3-Dichloropropylene	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,1,2-Trichloroethane	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,3-Dichloropropane	ND	0.0334		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Tetrachloroethene (PCE)	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Dibromochloromethane	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2-Dibromoethane (EDB)	ND	0.00334		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Chlorobenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,1,1,2-Tetrachloroethane	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Ethylbenzene	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
m,p-Xylene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
o-Xylene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Styrene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Isopropylbenzene	ND	0.0535		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Bromoform	ND	0.0134	Q	mg/Kg-dry	1	10/13/2016 11:14:07 AM



Client: GeoEngineers

Collection Date: 10/11/2016 4:50:00 PM

Project: Rufus Block 20

Lab ID: 1610175-006

Matrix: Soil

Client Sample ID: W9S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15111

Analyst: NG

1,1,2,2-Tetrachloroethane	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
n-Propylbenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Bromobenzene	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,3,5-Trimethylbenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
2-Chlorotoluene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
4-Chlorotoluene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
tert-Butylbenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2,3-Trichloropropane	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2,4-Trichlorobenzene	ND	0.0334		mg/Kg-dry	1	10/13/2016 11:14:07 AM
sec-Butylbenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
4-Isopropyltoluene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,3-Dichlorobenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,4-Dichlorobenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
n-Butylbenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2-Dichlorobenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2-Dibromo-3-chloropropane	ND	0.334		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2,4-Trimethylbenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Hexachlorobutadiene	ND	0.0668		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Naphthalene	ND	0.0200		mg/Kg-dry	1	10/13/2016 11:14:07 AM
1,2,3-Trichlorobenzene	ND	0.0134		mg/Kg-dry	1	10/13/2016 11:14:07 AM
Surr: Dibromofluoromethane	91.8	56.5-129		%Rec	1	10/13/2016 11:14:07 AM
Surr: Toluene-d8	99.6	64.3-131		%Rec	1	10/13/2016 11:14:07 AM
Surr: 1-Bromo-4-fluorobenzene	96.3	63.1-141		%Rec	1	10/13/2016 11:14:07 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15120

Analyst: MW

Mercury	ND	0.282		mg/Kg-dry	1	10/13/2016 3:05:58 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15108

Analyst: TN

Arsenic	9.23	0.0958		mg/Kg-dry	1	10/13/2016 1:57:14 PM
Barium	135	0.479		mg/Kg-dry	1	10/13/2016 1:57:14 PM
Cadmium	ND	0.192		mg/Kg-dry	1	10/13/2016 1:57:14 PM
Chromium	88.5	0.0958		mg/Kg-dry	1	10/13/2016 1:57:14 PM
Lead	9.24	0.192		mg/Kg-dry	1	10/13/2016 1:57:14 PM
Selenium	1.82	0.479		mg/Kg-dry	1	10/13/2016 1:57:14 PM



Client: GeoEngineers

Collection Date: 10/11/2016 4:50:00 PM

Project: Rufus Block 20

Lab ID: 1610175-006

Matrix: Soil

Client Sample ID: W9S46-15

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15108 Analyst: TN

Silver	ND	0.0958		mg/Kg-dry	1	10/13/2016 1:57:14 PM
--------	----	--------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32275 Analyst: BB

Percent Moisture	16.5			wt%	1	10/12/2016 2:44:20 PM
------------------	------	--	--	-----	---	-----------------------

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-15107	SampType: MBLK	Units: mg/Kg	Prep Date: 10/12/2016	RunNo: 32287							
Client ID: MBLKS	Batch ID: 15107		Analysis Date: 10/13/2016	SeqNo: 610595							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	19.5		20.00		97.6	50	150				
Surr: o-Terphenyl	19.1		20.00		95.5	50	150				

Sample ID LCS-15107	SampType: LCS	Units: mg/Kg	Prep Date: 10/12/2016	RunNo: 32287							
Client ID: LCSS	Batch ID: 15107		Analysis Date: 10/13/2016	SeqNo: 610594							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	483	20.0	500.0	0	96.7	65	135				
Surr: 2-Fluorobiphenyl	20.5		20.00		103	50	150				
Surr: o-Terphenyl	19.7		20.00		98.5	50	150				

Sample ID 1610175-003ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32287							
Client ID: W6S46-30	Batch ID: 15107		Analysis Date: 10/13/2016	SeqNo: 610582							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	24.6						0		30	
Heavy Oil	ND	61.6						0		30	
Surr: 2-Fluorobiphenyl	24.5		24.64		99.3	50	150		0		
Surr: o-Terphenyl	24.5		24.64		99.2	50	150		0		

Sample ID 1610175-003AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32287							
Client ID: W6S46-30	Batch ID: 15107		Analysis Date: 10/13/2016	SeqNo: 610583							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	573	23.8	595.0	0	96.4	65	135				
Surr: 2-Fluorobiphenyl	22.9		23.80		96.1	50	150				
Surr: o-Terphenyl	23.3		23.80		97.8	50	150				

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1610175-003AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32287							
Client ID: W6S46-30	Batch ID: 15107	Analysis Date: 10/13/2016	SeqNo: 610583								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID 1610175-003AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32287							
Client ID: W6S46-30	Batch ID: 15107	Analysis Date: 10/13/2016	SeqNo: 610584								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	577	22.7	566.9	0	102	65	135	573.4	0.683	30
Surr: 2-Fluorobiphenyl	24.0		22.68		106	50	150		0	
Surr: o-Terphenyl	23.6		22.68		104	50	150		0	

Sample ID 1610179-007ADUP	SampType: DUP	Units: mg/Kg	Prep Date: 10/12/2016	RunNo: 32287							
Client ID: BATCH	Batch ID: 15107	Analysis Date: 10/13/2016	SeqNo: 610826								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	19.3						0		30
Heavy Oil	ND	48.3						0		30
Surr: 2-Fluorobiphenyl	19.5		19.32		101	50	150		0	
Surr: o-Terphenyl	20.3		19.32		105	50	150		0	

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID	LCS-15111	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32293		
Client ID:	LCSS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610763		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	22.8	5.00	25.00	0	91.1	65	135				
Surr: Toluene-d8	1.28		1.250		102	65	135				
Surr: 4-Bromofluorobenzene	1.25		1.250		100	65	135				

Sample ID	MB-15111	SampType:	MBLK	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32293		
Client ID:	MBLKS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610764		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.25		1.250		100	65	135				
Surr: 4-Bromofluorobenzene	1.20		1.250		95.8	65	135				

Sample ID	1610175-001BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32293		
Client ID:	W6S46-15	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610758		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	3.66						0		30	
Surr: Toluene-d8	0.932		0.9157		102	65	135		0		
Surr: 4-Bromofluorobenzene	0.870		0.9157		95.1	65	135		0		

Sample ID	1610175-006BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32293		
Client ID:	W9S46-15	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610886		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	14.0	3.34	16.71	0	83.5	65	135				
Surr: Toluene-d8	0.819		0.8353		98.0	65	135				
Surr: 4-Bromofluorobenzene	0.845		0.8353		101	65	135				

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID	1610175-006BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32293
Client ID:	W9S46-15	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610887

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	10.3	3.34	16.71	0	61.6	65	135	13.96	30.2	30	RS
Surr: Toluene-d8	0.846		0.8353		101	65	135		0		
Surr: 4-Bromofluorobenzene	0.867		0.8353		104	65	135		0		

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.
 R - High RPD observed.

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID	MB-15120	SampType:	MBLK	Units:	mg/Kg	Prep Date:	10/13/2016	RunNo:	32297			
Client ID:	MBLKS	Batch ID:	15120			Analysis Date:	10/13/2016	SeqNo:	610922			
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID	LCS-15120	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/13/2016	RunNo:	32297			
Client ID:	LCSS	Batch ID:	15120			Analysis Date:	10/13/2016	SeqNo:	610923			
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.539 0.250 0.5000 0 108 80 120

Sample ID	1610162-001ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	10/13/2016	RunNo:	32297			
Client ID:	BATCH	Batch ID:	15120			Analysis Date:	10/13/2016	SeqNo:	610925			
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.259 0 20

Sample ID	1610162-001AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	10/13/2016	RunNo:	32297			
Client ID:	BATCH	Batch ID:	15120			Analysis Date:	10/13/2016	SeqNo:	610926			
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.599 0.275 0.5491 0.01680 106 70 130

Sample ID	1610162-001AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/13/2016	RunNo:	32297			
Client ID:	BATCH	Batch ID:	15120			Analysis Date:	10/13/2016	SeqNo:	610927			
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.592 0.269 0.5384 0.01680 107 70 130 0.5986 1.07 20

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: MB-15106	SampType: MBLK	Units: µg/Kg	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: MBLKS	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611006							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									Q
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									Q
Dibenz(a,h)anthracene	ND	40.0									Q
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	424		500.0		84.8	32.2	123				
Surr: Terphenyl-d14 (surr)	451		500.0		90.2	42.2	152				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID: LCS-15106	SampType: LCS	Units: µg/Kg	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: LCSS	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611007							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	864	40.0	1,000	0	86.4	46.4	125				
2-Methylnaphthalene	890	40.0	1,000	0	89.0	45.1	135				
1-Methylnaphthalene	858	40.0	1,000	0	85.8	46.2	133				
Acenaphthylene	923	40.0	1,000	0	92.3	32.8	136				

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: LCS-15106	SampType: LCS	Units: µg/Kg	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: LCSS	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611007							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	909	40.0	1,000	0	90.9	38.7	129				
Fluorene	864	40.0	1,000	0	86.4	41.1	132				
Phenanthrene	865	40.0	1,000	0	86.5	43.9	133				
Anthracene	922	40.0	1,000	0	92.2	44.2	136				
Fluoranthene	919	40.0	1,000	0	91.9	45.9	137				
Pyrene	913	40.0	1,000	0	91.3	46.2	137				
Benz(a)anthracene	808	40.0	1,000	0	80.8	41.9	136				
Chrysene	897	40.0	1,000	0	89.7	46.9	138				
Benzo(b)fluoranthene	818	40.0	1,000	0	81.8	35.9	148				
Benzo(k)fluoranthene	662	40.0	1,000	0	66.2	43.9	144				Q
Benzo(a)pyrene	652	40.0	1,000	0	65.2	36.3	144				
Indeno(1,2,3-cd)pyrene	509	40.0	1,000	0	50.9	41	140				Q
Dibenz(a,h)anthracene	391	40.0	1,000	0	39.1	33.8	133				Q
Benzo(g,h,i)perylene	655	40.0	1,000	0	65.5	32.9	112				
Surr: 2-Fluorobiphenyl	431		500.0		86.3	32.2	123				
Surr: Terphenyl-d14 (surr)	450		500.0		90.0	42.2	152				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID: 1610175-001ADUP	SampType: DUP	Units: µg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: W6S46-15	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611009							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	43.5						0		30	
2-Methylnaphthalene	ND	43.5						0		30	
1-Methylnaphthalene	ND	43.5						0		30	
Acenaphthylene	ND	43.5						0		30	
Acenaphthene	ND	43.5						0		30	
Fluorene	ND	43.5						0		30	
Phenanthrene	ND	43.5						0		30	
Anthracene	ND	43.5						0		30	

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	1610175-001ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32299		
Client ID:	W6S46-15	Batch ID:	15106			Analysis Date:	10/13/2016	SeqNo:	611009		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoranthene	ND	43.5						0		30	
Pyrene	ND	43.5						0		30	
Benz(a)anthracene	ND	43.5						0		30	
Chrysene	ND	43.5						0		30	
Benzo(b)fluoranthene	ND	43.5						0		30	
Benzo(k)fluoranthene	ND	43.5						0		30	Q
Benzo(a)pyrene	ND	43.5						0		30	
Indeno(1,2,3-cd)pyrene	ND	43.5						0		30	IQ
Dibenz(a,h)anthracene	ND	43.5						0		30	IQ
Benzo(g,h,i)perylene	ND	43.5						0		30	I
Surr: 2-Fluorobiphenyl	324		544.0		59.6	32.2	123		0		
Surr: Terphenyl-d14 (surr)	471		544.0		86.6	42.2	152		0		

NOTES:

I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID	1610175-001AMS	SampType:	MS	Units:	µg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32299		
Client ID:	W6S46-15	Batch ID:	15106			Analysis Date:	10/13/2016	SeqNo:	611010		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	752	40.0	999.5	0	75.2	42.9	138				
2-Methylnaphthalene	779	40.0	999.5	0	77.9	42.8	151				
1-Methylnaphthalene	751	40.0	999.5	0	75.1	41.6	148				
Acenaphthylene	810	40.0	999.5	0	81.0	32.6	160				
Acenaphthene	800	40.0	999.5	0	80.0	46.3	142				
Fluorene	758	40.0	999.5	0	75.8	43.4	153				
Phenanthrene	762	40.0	999.5	0	76.2	45.5	140				
Anthracene	806	40.0	999.5	0	80.7	32.6	160				
Fluoranthene	792	40.0	999.5	0	79.2	44.6	161				
Pyrene	791	40.0	999.5	0	79.1	48.3	158				
Benz(a)anthracene	683	40.0	999.5	0	68.4	57.5	169				

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	1610175-001AMS	SampType:	MS	Units:	µg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32299		
Client ID:	W6S46-15	Batch ID:	15106			Analysis Date:	10/13/2016	SeqNo:	611010		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chrysene	784	40.0	999.5	0	78.5	45.2	146				
Benzo(b)fluoranthene	647	40.0	999.5	0	64.8	42.2	168				
Benzo(k)fluoranthene	613	40.0	999.5	0	61.3	48	161				Q
Benzo(a)pyrene	569	40.0	999.5	0	56.9	34.4	179				
Indeno(1,2,3-cd)pyrene	430	40.0	999.5	7.735	42.3	41.1	165				Q
Dibenz(a,h)anthracene	340	40.0	999.5	10.21	33.0	38.1	166				SQ
Benzo(g,h,i)perylene	542	40.0	999.5	4.379	53.8	45.6	157				
Surr: 2-Fluorobiphenyl	368		499.7		73.6	32.2	123				
Surr: Terphenyl-d14 (surr)	397		499.7		79.5	42.2	152				

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.

Sample ID	1610175-001AMSD	SampType:	MSD	Units:	µg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32299		
Client ID:	W6S46-15	Batch ID:	15106			Analysis Date:	10/13/2016	SeqNo:	611011		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	893	46.7	1,168	0	76.5	42.9	138	751.7	17.2	30	
2-Methylnaphthalene	925	46.7	1,168	0	79.2	42.8	151	778.8	17.1	30	
1-Methylnaphthalene	890	46.7	1,168	0	76.2	41.6	148	750.6	17.1	30	
Acenaphthylene	960	46.7	1,168	0	82.2	32.6	160	809.9	16.9	30	
Acenaphthene	949	46.7	1,168	0	81.2	46.3	142	800.0	17.0	30	
Fluorene	895	46.7	1,168	0	76.7	43.4	153	757.5	16.7	30	
Phenanthrene	898	46.7	1,168	0	76.9	45.5	140	762.1	16.4	30	
Anthracene	954	46.7	1,168	0	81.7	32.6	160	806.4	16.8	30	
Fluoranthene	938	46.7	1,168	0	80.3	44.6	161	791.8	16.9	30	
Pyrene	932	46.7	1,168	0	79.8	48.3	158	790.7	16.4	30	
Benz(a)anthracene	819	46.7	1,168	0	70.1	57.5	169	683.4	18.0	30	
Chrysene	934	46.7	1,168	0	80.0	45.2	146	784.3	17.5	30	
Benzo(b)fluoranthene	827	46.7	1,168	0	70.9	42.2	168	647.3	24.4	30	
Benzo(k)fluoranthene	697	46.7	1,168	0	59.7	48	161	612.6	12.9	30	Q

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1610175-001AMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32299							
Client ID: W6S46-15	Batch ID: 15106		Analysis Date: 10/13/2016	SeqNo: 611011							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(a)pyrene	657	46.7	1,168	0	56.3	34.4	179	569.1	14.3	30	
Indeno(1,2,3-cd)pyrene	533	46.7	1,168	7.735	45.0	41.1	165	430.5	21.3	30	Q
Dibenz(a,h)anthracene	456	46.7	1,168	10.21	38.2	38.1	166	340.0	29.2	30	Q
Benzo(g,h,i)perylene	684	46.7	1,168	4.379	58.2	45.6	157	541.7	23.2	30	
Surr: 2-Fluorobiphenyl	417		583.9		71.4	32.2	123		0		
Surr: Terphenyl-d14 (surr)	467		583.9		80.0	42.2	152		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF). The LCS recovered within range.



Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID 1610175-006ADUP	SampType: DUP	Units: wt%	Prep Date: 10/12/2016	RunNo: 32275							
Client ID: W9S46-15	Batch ID: R32275	Analysis Date: 10/12/2016	SeqNo: 610305								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	16.7	0.500						16.46	1.25	20	

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-15108	SampType: MBLK	Units: mg/Kg	Prep Date: 10/12/2016	RunNo: 32296							
Client ID: MBLKS	Batch ID: 15108		Analysis Date: 10/13/2016	SeqNo: 610851							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.0781									
Barium	ND	0.391									
Cadmium	ND	0.156									
Chromium	ND	0.0781									
Lead	ND	0.156									
Selenium	ND	0.391									
Silver	ND	0.0781									

Sample ID LCS-15108	SampType: LCS	Units: mg/Kg	Prep Date: 10/12/2016	RunNo: 32296							
Client ID: LCSS	Batch ID: 15108		Analysis Date: 10/13/2016	SeqNo: 610852							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	36.8	0.0781	39.06	0	94.3	80	120				
Barium	39.1	0.391	39.06	0	100	80	120				
Cadmium	1.93	0.156	1.953	0	98.8	80	120				
Chromium	38.4	0.0781	39.06	0	98.3	80	120				
Lead	19.4	0.156	19.53	0	99.6	80	120				
Selenium	3.51	0.391	3.906	0	89.9	80	120				
Silver	1.59	0.0781	1.953	0	81.4	80	120				

Sample ID 1610174-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32296							
Client ID: BATCH	Batch ID: 15108		Analysis Date: 10/13/2016	SeqNo: 610854							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	5.47	0.0893						5.100	7.05	20	
Barium	93.9	0.446						84.31	10.7	20	
Cadmium	ND	0.179						0		20	
Chromium	39.1	0.0893						35.82	8.87	20	
Lead	11.0	0.179						9.040	19.1	20	
Selenium	1.41	0.446						1.385	1.61	20	

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1610174-001ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32296					
Client ID: BATCH	Batch ID: 15108				Analysis Date: 10/13/2016	SeqNo: 610854					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Silver	ND	0.0893						0		20	

Sample ID 1610174-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32296					
Client ID: BATCH	Batch ID: 15108				Analysis Date: 10/13/2016	SeqNo: 610856					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	47.7	0.0886	44.32	5.100	96.2	75	125				
Barium	147	0.443	44.32	84.31	142	75	125				S
Cadmium	2.16	0.177	2.216	0.09826	93.0	75	125				
Chromium	89.5	0.0886	44.32	35.82	121	75	125				
Lead	36.5	0.177	22.16	9.040	124	75	125				
Selenium	5.22	0.443	4.432	1.385	86.5	75	125				
Silver	1.20	0.0886	2.216	0.04011	52.4	75	125				S

NOTES:

S - Outlying spike recovery(ies) observed for Barium and Silver. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1610174-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 10/12/2016	RunNo: 32296					
Client ID: BATCH	Batch ID: 15108				Analysis Date: 10/13/2016	SeqNo: 610857					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.1	0.0886	44.32	5.100	99.3	75	125	47.74	2.80	20	
Barium	143	0.443	44.32	84.31	132	75	125	147.2	3.17	20	S
Cadmium	2.13	0.177	2.216	0.09826	91.6	75	125	2.158	1.45	20	
Chromium	90.2	0.0886	44.32	35.82	123	75	125	89.49	0.779	20	
Lead	40.7	0.177	22.16	9.040	143	75	125	36.50	10.9	20	S
Selenium	5.48	0.443	4.432	1.385	92.3	75	125	5.217	4.83	20	
Silver	1.20	0.0886	2.216	0.04011	52.5	75	125	1.201	0.184	20	S

NOTES:

S - Outlying spike recovery(ies) observed for Barium and Silver. A duplicate analysis was performed with similar results indicating a possible matrix effect.

S - Outlying spike recovery(ies) observed for Lead. A duplicate analysis was performed and recovered within range.

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	1610174-001APDS	SampType:	PDS	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32296
Client ID:	BATCH	Batch ID:	15108	Analysis Date:	10/13/2016	SeqNo:	610858		

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	129	0.450	45.0	84.3	98.7	80	120				
Silver	1.22	0.0899	2.25	0.0401	52.7	80	120				S

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15111	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	LCSS	Batch ID:	15111	Analysis Date:	10/12/2016	SeqNo:	610736				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	1.34	0.0600	1.000	0	134	34.5	141				
Chloromethane	0.993	0.0600	1.000	0	99.3	38.8	132				
Vinyl chloride	0.925	0.00200	1.000	0	92.5	44	142				
Bromomethane	0.910	0.0900	1.000	0	91.0	40.9	157				
Trichlorofluoromethane (CFC-11)	0.833	0.0500	1.000	0	83.3	42.9	147				
Chloroethane	0.876	0.0600	1.000	0	87.6	37.1	144				
1,1-Dichloroethene	0.939	0.0500	1.000	0	93.9	49.7	142				
Methylene chloride	1.05	0.0200	1.000	0	105	46.3	140				
trans-1,2-Dichloroethene	1.06	0.0200	1.000	0	106	68	130				
Methyl tert-butyl ether (MTBE)	1.02	0.0500	1.000	0	102	59.1	138				
1,1-Dichloroethane	0.977	0.0200	1.000	0	97.7	61.9	137				
2,2-Dichloropropane	0.798	0.0500	1.000	0	79.8	28.1	149				Q
cis-1,2-Dichloroethene	0.981	0.0200	1.000	0	98.1	71.3	135				
Chloroform	1.16	0.0200	1.000	0	116	67.5	129				
1,1,1-Trichloroethane (TCA)	0.982	0.0200	1.000	0	98.2	69	132				
1,1-Dichloropropene	0.963	0.0200	1.000	0	96.3	72.7	131				
Carbon tetrachloride	0.849	0.0200	1.000	0	84.9	63.4	137				Q
1,2-Dichloroethane (EDC)	1.00	0.0300	1.000	0	100	61.9	136				
Benzene	1.01	0.0200	1.000	0	101	64.3	133				
Trichloroethene (TCE)	1.01	0.0200	1.000	0	101	65.5	137				
1,2-Dichloropropane	1.02	0.0200	1.000	0	102	63.2	142				
Bromodichloromethane	0.970	0.0200	1.000	0	97.0	73.2	131				
Dibromomethane	0.990	0.0400	1.000	0	99.0	70	130				
cis-1,3-Dichloropropene	0.951	0.0200	1.000	0	95.1	59.1	143				
Toluene	0.992	0.0200	1.000	0	99.2	67.3	138				
trans-1,3-Dichloropropylene	0.921	0.0300	1.000	0	92.1	49.2	149				
1,1,2-Trichloroethane	0.985	0.0300	1.000	0	98.5	74.5	129				
1,3-Dichloropropane	0.973	0.0500	1.000	0	97.3	70	130				
Tetrachloroethene (PCE)	0.980	0.0200	1.000	0	98.0	52.7	150				
Dibromochloromethane	0.936	0.0300	1.000	0	93.6	70.6	144				
1,2-Dibromoethane (EDB)	0.979	0.00500	1.000	0	97.9	70	130				



Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15111	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292
Client ID:	LCSS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610736

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	0.924	0.0200	1.000	0	92.4	76.1	123				
1,1,1,2-Tetrachloroethane	0.968	0.0300	1.000	0	96.8	65.9	141				
Ethylbenzene	0.967	0.0300	1.000	0	96.7	74	129				
m,p-Xylene	1.96	0.0200	2.000	0	98.0	70	124				
o-Xylene	0.967	0.0200	1.000	0	96.7	72.7	124				
Styrene	0.971	0.0200	1.000	0	97.1	76.8	130				
Isopropylbenzene	0.958	0.0800	1.000	0	95.8	70	130				
Bromoform	0.909	0.0200	1.000	0	90.9	67	154				Q
1,1,2,2-Tetrachloroethane	0.924	0.0200	1.000	0	92.4	60	130				
n-Propylbenzene	0.973	0.0200	1.000	0	97.3	74.8	125				
Bromobenzene	0.993	0.0300	1.000	0	99.3	49.2	144				
1,3,5-Trimethylbenzene	0.975	0.0200	1.000	0	97.5	74.6	123				
2-Chlorotoluene	0.980	0.0200	1.000	0	98.0	76.7	129				
4-Chlorotoluene	0.963	0.0200	1.000	0	96.3	77.5	125				
tert-Butylbenzene	0.968	0.0200	1.000	0	96.8	66.2	130				
1,2,3-Trichloropropane	1.03	0.0200	1.000	0	103	67.9	136				
1,2,4-Trichlorobenzene	0.976	0.0500	1.000	0	97.6	62.6	143				
sec-Butylbenzene	0.951	0.0200	1.000	0	95.1	75.6	133				
4-Isopropyltoluene	0.970	0.0200	1.000	0	97.0	76.8	131				
1,3-Dichlorobenzene	1.02	0.0200	1.000	0	102	72.8	128				
1,4-Dichlorobenzene	1.07	0.0200	1.000	0	107	72.6	126				
n-Butylbenzene	0.972	0.0200	1.000	0	97.2	65.3	136				
1,2-Dichlorobenzene	1.03	0.0200	1.000	0	103	72.8	126				
1,2-Dibromo-3-chloropropane	0.953	0.500	1.000	0	95.3	61.2	139				
1,2,4-Trimethylbenzene	0.970	0.0200	1.000	0	97.0	77.5	129				
Hexachlorobutadiene	0.995	0.100	1.000	0	99.5	42	151				
Naphthalene	0.947	0.0300	1.000	0	94.7	62.3	134				
1,2,3-Trichlorobenzene	0.961	0.0200	1.000	0	96.1	54.8	143				
Surr: Dibromofluoromethane	1.28		1.250		102	56.5	129				
Surr: Toluene-d8	1.36		1.250		109	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.31		1.250		105	63.1	141				

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15111	SampType:	LCS	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292				
Client ID:	LCSS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610736				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	MB-15111	SampType:	MBLK	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292				
Client ID:	MBLKS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610737				
Analyte		Result		RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0600											
Chloromethane	ND	0.0600											
Vinyl chloride	ND	0.00200											
Bromomethane	ND	0.0900											
Trichlorofluoromethane (CFC-11)	ND	0.0500											
Chloroethane	ND	0.0600											
1,1-Dichloroethene	ND	0.0500											
Methylene chloride	ND	0.0200											
trans-1,2-Dichloroethene	ND	0.0200											
Methyl tert-butyl ether (MTBE)	ND	0.0500											
1,1-Dichloroethane	ND	0.0200											
2,2-Dichloropropane	ND	0.0500											Q
cis-1,2-Dichloroethene	ND	0.0200											
Chloroform	ND	0.0200											
1,1,1-Trichloroethane (TCA)	ND	0.0200											
1,1-Dichloropropene	ND	0.0200											
Carbon tetrachloride	ND	0.0200											Q
1,2-Dichloroethane (EDC)	ND	0.0300											
Benzene	ND	0.0200											
Trichloroethene (TCE)	ND	0.0200											
1,2-Dichloropropane	ND	0.0200											
Bromodichloromethane	ND	0.0200											
Dibromomethane	ND	0.0400											
cis-1,3-Dichloropropene	ND	0.0200											

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: MB-15111	SampType: MBLK	Units: mg/Kg	Prep Date: 10/12/2016	RunNo: 32292
Client ID: MBLKS	Batch ID: 15111		Analysis Date: 10/12/2016	SeqNo: 610737

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									Q
1,1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									
tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									
sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									
1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									
1,2-Dichlorobenzene	ND	0.0200									
1,2-Dibromo-3-chloropropane	ND	0.500									

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	MB-15111	SampType:	MBLK	Units:	mg/Kg	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	MBLKS	Batch ID:	15111			Analysis Date:	10/12/2016	SeqNo:	610737		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.24		1.250		99.0	56.5	129				
Surr: Toluene-d8	1.23		1.250		98.7	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.18		1.250		94.5	63.1	141				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	1610175-001BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	W6S46-15	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610730		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0440						0		30	
Chloromethane	ND	0.0440						0		30	
Vinyl chloride	ND	0.00147						0		30	
Bromomethane	ND	0.0659						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0366						0		30	
Chloroethane	ND	0.0440						0		30	
1,1-Dichloroethene	ND	0.0366						0		30	
Methylene chloride	ND	0.0147						0		30	
trans-1,2-Dichloroethene	ND	0.0147						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0366						0		30	
1,1-Dichloroethane	ND	0.0147						0		30	
2,2-Dichloropropane	ND	0.0366						0		30	Q
cis-1,2-Dichloroethene	ND	0.0147						0		30	
Chloroform	ND	0.0147						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0147						0		30	
1,1-Dichloropropene	ND	0.0147						0		30	
Carbon tetrachloride	ND	0.0147						0		30	Q

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610175-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292
Client ID: W6S46-15	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610730

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dichloroethane (EDC)	ND	0.0220						0		30	
Benzene	ND	0.0147						0		30	
Trichloroethene (TCE)	ND	0.0147						0		30	
1,2-Dichloropropane	ND	0.0147						0		30	
Bromodichloromethane	ND	0.0147						0		30	
Dibromomethane	ND	0.0293						0		30	
cis-1,3-Dichloropropene	ND	0.0147						0		30	
Toluene	ND	0.0147						0		30	
trans-1,3-Dichloropropylene	ND	0.0220						0		30	
1,1,2-Trichloroethane	ND	0.0220						0		30	
1,3-Dichloropropane	ND	0.0366						0		30	
Tetrachloroethene (PCE)	ND	0.0147						0		30	
Dibromochloromethane	ND	0.0220						0		30	
1,2-Dibromoethane (EDB)	ND	0.00366						0		30	
Chlorobenzene	ND	0.0147						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0220						0		30	
Ethylbenzene	ND	0.0220						0		30	
m,p-Xylene	ND	0.0147						0		30	
o-Xylene	ND	0.0147						0		30	
Styrene	ND	0.0147						0		30	
Isopropylbenzene	ND	0.0586						0		30	
Bromoform	ND	0.0147						0		30	Q
1,1,2,2-Tetrachloroethane	ND	0.0147						0		30	
n-Propylbenzene	ND	0.0147						0		30	
Bromobenzene	ND	0.0220						0		30	
1,3,5-Trimethylbenzene	ND	0.0147						0		30	
2-Chlorotoluene	ND	0.0147						0		30	
4-Chlorotoluene	ND	0.0147						0		30	
tert-Butylbenzene	ND	0.0147						0		30	
1,2,3-Trichloropropane	ND	0.0147						0		30	
1,2,4-Trichlorobenzene	ND	0.0366						0		30	

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1610175-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292							
Client ID: W6S46-15	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610730							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

sec-Butylbenzene	ND	0.0147						0		30	
4-Isopropyltoluene	ND	0.0147						0		30	
1,3-Dichlorobenzene	ND	0.0147						0		30	
1,4-Dichlorobenzene	ND	0.0147						0		30	
n-Butylbenzene	ND	0.0147						0		30	
1,2-Dichlorobenzene	ND	0.0147						0		30	
1,2-Dibromo-3-chloropropane	ND	0.366						0		30	
1,2,4-Trimethylbenzene	ND	0.0147						0		30	
Hexachlorobutadiene	ND	0.0733						0		30	
Naphthalene	ND	0.0220						0		30	
1,2,3-Trichlorobenzene	ND	0.0147						0		30	
Surr: Dibromofluoromethane	0.835		0.9157		91.2	56.5	129		0		
Surr: Toluene-d8	0.952		0.9157		104	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.865		0.9157		94.4	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1610175-003BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292							
Client ID: W6S46-30	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610732							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.406	0.0370	0.6161	0	65.9	43.5	121				
Chloromethane	0.704	0.0370	0.6161	0	114	45	130				
Vinyl chloride	0.599	0.00123	0.6161	0	97.2	51.2	146				
Bromomethane	0.756	0.0555	0.6161	0	123	21.3	120				S
Trichlorofluoromethane (CFC-11)	1.15	0.0308	0.6161	0	187	35	131				S
Chloroethane	0.825	0.0370	0.6161	0	134	43.8	117				S
1,1-Dichloroethene	0.765	0.0308	0.6161	0	124	61.9	141				
Methylene chloride	0.646	0.0123	0.6161	0	105	54.7	142				
trans-1,2-Dichloroethene	0.661	0.0123	0.6161	0	107	52	136				
Methyl tert-butyl ether (MTBE)	0.614	0.0308	0.6161	0	99.7	54.4	132				

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610175-003BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292
Client ID: W6S46-30	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610732

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethane	0.622	0.0123	0.6161	0	101	51.8	141				
2,2-Dichloropropane	0.312	0.0308	0.6161	0	50.7	36	123				Q
cis-1,2-Dichloroethane	0.615	0.0123	0.6161	0	99.8	58.6	136				
Chloroform	0.636	0.0123	0.6161	0.002069	103	53.2	129				
1,1,1-Trichloroethane (TCA)	0.611	0.0123	0.6161	0	99.2	58.3	145				
1,1-Dichloropropene	0.640	0.0123	0.6161	0	104	55.1	138				
Carbon tetrachloride	0.552	0.0123	0.6161	0	89.5	53.3	144				Q
1,2-Dichloroethane (EDC)	0.620	0.0185	0.6161	0	101	51.3	139				
Benzene	0.644	0.0123	0.6161	0	104	63.5	133				
Trichloroethene (TCE)	0.665	0.0123	0.6161	0	108	68.6	132				
1,2-Dichloropropane	0.644	0.0123	0.6161	0	104	59	136				
Bromodichloromethane	0.577	0.0123	0.6161	0	93.6	50.7	141				
Dibromomethane	0.644	0.0246	0.6161	0	105	50.6	137				
cis-1,3-Dichloropropene	0.546	0.0123	0.6161	0	88.7	50.4	138				
Toluene	0.653	0.0123	0.6161	0.007079	105	63.4	132				
trans-1,3-Dichloropropylene	0.532	0.0185	0.6161	0	86.4	44.1	147				
1,1,2-Trichloroethane	0.631	0.0185	0.6161	0	102	51.6	137				
1,3-Dichloropropane	0.639	0.0308	0.6161	0	104	53.1	134				
Tetrachloroethene (PCE)	0.671	0.0123	0.6161	0	109	35.6	158				
Dibromochloromethane	0.562	0.0185	0.6161	0	91.2	55.3	140				
1,2-Dibromoethane (EDB)	0.606	0.00308	0.6161	0	98.4	50.4	136				
Chlorobenzene	0.610	0.0123	0.6161	0	98.9	60	133				
1,1,1,2-Tetrachloroethane	0.599	0.0185	0.6161	0	97.2	53.1	142				
Ethylbenzene	0.629	0.0185	0.6161	0	102	54.5	134				
m,p-Xylene	1.25	0.0123	1.232	0	102	53.1	132				
o-Xylene	0.614	0.0123	0.6161	0	99.6	53.3	139				
Styrene	0.618	0.0123	0.6161	0	100	51.1	132				
Isopropylbenzene	0.627	0.0493	0.6161	0	102	58.9	138				
Bromoform	0.529	0.0123	0.6161	0	85.8	57.9	130				Q
1,1,2,2-Tetrachloroethane	0.563	0.0123	0.6161	0	91.4	51.9	131				
n-Propylbenzene	0.636	0.0123	0.6161	0	103	53.6	140				

Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1610175-003BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292			
Client ID:	W6S46-30	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610732			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Bromobenzene	0.632	0.0185	0.6161	0	102	54.2	140					
1,3,5-Trimethylbenzene	0.627	0.0123	0.6161	0	102	51.8	136					
2-Chlorotoluene	0.621	0.0123	0.6161	0	101	51.6	136					
4-Chlorotoluene	0.641	0.0123	0.6161	0	104	50.1	139					
tert-Butylbenzene	0.634	0.0123	0.6161	0	103	50.5	135					
1,2,3-Trichloropropane	0.592	0.0123	0.6161	0	96.0	50.5	131					
1,2,4-Trichlorobenzene	0.734	0.0308	0.6161	0	119	50.8	130					
sec-Butylbenzene	0.636	0.0123	0.6161	0	103	52.6	141					
4-Isopropyltoluene	0.631	0.0123	0.6161	0	102	52.9	134					
1,3-Dichlorobenzene	0.653	0.0123	0.6161	0	106	52.6	131					
1,4-Dichlorobenzene	0.661	0.0123	0.6161	0	107	52.9	129					
n-Butylbenzene	0.674	0.0123	0.6161	0	109	52.6	130					
1,2-Dichlorobenzene	0.651	0.0123	0.6161	0	106	55.8	129					
1,2-Dibromo-3-chloropropane	0.571	0.308	0.6161	0	92.7	40.5	131					
1,2,4-Trimethylbenzene	0.618	0.0123	0.6161	0	100	50.6	137					
Hexachlorobutadiene	0.685	0.0616	0.6161	0	111	40.6	158					
Naphthalene	0.710	0.0185	0.6161	0	115	52.3	124					
1,2,3-Trichlorobenzene	0.749	0.0123	0.6161	0	122	54.4	124					
Surr: Dibromofluoromethane	0.756		0.7702		98.2	56.5	129					
Surr: Toluene-d8	0.867		0.7702		113	64.3	131					
Surr: 1-Bromo-4-fluorobenzene	0.843		0.7702		109	63.1	141					

NOTES:

- S - Outlying spike recovery(ies) observed. The method is in control as indicated by the Laboratory Control Sample (LCS).
- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	1610175-003BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292			
Client ID:	W6S46-30	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610876			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Dichlorodifluoromethane (CFC-12)	0.353	0.0370	0.6161	0	57.4	43.5	121	0.4062	13.9	30		
Chloromethane	0.760	0.0370	0.6161	0	123	45	130	0.7044	7.58	30		

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610175-003BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292
Client ID: W6S46-30	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610876

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	0.560	0.00123	0.6161	0	90.8	51.2	146	0.5990	6.80	30	
Bromomethane	0.713	0.0555	0.6161	0	116	21.3	120	0.7556	5.79	30	
Trichlorofluoromethane (CFC-11)	1.15	0.0308	0.6161	0	186	35	131	1.150	0.161	30	S
Chloroethane	0.711	0.0370	0.6161	0	115	43.8	117	0.8252	14.9	30	
1,1-Dichloroethene	0.786	0.0308	0.6161	0	128	61.9	141	0.7645	2.77	30	
Methylene chloride	0.715	0.0123	0.6161	0	116	54.7	142	0.6458	10.2	30	
trans-1,2-Dichloroethene	0.718	0.0123	0.6161	0	116	52	136	0.6609	8.24	30	
Methyl tert-butyl ether (MTBE)	0.694	0.0308	0.6161	0	113	54.4	132	0.6144	12.2	30	
1,1-Dichloroethane	0.574	0.0123	0.6161	0	93.2	51.8	141	0.6221	7.98	30	
2,2-Dichloropropane	0.292	0.0308	0.6161	0	47.3	36	123	0.3124	6.90	30	Q
cis-1,2-Dichloroethene	0.578	0.0123	0.6161	0	93.8	58.6	136	0.6146	6.14	30	
Chloroform	0.616	0.0123	0.6161	0.002069	99.7	53.2	129	0.6362	3.17	30	
1,1,1-Trichloroethane (TCA)	0.581	0.0123	0.6161	0	94.3	58.3	145	0.6114	5.05	30	
1,1-Dichloropropene	0.587	0.0123	0.6161	0	95.3	55.1	138	0.6397	8.54	30	
Carbon tetrachloride	0.540	0.0123	0.6161	0	87.7	53.3	144	0.5516	2.06	30	Q
1,2-Dichloroethane (EDC)	0.567	0.0185	0.6161	0	92.1	51.3	139	0.6197	8.85	30	
Benzene	0.616	0.0123	0.6161	0	100	63.5	133	0.6436	4.41	30	
Trichloroethene (TCE)	0.621	0.0123	0.6161	0	101	68.6	132	0.6649	6.81	30	
1,2-Dichloropropane	0.590	0.0123	0.6161	0	95.7	59	136	0.6438	8.76	30	
Bromodichloromethane	0.552	0.0123	0.6161	0	89.6	50.7	141	0.5765	4.33	30	
Dibromomethane	0.584	0.0246	0.6161	0	94.8	50.6	137	0.6444	9.84	30	
cis-1,3-Dichloropropene	0.499	0.0123	0.6161	0	81.1	50.4	138	0.5464	8.98	30	
Toluene	0.608	0.0123	0.6161	0.007079	97.5	63.4	132	0.6529	7.19	30	
trans-1,3-Dichloropropylene	0.529	0.0185	0.6161	0	85.9	44.1	147	0.5322	0.560	30	
1,1,2-Trichloroethane	0.584	0.0185	0.6161	0	94.7	51.6	137	0.6314	7.88	30	
1,3-Dichloropropane	0.606	0.0308	0.6161	0	98.4	53.1	134	0.6394	5.34	30	
Tetrachloroethene (PCE)	0.609	0.0123	0.6161	0	98.8	35.6	158	0.6707	9.64	30	
Dibromochloromethane	0.521	0.0185	0.6161	0	84.6	55.3	140	0.5617	7.52	30	
1,2-Dibromoethane (EDB)	0.603	0.00308	0.6161	0	97.9	50.4	136	0.6065	0.496	30	
Chlorobenzene	0.583	0.0123	0.6161	0	94.7	60	133	0.6095	4.40	30	
1,1,1,2-Tetrachloroethane	0.560	0.0185	0.6161	0	90.8	53.1	142	0.5990	6.82	30	

Work Order: 1610175
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1610175-003BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 10/12/2016	RunNo: 32292
Client ID: W6S46-30	Batch ID: 15111		Analysis Date: 10/13/2016	SeqNo: 610876

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ethylbenzene	0.596	0.0185	0.6161	0	96.8	54.5	134	0.6289	5.31	30	
m,p-Xylene	1.17	0.0123	1.232	0	94.7	53.1	132	1.254	7.20	30	
o-Xylene	0.600	0.0123	0.6161	0	97.4	53.3	139	0.6138	2.24	30	
Styrene	0.607	0.0123	0.6161	0	98.6	51.1	132	0.6177	1.72	30	
Isopropylbenzene	0.587	0.0493	0.6161	0	95.4	58.9	138	0.6271	6.52	30	
Bromoform	0.496	0.0123	0.6161	0	80.5	57.9	130	0.5287	6.38	30	Q
1,1,2,2-Tetrachloroethane	0.556	0.0123	0.6161	0	90.3	51.9	131	0.5634	1.27	30	
n-Propylbenzene	0.603	0.0123	0.6161	0	97.9	53.6	140	0.6364	5.34	30	
Bromobenzene	0.600	0.0185	0.6161	0	97.5	54.2	140	0.6315	5.04	30	
1,3,5-Trimethylbenzene	0.587	0.0123	0.6161	0	95.3	51.8	136	0.6273	6.60	30	
2-Chlorotoluene	0.588	0.0123	0.6161	0	95.5	51.6	136	0.6213	5.47	30	
4-Chlorotoluene	0.605	0.0123	0.6161	0	98.1	50.1	139	0.6409	5.83	30	
tert-Butylbenzene	0.599	0.0123	0.6161	0	97.1	50.5	135	0.6341	5.78	30	
1,2,3-Trichloropropane	0.563	0.0123	0.6161	0	91.5	50.5	131	0.5916	4.87	30	
1,2,4-Trichlorobenzene	0.780	0.0308	0.6161	0	127	50.8	130	0.7337	6.05	30	
sec-Butylbenzene	0.594	0.0123	0.6161	0	96.5	52.6	141	0.6362	6.79	30	
4-Isopropyltoluene	0.588	0.0123	0.6161	0	95.5	52.9	134	0.6313	7.08	30	
1,3-Dichlorobenzene	0.666	0.0123	0.6161	0	108	52.6	131	0.6526	2.01	30	
1,4-Dichlorobenzene	0.677	0.0123	0.6161	0	110	52.9	129	0.6614	2.32	30	
n-Butylbenzene	0.667	0.0123	0.6161	0	108	52.6	130	0.6738	1.05	30	
1,2-Dichlorobenzene	0.673	0.0123	0.6161	0	109	55.8	129	0.6515	3.20	30	
1,2-Dibromo-3-chloropropane	0.574	0.308	0.6161	0	93.2	40.5	131	0.5711	0.536	30	
1,2,4-Trimethylbenzene	0.593	0.0123	0.6161	0	96.3	50.6	137	0.6176	3.98	30	
Hexachlorobutadiene	0.730	0.0616	0.6161	0	118	40.6	158	0.6847	6.41	30	
Naphthalene	0.791	0.0185	0.6161	0	128	52.3	124	0.7096	10.9	30	S
1,2,3-Trichlorobenzene	0.815	0.0123	0.6161	0	132	54.4	124	0.7490	8.40	30	S
Surr: Dibromofluoromethane	0.715		0.7702		92.8	56.5	129		0		
Surr: Toluene-d8	0.823		0.7702		107	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.820		0.7702		106	63.1	141		0		



Work Order: 1610175
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1610175-003BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	10/12/2016	RunNo:	32292		
Client ID:	W6S46-30	Batch ID:	15111			Analysis Date:	10/13/2016	SeqNo:	610876		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

- S - Outlying spike recovery(ies) observed. The method is in control as indicated by the Laboratory Control Sample (LCS).
- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Client Name: GEI	Work Order Number: 1610175
Logged by: Clare Griggs	Date Received: 10/12/2016 8:55:00 AM

Chain of Custody

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

Log In

3. Coolers are present? Yes No NA
4. Shipping container/cooler in good condition? Yes No
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes No Not Required
6. Was an attempt made to cool the samples? Yes No NA
7. Were all items received at a temperature of >0°C to 10.0°C * Yes No NA
8. Sample(s) in proper container(s)? Yes No
9. Sufficient sample volume for indicated test(s)? Yes No
10. Are samples properly preserved? Yes No
11. Was preservative added to bottles? Yes No NA
12. Is there headspace in the VOA vials? Yes No NA
13. Did all samples containers arrive in good condition(unbroken)? Yes No
14. Does paperwork match bottle labels? Yes No
15. Are matrices correctly identified on Chain of Custody? Yes No
16. Is it clear what analyses were requested? Yes No
17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

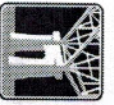
Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	6.6
Sample	3.3

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



Fremont

3600 Fremont Ave N.
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record and Laboratory Services Agreement

Date: 6-17-16

Laboratory Project No (Internal): 1610175

Page: 1 of 1

Client: Geo Engineers

Project Name: Rufus Black 20

Project No: 20134-001-24

Address: 600 Stewart St, Suite 1700

Location: Seattle, WA

Collected by: Sydney Bronson

City, State, Zip: Seattle, WA

Report To (PM): Chris Brown

PM Email: cbrown@geoengineers.com

Telephone: _____ Fax: _____

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

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Sample Analysis											Comments			
				VOCS (EPA 8260 / 624)	GW/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DIX)	SVOCS (EPA 8270 / 635)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) Dissolved (D)		Anions (C)***	EDB (8011)	
1 WBSY6-15	10/11/16	1555	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2 WBSY6-20		1600	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3 WBSY6-30		1605	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4 WBSY6-40		1610	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5 WBSY6-50		1615	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6 WBSY6-15		1650	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
7																		
8																		
9																		
10																		

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

**Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite Turn-around times for samples received after 4:00pm will begin on the following business day.

Sample Disposal: Return to Client Disposal by Lab (Samples will be held for 30 days unless otherwise noted. A fee may be assessed if samples are retained after 30 days.)

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

Relinquished Date/Time: 10/12/16 0855 Received Date/Time: 10/12/16 0855

Relinquished Date/Time: _____ Received Date/Time: _____

TAT → SameDay NextDay 2 Day 3 Day STD

*Please coordinate with the lab in advance



GeoEngineers

Chris Brown
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Rufus - Block 20
Work Order Number: 1611158

November 16, 2016

Attention Chris Brown:

Fremont Analytical, Inc. received 9 sample(s) on 11/15/2016 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Sample Moisture (Percent Moisture)
Total Metals by EPA Method 6020

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director



Date: 11/16/2016

CLIENT: GeoEngineers
Project: Rufus - Block 20
Work Order: 1611158

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1611158-001	D-W3530-4.5	11/15/2016 9:30 AM	11/15/2016 3:40 PM
1611158-002	D-W3525-4.5	11/15/2016 9:35 AM	11/15/2016 3:40 PM
1611158-003	D-W6527-4.5	11/15/2016 9:20 AM	11/15/2016 3:40 PM
1611158-004	D-528-4.5	11/15/2016 9:40 AM	11/15/2016 3:40 PM
1611158-005	W2510-10.0	11/15/2016 1:00 PM	11/15/2016 3:40 PM
1611158-006	W2513-5.0	11/15/2016 1:05 PM	11/15/2016 3:40 PM
1611158-007	W4510-5.0	11/15/2016 1:30 PM	11/15/2016 3:40 PM
1611158-008	510-5.0	11/15/2016 12:55 PM	11/15/2016 3:40 PM
1611158-009	W257-5.0	11/15/2016 1:10 PM	11/15/2016 3:40 PM

CLIENT: GeoEngineers
Project: Rufus - Block 20

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



CLIENT: GeoEngineers

Project: Rufus - Block 20

Lab ID: 1611158-001

Client Sample ID: D-W3530-4.5

Collection Date: 11/15/2016 9:30:00 AM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15464 Analyst: TN

Lead	57.0	0.178		mg/Kg-dry	1	11/16/2016 1:13:09 PM
------	------	-------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32947 Analyst: BB

Percent Moisture	15.4	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------

Lab ID: 1611158-002

Client Sample ID: D-W3525-4.5

Collection Date: 11/15/2016 9:35:00 AM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15464 Analyst: TN

Lead	59.6	0.186		mg/Kg-dry	1	11/16/2016 1:34:23 PM
------	------	-------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32947 Analyst: BB

Percent Moisture	13.8	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------

Lab ID: 1611158-003

Client Sample ID: D-W6527-4.5

Collection Date: 11/15/2016 9:20:00 AM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15464 Analyst: TN

Lead	42.4	0.181		mg/Kg-dry	1	11/16/2016 1:37:56 PM
------	------	-------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32947 Analyst: BB

Percent Moisture	11.6	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------



CLIENT: GeoEngineers

Project: Rufus - Block 20

Lab ID: 1611158-004

Client Sample ID: D-528-4.5

Collection Date: 11/15/2016 9:40:00 AM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15464

Analyst: TN

Lead	3.79	0.177		mg/Kg-dry	1	11/16/2016 1:41:28 PM
------	------	-------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R32947

Analyst: BB

Percent Moisture	12.6	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------

Lab ID: 1611158-005

Client Sample ID: W2510-10.0

Collection Date: 11/15/2016 1:00:00 PM

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15457

Analyst: WC

Diesel (Fuel Oil)	ND	24.1		mg/Kg-dry	1	11/15/2016 9:53:25 PM
Heavy Oil	ND	60.3		mg/Kg-dry	1	11/15/2016 9:53:25 PM
Surr: 2-Fluorobiphenyl	87.9	50-150		%Rec	1	11/15/2016 9:53:25 PM
Surr: o-Terphenyl	86.5	50-150		%Rec	1	11/15/2016 9:53:25 PM

Sample Moisture (Percent Moisture)

Batch ID: R32947

Analyst: BB

Percent Moisture	18.5	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------



CLIENT: GeoEngineers

Project: Rufus - Block 20

Lab ID: 1611158-006

Collection Date: 11/15/2016 1:05:00 PM

Client Sample ID: W2513-5.0

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>					Batch ID: 15457	Analyst: WC
Diesel (Fuel Oil)	ND	22.2		mg/Kg-dry	1	11/15/2016 10:55:23 PM
Heavy Oil	ND	55.6		mg/Kg-dry	1	11/15/2016 10:55:23 PM
Surr: 2-Fluorobiphenyl	87.7	50-150		%Rec	1	11/15/2016 10:55:23 PM
Surr: o-Terphenyl	83.9	50-150		%Rec	1	11/15/2016 10:55:23 PM

Sample Moisture (Percent Moisture)

Batch ID: R32947 Analyst: BB

Percent Moisture	14.4	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------

Lab ID: 1611158-007

Collection Date: 11/15/2016 1:30:00 PM

Client Sample ID: W4510-5.0

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>					Batch ID: 15457	Analyst: WC
Diesel (Fuel Oil)	ND	22.2		mg/Kg-dry	1	11/15/2016 11:26:19 PM
Heavy Oil	ND	55.4		mg/Kg-dry	1	11/15/2016 11:26:19 PM
Surr: 2-Fluorobiphenyl	88.5	50-150		%Rec	1	11/15/2016 11:26:19 PM
Surr: o-Terphenyl	86.8	50-150		%Rec	1	11/15/2016 11:26:19 PM

Sample Moisture (Percent Moisture)

Batch ID: R32947 Analyst: BB

Percent Moisture	15.2	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------



CLIENT: GeoEngineers

Project: Rufus - Block 20

Lab ID: 1611158-008

Collection Date: 11/15/2016 12:55:00 PM

Client Sample ID: 510-5.0

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>					Batch ID: 15457	Analyst: WC
Diesel (Fuel Oil)	ND	23.0		mg/Kg-dry	1	11/16/2016 12:59:07 AM
Heavy Oil	ND	57.6		mg/Kg-dry	1	11/16/2016 12:59:07 AM
Surr: 2-Fluorobiphenyl	92.3	50-150		%Rec	1	11/16/2016 12:59:07 AM
Surr: o-Terphenyl	89.3	50-150		%Rec	1	11/16/2016 12:59:07 AM

Sample Moisture (Percent Moisture)

Batch ID: R32947 Analyst: BB

Percent Moisture	17.2	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------

Lab ID: 1611158-009

Collection Date: 11/15/2016 1:10:00 PM

Client Sample ID: W257-5.0

Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>					Batch ID: 15457	Analyst: WC
Diesel (Fuel Oil)	ND	21.4		mg/Kg-dry	1	11/16/2016 1:30:03 AM
Heavy Oil	ND	53.4		mg/Kg-dry	1	11/16/2016 1:30:03 AM
Surr: 2-Fluorobiphenyl	90.8	50-150		%Rec	1	11/16/2016 1:30:03 AM
Surr: o-Terphenyl	87.1	50-150		%Rec	1	11/16/2016 1:30:03 AM

Sample Moisture (Percent Moisture)

Batch ID: R32947 Analyst: BB

Percent Moisture	15.5	0.500		wt%	1	11/16/2016 9:13:02 AM
------------------	------	-------	--	-----	---	-----------------------

Work Order: 1611158
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-15457	SampType: MBLK	Units: mg/Kg	Prep Date: 11/15/2016	RunNo: 32942							
Client ID: MBLKS	Batch ID: 15457		Analysis Date: 11/15/2016	SeqNo: 624286							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	21.2		20.00		106	50	150				
Surr: o-Terphenyl	19.5		20.00		97.7	50	150				

Sample ID LCS-15457	SampType: LCS	Units: mg/Kg	Prep Date: 11/15/2016	RunNo: 32942							
Client ID: LCSS	Batch ID: 15457		Analysis Date: 11/15/2016	SeqNo: 624285							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	437	20.0	500.0	0	87.5	65	135				
Surr: 2-Fluorobiphenyl	23.1		20.00		116	50	150				
Surr: o-Terphenyl	21.5		20.00		107	50	150				

Sample ID 1611150-002ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/15/2016	RunNo: 32942							
Client ID: BATCH	Batch ID: 15457		Analysis Date: 11/15/2016	SeqNo: 624554							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	22.4						0		30	
Heavy Oil	235	55.9						312.9	28.6	30	R
Surr: 2-Fluorobiphenyl	27.0		22.37		120	50	150		0		
Surr: o-Terphenyl	24.3		22.37		109	50	150		0		

NOTES:

R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).

Sample ID 1611150-002AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 11/15/2016	RunNo: 32942							
Client ID: BATCH	Batch ID: 15457		Analysis Date: 11/15/2016	SeqNo: 624555							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	653	21.9	548.1	0	119	65	135				
Surr: 2-Fluorobiphenyl	38.6		21.92		176	50	150				S

Work Order: 1611158
 CLIENT: GeoEngineers
 Project: Rufus - Block 20

QC SUMMARY REPORT
 Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID	1611150-002AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	11/15/2016	RunNo:	32942		
Client ID:	BATCH	Batch ID:	15457	Analysis Date:	11/15/2016	SeqNo:	624555				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: o-Terphenyl	38.0		21.92		173	50	150				S
-------------------	------	--	-------	--	-----	----	-----	--	--	--	---

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID	1611150-002AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	11/15/2016	RunNo:	32942		
Client ID:	BATCH	Batch ID:	15457	Analysis Date:	11/15/2016	SeqNo:	624556				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	755	22.0	549.6	0	137	65	135	652.5	14.6	30	S
Surr: 2-Fluorobiphenyl	36.5		21.98		166	50	150		0		S
Surr: o-Terphenyl	35.3		21.98		160	50	150		0		S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID	1611158-005ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	11/15/2016	RunNo:	32942		
Client ID:	W2510-10.0	Batch ID:	15457	Analysis Date:	11/15/2016	SeqNo:	624558				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	24.2						0		30	
Heavy Oil	ND	60.5						0		30	
Surr: 2-Fluorobiphenyl	20.5		24.22		84.8	50	150		0		
Surr: o-Terphenyl	20.3		24.22		83.7	50	150		0		



Work Order: 1611158
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID 1611158-009ADUP	SampType: DUP	Units: wt%	Prep Date: 11/16/2016	RunNo: 32947							
Client ID: W257-5.0	Batch ID: R32947	Analysis Date: 11/16/2016	SeqNo: 624516								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	16.4	0.500						15.54	5.37	20	



Date: 11/16/2016

Work Order: 1611158
CLIENT: GeoEngineers
Project: Rufus - Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-15464	SampType: MBLK	Units: mg/Kg	Prep Date: 11/16/2016	RunNo: 32958							
Client ID: MBLKS	Batch ID: 15464	Analysis Date: 11/16/2016	SeqNo: 624718								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead ND 0.156

Sample ID LCS-15464	SampType: LCS	Units: mg/Kg	Prep Date: 11/16/2016	RunNo: 32958							
Client ID: LCSS	Batch ID: 15464	Analysis Date: 11/16/2016	SeqNo: 624718								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 19.8 0.157 19.69 0 101 80 120

Sample ID 1611158-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/16/2016	RunNo: 32958							
Client ID: D-W3530-4.5	Batch ID: 15464	Analysis Date: 11/16/2016	SeqNo: 624723								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 36.5 0.179 56.95 43.7 20 R

NOTES:

R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID 1611158-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 11/16/2016	RunNo: 32958							
Client ID: D-W3530-4.5	Batch ID: 15464	Analysis Date: 11/16/2016	SeqNo: 624725								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 78.6 0.178 22.21 56.95 97.6 75 125

Sample ID 1611158-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/16/2016	RunNo: 32958							
Client ID: D-W3530-4.5	Batch ID: 15464	Analysis Date: 11/16/2016	SeqNo: 624726								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead 76.0 0.176 22.04 56.95 86.3 75 125 78.63 3.42 20

Client Name: **GEI**
 Logged by: **Erica Silva**

 Work Order Number: **1611158**
 Date Received: **11/15/2016 3:40:00 PM**
Chain of Custody

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

Log In

3. Coolers are present? Yes No NA
4. Shipping container/cooler in good condition? Yes No
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes No Not Required
6. Was an attempt made to cool the samples? Yes No NA

Unknown prior to receipt

7. Were all items received at a temperature of >0°C to 10.0°C * Yes No NA

Please refer to Item Information

8. Sample(s) in proper container(s)? Yes No
9. Sufficient sample volume for indicated test(s)? Yes No
10. Are samples properly preserved? Yes No
11. Was preservative added to bottles? Yes No NA
12. Is there headspace in the VOA vials? Yes No NA
13. Did all samples containers arrive in good condition(unbroken)? Yes No
14. Does paperwork match bottle labels? Yes No
15. Are matrices correctly identified on Chain of Custody? Yes No
16. Is it clear what analyses were requested? Yes No
17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	13.8
Sample	12.4

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



GeoEngineers

Chris Brown
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Rufus Block 20
Work Order Number: 1611216

November 22, 2016

Attention Chris Brown:

Fremont Analytical, Inc. received 16 sample(s) on 11/21/2016 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Gasoline by NWTPH-Gx
Mercury by EPA Method 7471
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)
Total Metals by EPA Method 6020
Volatile Organic Compounds by EPA Method 8260C

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director



CLIENT: GeoEngineers
Project: Rufus Block 20
Work Order: 1611216

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1611216-001	TP-W3S5-5.0	11/21/2016 11:40 AM	11/21/2016 1:20 PM
1611216-002	TP-W4S20-5.0	11/21/2016 11:30 AM	11/21/2016 1:20 PM
1611216-003	TP-W4S35-2.5	11/21/2016 9:20 AM	11/21/2016 1:20 PM
1611216-004	TP-W4S35-5.0	11/21/2016 9:25 AM	11/21/2016 1:20 PM
1611216-005	TP-W4S35-7.5	11/21/2016 9:30 AM	11/21/2016 1:20 PM
1611216-006	TP-W4S35-10.0	11/21/2016 9:35 AM	11/21/2016 1:20 PM
1611216-007	TP-W4S35-12.5	11/21/2016 9:40 AM	11/21/2016 1:20 PM
1611216-008	TP-W4S35-15.0	11/21/2016 9:45 AM	11/21/2016 1:20 PM
1611216-009	TP-W14S9-2.5	11/21/2016 10:10 AM	11/21/2016 1:20 PM
1611216-010	TP-W14S9-5.0	11/21/2016 10:15 AM	11/21/2016 1:20 PM
1611216-011	TP-W14S9-7.5	11/21/2016 10:20 AM	11/21/2016 1:20 PM
1611216-012	TP-W14S36-2.5	11/21/2016 8:20 AM	11/21/2016 1:20 PM
1611216-013	TP-W14S36-5.0	11/21/2016 8:25 AM	11/21/2016 1:20 PM
1611216-014	TP-W14S36-7.5	11/21/2016 8:30 AM	11/21/2016 1:20 PM
1611216-015	TP-W14S36-10.0	11/21/2016 8:35 AM	11/21/2016 1:20 PM
1611216-016	TP-W14S36-12.5	11/21/2016 8:40 AM	11/21/2016 1:20 PM

CLIENT: GeoEngineers

Project: Rufus Block 20

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Client: GeoEngineers

Collection Date: 11/21/2016 11:40:00 AM

Project: Rufus Block 20

Lab ID: 1611216-001

Matrix: Soil

Client Sample ID: TP-W3S5-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15507

Analyst: WC

Diesel (Fuel Oil)	ND	21.2		mg/Kg-dry	1	11/21/2016 7:44:00 PM
Heavy Oil	ND	52.9		mg/Kg-dry	1	11/21/2016 7:44:00 PM
Surr: 2-Fluorobiphenyl	75.4	50-150		%Rec	1	11/21/2016 7:44:00 PM
Surr: o-Terphenyl	79.5	50-150		%Rec	1	11/21/2016 7:44:00 PM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15505

Analyst: BT

Naphthalene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
2-Methylnaphthalene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
1-Methylnaphthalene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Acenaphthylene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Acenaphthene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Fluorene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Phenanthrene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Anthracene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Fluoranthene	78.6	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Pyrene	85.3	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Benz(a)anthracene	65.0	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Chrysene	52.9	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Benzo(b)fluoranthene	92.7	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Benzo(k)fluoranthene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Benzo(a)pyrene	86.4	44.0	Q+	µg/Kg-dry	1	11/22/2016 1:29:30 AM
Indeno(1,2,3-cd)pyrene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Dibenz(a,h)anthracene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Benzo(g,h,i)perylene	ND	44.0		µg/Kg-dry	1	11/22/2016 1:29:30 AM
Surr: 2-Fluorobiphenyl	87.2	24.5-139		%Rec	1	11/22/2016 1:29:30 AM
Surr: Terphenyl-d14 (surr)	95.7	44.3-176		%Rec	1	11/22/2016 1:29:30 AM

NOTES:

Q+ - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF) - high bias

Gasoline by NWTPH-Gx

Batch ID: 15503

Analyst: EM

Gasoline	ND	5.57		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Surr: Toluene-d8	103	65-135		%Rec	1	11/22/2016 7:02:00 AM
Surr: 4-Bromofluorobenzene	80.1	65-135		%Rec	1	11/22/2016 7:02:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 11:40:00 AM

Project: Rufus Block 20

Lab ID: 1611216-001

Matrix: Soil

Client Sample ID: TP-W3S5-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

Dichlorodifluoromethane (CFC-12)	ND	0.0668		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Chloromethane	ND	0.0668		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Vinyl chloride	ND	0.00223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Bromomethane	ND	0.100		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0557	Q	mg/Kg-dry	1	11/22/2016 7:02:00 AM
Chloroethane	ND	0.0668	Q	mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,1-Dichloroethene	ND	0.0557	Q	mg/Kg-dry	1	11/22/2016 7:02:00 AM
Methylene chloride	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
trans-1,2-Dichloroethene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0557		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,1-Dichloroethane	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
2,2-Dichloropropane	ND	0.0557		mg/Kg-dry	1	11/22/2016 7:02:00 AM
cis-1,2-Dichloroethene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Chloroform	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,1-Dichloropropene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Carbon tetrachloride	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2-Dichloroethane (EDC)	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Benzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Trichloroethene (TCE)	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2-Dichloropropane	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Bromodichloromethane	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Dibromomethane	ND	0.0445		mg/Kg-dry	1	11/22/2016 7:02:00 AM
cis-1,3-Dichloropropene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Toluene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
trans-1,3-Dichloropropylene	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,1,2-Trichloroethane	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,3-Dichloropropane	ND	0.0557		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Tetrachloroethene (PCE)	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Dibromochloromethane	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2-Dibromoethane (EDB)	ND	0.00557		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Chlorobenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Ethylbenzene	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
m,p-Xylene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
o-Xylene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Styrene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Isopropylbenzene	ND	0.0891		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Bromoform	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 11:40:00 AM

Project: Rufus Block 20

Lab ID: 1611216-001

Matrix: Soil

Client Sample ID: TP-W3S5-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

1,1,2,2-Tetrachloroethane	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
n-Propylbenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Bromobenzene	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,3,5-Trimethylbenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
2-Chlorotoluene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
4-Chlorotoluene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
tert-Butylbenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2,3-Trichloropropane	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2,4-Trichlorobenzene	ND	0.0557		mg/Kg-dry	1	11/22/2016 7:02:00 AM
sec-Butylbenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
4-Isopropyltoluene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,3-Dichlorobenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,4-Dichlorobenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
n-Butylbenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2-Dichlorobenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2-Dibromo-3-chloropropane	ND	0.557		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2,4-Trimethylbenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Hexachlorobutadiene	ND	0.111		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Naphthalene	ND	0.0334		mg/Kg-dry	1	11/22/2016 7:02:00 AM
1,2,3-Trichlorobenzene	ND	0.0223		mg/Kg-dry	1	11/22/2016 7:02:00 AM
Surr: Dibromofluoromethane	87.1	56.5-129		%Rec	1	11/22/2016 7:02:00 AM
Surr: Toluene-d8	95.1	64.3-131		%Rec	1	11/22/2016 7:02:00 AM
Surr: 1-Bromo-4-fluorobenzene	95.1	63.1-141		%Rec	1	11/22/2016 7:02:00 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15509

Analyst: WF

Mercury	ND	0.290		mg/Kg-dry	1	11/22/2016 5:21:29 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15512

Analyst: TN

Arsenic	6.47	0.0902		mg/Kg-dry	1	11/22/2016 3:43:45 PM
Barium	204	0.451		mg/Kg-dry	1	11/22/2016 3:43:45 PM
Cadmium	0.293	0.180		mg/Kg-dry	1	11/22/2016 3:43:45 PM
Chromium	55.1	0.0902		mg/Kg-dry	1	11/22/2016 3:43:45 PM
Lead	165	0.180		mg/Kg-dry	1	11/22/2016 3:43:45 PM
Selenium	1.41	0.451		mg/Kg-dry	1	11/22/2016 3:43:45 PM



Client: GeoEngineers

Collection Date: 11/21/2016 11:40:00 AM

Project: Rufus Block 20

Lab ID: 1611216-001

Matrix: Soil

Client Sample ID: TP-W3S5-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15512 Analyst: TN

Silver	0.129	0.0902		mg/Kg-dry	1	11/22/2016 3:43:45 PM
--------	-------	--------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R33041 Analyst: BB

Percent Moisture	20.2			wt%	1	11/22/2016 8:58:04 AM
------------------	------	--	--	-----	---	-----------------------



Client: GeoEngineers

Collection Date: 11/21/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-002

Matrix: Soil

Client Sample ID: TP-W4S20-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15507

Analyst: WC

Diesel (Fuel Oil)	ND	23.2		mg/Kg-dry	1	11/21/2016 8:15:00 PM
Heavy Oil	ND	58.0		mg/Kg-dry	1	11/21/2016 8:15:00 PM
Surr: 2-Fluorobiphenyl	80.5	50-150		%Rec	1	11/21/2016 8:15:00 PM
Surr: o-Terphenyl	84.1	50-150		%Rec	1	11/21/2016 8:15:00 PM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15505

Analyst: BT

Naphthalene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
2-Methylnaphthalene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
1-Methylnaphthalene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Acenaphthylene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Acenaphthene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Fluorene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Phenanthrene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Anthracene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Fluoranthene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Pyrene	43.7	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Benz(a)anthracene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Chrysene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Benzo(b)fluoranthene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Benzo(k)fluoranthene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Benzo(a)pyrene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Indeno(1,2,3-cd)pyrene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Dibenz(a,h)anthracene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Benzo(g,h,i)perylene	ND	41.7		µg/Kg-dry	1	11/22/2016 1:50:12 AM
Surr: 2-Fluorobiphenyl	80.4	24.5-139		%Rec	1	11/22/2016 1:50:12 AM
Surr: Terphenyl-d14 (surr)	89.7	44.3-176		%Rec	1	11/22/2016 1:50:12 AM

Gasoline by NWTPH-Gx

Batch ID: 15503

Analyst: EM

Gasoline	ND	5.09		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Surr: Toluene-d8	99.0	65-135		%Rec	1	11/22/2016 7:31:00 AM
Surr: 4-Bromofluorobenzene	90.2	65-135		%Rec	1	11/22/2016 7:31:00 AM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

Dichlorodifluoromethane (CFC-12)	ND	0.0610		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Chloromethane	ND	0.0610		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Vinyl chloride	ND	0.00203		mg/Kg-dry	1	11/22/2016 7:31:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-002

Matrix: Soil

Client Sample ID: TP-W4S20-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

Bromomethane	ND	0.0915		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0509	Q	mg/Kg-dry	1	11/22/2016 7:31:00 AM
Chloroethane	ND	0.0610	Q	mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,1-Dichloroethene	ND	0.0509	Q	mg/Kg-dry	1	11/22/2016 7:31:00 AM
Methylene chloride	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
trans-1,2-Dichloroethene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0509		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,1-Dichloroethane	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
2,2-Dichloropropane	ND	0.0509		mg/Kg-dry	1	11/22/2016 7:31:00 AM
cis-1,2-Dichloroethene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Chloroform	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,1-Dichloropropene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Carbon tetrachloride	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2-Dichloroethane (EDC)	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Benzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Trichloroethene (TCE)	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2-Dichloropropane	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Bromodichloromethane	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Dibromomethane	ND	0.0407		mg/Kg-dry	1	11/22/2016 7:31:00 AM
cis-1,3-Dichloropropene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Toluene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
trans-1,3-Dichloropropylene	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,1,2-Trichloroethane	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,3-Dichloropropane	ND	0.0509		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Tetrachloroethene (PCE)	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Dibromochloromethane	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2-Dibromoethane (EDB)	ND	0.00509		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Chlorobenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Ethylbenzene	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM
m,p-Xylene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
o-Xylene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Styrene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Isopropylbenzene	ND	0.0814		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Bromoform	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,1,2,2-Tetrachloroethane	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
n-Propylbenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Bromobenzene	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-002

Matrix: Soil

Client Sample ID: TP-W4S20-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

1,3,5-Trimethylbenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
2-Chlorotoluene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
4-Chlorotoluene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
tert-Butylbenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2,3-Trichloropropane	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2,4-Trichlorobenzene	ND	0.0509		mg/Kg-dry	1	11/22/2016 7:31:00 AM
sec-Butylbenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
4-Isopropyltoluene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,3-Dichlorobenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,4-Dichlorobenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
n-Butylbenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2-Dichlorobenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2-Dibromo-3-chloropropane	ND	0.509		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2,4-Trimethylbenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Hexachlorobutadiene	ND	0.102		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Naphthalene	ND	0.0305		mg/Kg-dry	1	11/22/2016 7:31:00 AM
1,2,3-Trichlorobenzene	ND	0.0203		mg/Kg-dry	1	11/22/2016 7:31:00 AM
Surr: Dibromofluoromethane	91.1	56.5-129		%Rec	1	11/22/2016 7:31:00 AM
Surr: Toluene-d8	114	64.3-131		%Rec	1	11/22/2016 7:31:00 AM
Surr: 1-Bromo-4-fluorobenzene	107	63.1-141		%Rec	1	11/22/2016 7:31:00 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15509

Analyst: WF

Mercury	ND	0.298		mg/Kg-dry	1	11/22/2016 5:27:58 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15512

Analyst: TN

Arsenic	6.03	0.0911		mg/Kg-dry	1	11/22/2016 3:47:17 PM
Barium	111	0.456		mg/Kg-dry	1	11/22/2016 3:47:17 PM
Cadmium	0.317	0.182		mg/Kg-dry	1	11/22/2016 3:47:17 PM
Chromium	43.4	0.0911		mg/Kg-dry	1	11/22/2016 3:47:17 PM
Lead	89.0	0.182		mg/Kg-dry	1	11/22/2016 3:47:17 PM
Selenium	1.38	0.456		mg/Kg-dry	1	11/22/2016 3:47:17 PM
Silver	ND	0.0911		mg/Kg-dry	1	11/22/2016 3:47:17 PM



Client: GeoEngineers

Collection Date: 11/21/2016 11:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-002

Matrix: Soil

Client Sample ID: TP-W4S20-5.0

Analyses

Result

RL

Qual

Units

DF

Date Analyzed

Sample Moisture (Percent Moisture)

Batch ID: R33041

Analyst: BB

Percent Moisture

16.2

wt%

1

11/22/2016 8:58:04 AM



Client: GeoEngineers

Collection Date: 11/21/2016 9:35:00 AM

Project: Rufus Block 20

Lab ID: 1611216-006

Matrix: Soil

Client Sample ID: TP-W4S35-10.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15507

Analyst: WC

Diesel (Fuel Oil)	ND	20.9		mg/Kg-dry	1	11/21/2016 8:47:00 PM
Heavy Oil	ND	52.4		mg/Kg-dry	1	11/21/2016 8:47:00 PM
Surr: 2-Fluorobiphenyl	85.7	50-150		%Rec	1	11/21/2016 8:47:00 PM
Surr: o-Terphenyl	87.4	50-150		%Rec	1	11/21/2016 8:47:00 PM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15505

Analyst: BT

Naphthalene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
2-Methylnaphthalene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
1-Methylnaphthalene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Acenaphthylene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Acenaphthene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Fluorene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Phenanthrene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Anthracene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Fluoranthene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Pyrene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Benz(a)anthracene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Chrysene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Benzo(b)fluoranthene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Benzo(k)fluoranthene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Benzo(a)pyrene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Indeno(1,2,3-cd)pyrene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Dibenz(a,h)anthracene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Benzo(g,h,i)perylene	ND	38.8		µg/Kg-dry	1	11/22/2016 2:10:56 AM
Surr: 2-Fluorobiphenyl	74.7	24.5-139		%Rec	1	11/22/2016 2:10:56 AM
Surr: Terphenyl-d14 (surr)	81.4	44.3-176		%Rec	1	11/22/2016 2:10:56 AM

Gasoline by NWTPH-Gx

Batch ID: 15503

Analyst: EM

Gasoline	ND	4.70		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Surr: Toluene-d8	98.2	65-135		%Rec	1	11/22/2016 7:59:00 AM
Surr: 4-Bromofluorobenzene	88.2	65-135		%Rec	1	11/22/2016 7:59:00 AM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

Dichlorodifluoromethane (CFC-12)	ND	0.0564		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Chloromethane	ND	0.0564		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Vinyl chloride	ND	0.00188		mg/Kg-dry	1	11/22/2016 7:59:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 9:35:00 AM

Project: Rufus Block 20

Lab ID: 1611216-006

Matrix: Soil

Client Sample ID: TP-W4S35-10.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Volatile Organic Compounds by EPA Method 8260C</u>						
					Batch ID: 15503	Analyst: EM
Bromomethane	ND	0.0846		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0470	Q	mg/Kg-dry	1	11/22/2016 7:59:00 AM
Chloroethane	ND	0.0564	Q	mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,1-Dichloroethene	ND	0.0470	Q	mg/Kg-dry	1	11/22/2016 7:59:00 AM
Methylene chloride	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
trans-1,2-Dichloroethene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0470		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,1-Dichloroethane	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
2,2-Dichloropropane	ND	0.0470		mg/Kg-dry	1	11/22/2016 7:59:00 AM
cis-1,2-Dichloroethene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Chloroform	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,1-Dichloropropene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Carbon tetrachloride	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2-Dichloroethane (EDC)	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Benzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Trichloroethene (TCE)	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2-Dichloropropane	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Bromodichloromethane	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Dibromomethane	ND	0.0376		mg/Kg-dry	1	11/22/2016 7:59:00 AM
cis-1,3-Dichloropropene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Toluene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
trans-1,3-Dichloropropylene	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,1,2-Trichloroethane	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,3-Dichloropropane	ND	0.0470		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Tetrachloroethene (PCE)	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Dibromochloromethane	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2-Dibromoethane (EDB)	ND	0.00470		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Chlorobenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Ethylbenzene	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM
m,p-Xylene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
o-Xylene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Styrene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Isopropylbenzene	ND	0.0752		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Bromoform	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,1,2,2-Tetrachloroethane	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
n-Propylbenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Bromobenzene	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 9:35:00 AM

Project: Rufus Block 20

Lab ID: 1611216-006

Matrix: Soil

Client Sample ID: TP-W4S35-10.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

1,3,5-Trimethylbenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
2-Chlorotoluene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
4-Chlorotoluene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
tert-Butylbenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2,3-Trichloropropane	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2,4-Trichlorobenzene	ND	0.0470		mg/Kg-dry	1	11/22/2016 7:59:00 AM
sec-Butylbenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
4-Isopropyltoluene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,3-Dichlorobenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,4-Dichlorobenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
n-Butylbenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2-Dichlorobenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2-Dibromo-3-chloropropane	ND	0.470		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2,4-Trimethylbenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Hexachlorobutadiene	ND	0.0940		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Naphthalene	ND	0.0282		mg/Kg-dry	1	11/22/2016 7:59:00 AM
1,2,3-Trichlorobenzene	ND	0.0188		mg/Kg-dry	1	11/22/2016 7:59:00 AM
Surr: Dibromofluoromethane	92.4	56.5-129		%Rec	1	11/22/2016 7:59:00 AM
Surr: Toluene-d8	99.1	64.3-131		%Rec	1	11/22/2016 7:59:00 AM
Surr: 1-Bromo-4-fluorobenzene	105	63.1-141		%Rec	1	11/22/2016 7:59:00 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15509

Analyst: WF

Mercury	ND	0.280		mg/Kg-dry	1	11/22/2016 5:29:33 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15512

Analyst: TN

Arsenic	2.49	0.0860		mg/Kg-dry	1	11/22/2016 3:50:49 PM
Barium	49.7	0.430		mg/Kg-dry	1	11/22/2016 3:50:49 PM
Cadmium	ND	0.172		mg/Kg-dry	1	11/22/2016 3:50:49 PM
Chromium	24.1	0.0860		mg/Kg-dry	1	11/22/2016 3:50:49 PM
Lead	6.93	0.172		mg/Kg-dry	1	11/22/2016 3:50:49 PM
Selenium	1.10	0.430		mg/Kg-dry	1	11/22/2016 3:50:49 PM
Silver	ND	0.0860		mg/Kg-dry	1	11/22/2016 3:50:49 PM



Client: GeoEngineers

Collection Date: 11/21/2016 9:35:00 AM

Project: Rufus Block 20

Lab ID: 1611216-006

Matrix: Soil

Client Sample ID: TP-W4S35-10.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Sample Moisture (Percent Moisture)

Batch ID: R33041 Analyst: BB

Percent Moisture	12.6			wt%	1	11/22/2016 8:58:04 AM
------------------	------	--	--	-----	---	-----------------------



Client: GeoEngineers

Collection Date: 11/21/2016 10:15:00 AM

Project: Rufus Block 20

Lab ID: 1611216-010

Matrix: Soil

Client Sample ID: TP-W14S9-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

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

Batch ID: 15507

Analyst: WC

Diesel (Fuel Oil)	ND	27.1		mg/Kg-dry	1	11/21/2016 9:18:00 PM
Heavy Oil	ND	67.7		mg/Kg-dry	1	11/21/2016 9:18:00 PM
Surr: 2-Fluorobiphenyl	92.9	50-150		%Rec	1	11/21/2016 9:18:00 PM
Surr: o-Terphenyl	93.5	50-150		%Rec	1	11/21/2016 9:18:00 PM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 15505

Analyst: BT

Naphthalene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
2-Methylnaphthalene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
1-Methylnaphthalene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Acenaphthylene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Acenaphthene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Fluorene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Phenanthrene	83.4	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Anthracene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Fluoranthene	120	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Pyrene	113	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Benz(a)anthracene	93.6	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Chrysene	85.5	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Benzo(b)fluoranthene	127	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Benzo(k)fluoranthene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Benzo(a)pyrene	98.2	49.8	Q+	µg/Kg-dry	1	11/22/2016 2:31:39 AM
Indeno(1,2,3-cd)pyrene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Dibenz(a,h)anthracene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Benzo(g,h,i)perylene	ND	49.8		µg/Kg-dry	1	11/22/2016 2:31:39 AM
Surr: 2-Fluorobiphenyl	57.2	24.5-139		%Rec	1	11/22/2016 2:31:39 AM
Surr: Terphenyl-d14 (surr)	65.3	44.3-176		%Rec	1	11/22/2016 2:31:39 AM

NOTES:

Q+ - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF) - high bias

Gasoline by NWTPH-Gx

Batch ID: 15503

Analyst: EM

Gasoline	ND	7.78		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Surr: Toluene-d8	101	65-135		%Rec	1	11/22/2016 8:27:00 AM
Surr: 4-Bromofluorobenzene	86.1	65-135		%Rec	1	11/22/2016 8:27:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 10:15:00 AM

Project: Rufus Block 20

Lab ID: 1611216-010

Matrix: Soil

Client Sample ID: TP-W14S9-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

Dichlorodifluoromethane (CFC-12)	ND	0.0933		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Chloromethane	ND	0.0933		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Vinyl chloride	ND	0.00311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Bromomethane	ND	0.140		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0778	Q	mg/Kg-dry	1	11/22/2016 8:27:00 AM
Chloroethane	ND	0.0933	Q	mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,1-Dichloroethene	ND	0.0778	Q	mg/Kg-dry	1	11/22/2016 8:27:00 AM
Methylene chloride	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
trans-1,2-Dichloroethene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0778		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,1-Dichloroethane	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
2,2-Dichloropropane	ND	0.0778		mg/Kg-dry	1	11/22/2016 8:27:00 AM
cis-1,2-Dichloroethene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Chloroform	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,1-Dichloropropene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Carbon tetrachloride	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2-Dichloroethane (EDC)	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Benzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Trichloroethene (TCE)	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2-Dichloropropane	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Bromodichloromethane	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Dibromomethane	ND	0.0622		mg/Kg-dry	1	11/22/2016 8:27:00 AM
cis-1,3-Dichloropropene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Toluene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
trans-1,3-Dichloropropylene	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,1,2-Trichloroethane	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,3-Dichloropropane	ND	0.0778		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Tetrachloroethene (PCE)	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Dibromochloromethane	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2-Dibromoethane (EDB)	ND	0.00778		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Chlorobenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Ethylbenzene	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
m,p-Xylene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
o-Xylene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Styrene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Isopropylbenzene	ND	0.124		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Bromoform	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 10:15:00 AM

Project: Rufus Block 20

Lab ID: 1611216-010

Matrix: Soil

Client Sample ID: TP-W14S9-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

1,1,2,2-Tetrachloroethane	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
n-Propylbenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Bromobenzene	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,3,5-Trimethylbenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
2-Chlorotoluene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
4-Chlorotoluene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
tert-Butylbenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2,3-Trichloropropane	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2,4-Trichlorobenzene	ND	0.0778		mg/Kg-dry	1	11/22/2016 8:27:00 AM
sec-Butylbenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
4-Isopropyltoluene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,3-Dichlorobenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,4-Dichlorobenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
n-Butylbenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2-Dichlorobenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2-Dibromo-3-chloropropane	ND	0.778		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2,4-Trimethylbenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Hexachlorobutadiene	ND	0.156		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Naphthalene	ND	0.0467		mg/Kg-dry	1	11/22/2016 8:27:00 AM
1,2,3-Trichlorobenzene	ND	0.0311		mg/Kg-dry	1	11/22/2016 8:27:00 AM
Surr: Dibromofluoromethane	89.0	56.5-129		%Rec	1	11/22/2016 8:27:00 AM
Surr: Toluene-d8	100	64.3-131		%Rec	1	11/22/2016 8:27:00 AM
Surr: 1-Bromo-4-fluorobenzene	102	63.1-141		%Rec	1	11/22/2016 8:27:00 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15509

Analyst: WF

Mercury	0.528	0.350		mg/Kg-dry	1	11/22/2016 5:31:14 PM
---------	-------	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15512

Analyst: TN

Arsenic	15.0	0.112		mg/Kg-dry	1	11/22/2016 3:54:21 PM
Barium	6,100	0.560		mg/Kg-dry	1	11/22/2016 3:54:21 PM
Cadmium	57.9	0.224		mg/Kg-dry	1	11/22/2016 3:54:21 PM
Chromium	145	0.112		mg/Kg-dry	1	11/22/2016 3:54:21 PM
Lead	7,870	0.224	E	mg/Kg-dry	1	11/22/2016 3:54:21 PM
Selenium	1.32	0.560		mg/Kg-dry	1	11/22/2016 3:54:21 PM



Client: GeoEngineers

Collection Date: 11/21/2016 10:15:00 AM

Project: Rufus Block 20

Lab ID: 1611216-010

Matrix: Soil

Client Sample ID: TP-W14S9-5.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Total Metals by EPA Method 6020

Batch ID: 15512 Analyst: TN

Silver	3.54	0.112		mg/Kg-dry	1	11/22/2016 3:54:21 PM
--------	------	-------	--	-----------	---	-----------------------

Sample Moisture (Percent Moisture)

Batch ID: R33041 Analyst: BB

Percent Moisture	31.3			wt%	1	11/22/2016 8:58:04 AM
------------------	------	--	--	-----	---	-----------------------



Client: GeoEngineers

Collection Date: 11/21/2016 8:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-014

Matrix: Soil

Client Sample ID: TP-W14S36-7.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.</u>			Batch ID: 15507		Analyst: WC	
Diesel (Fuel Oil)	ND	21.5		mg/Kg-dry	1	11/21/2016 9:49:00 PM
Heavy Oil	ND	53.8		mg/Kg-dry	1	11/21/2016 9:49:00 PM
Surr: 2-Fluorobiphenyl	69.4	50-150		%Rec	1	11/21/2016 9:49:00 PM
Surr: o-Terphenyl	78.7	50-150		%Rec	1	11/21/2016 9:49:00 PM
<u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u>			Batch ID: 15505		Analyst: BT	
Naphthalene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
2-Methylnaphthalene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
1-Methylnaphthalene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Acenaphthylene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Acenaphthene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Fluorene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Phenanthrene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Anthracene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Fluoranthene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Pyrene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Benz(a)anthracene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Chrysene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Benzo(b)fluoranthene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Benzo(k)fluoranthene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Benzo(a)pyrene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Indeno(1,2,3-cd)pyrene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Dibenz(a,h)anthracene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Benzo(g,h,i)perylene	ND	49.3		µg/Kg-dry	1	11/22/2016 2:52:21 AM
Surr: 2-Fluorobiphenyl	88.0	24.5-139		%Rec	1	11/22/2016 2:52:21 AM
Surr: Terphenyl-d14 (surr)	93.6	44.3-176		%Rec	1	11/22/2016 2:52:21 AM
<u>Gasoline by NWTPH-Gx</u>			Batch ID: 15503		Analyst: EM	
Gasoline	ND	5.99		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Surr: Toluene-d8	98.1	65-135		%Rec	1	11/22/2016 8:55:00 AM
Surr: 4-Bromofluorobenzene	68.5	65-135		%Rec	1	11/22/2016 8:55:00 AM
<u>Volatile Organic Compounds by EPA Method 8260C</u>			Batch ID: 15503		Analyst: EM	
Dichlorodifluoromethane (CFC-12)	ND	0.0718		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Chloromethane	ND	0.0718		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Vinyl chloride	ND	0.00239		mg/Kg-dry	1	11/22/2016 8:55:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 8:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-014

Matrix: Soil

Client Sample ID: TP-W14S36-7.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

Bromomethane	ND	0.108		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Trichlorofluoromethane (CFC-11)	ND	0.0599	Q	mg/Kg-dry	1	11/22/2016 8:55:00 AM
Chloroethane	ND	0.0718	Q	mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,1-Dichloroethene	ND	0.0599	Q	mg/Kg-dry	1	11/22/2016 8:55:00 AM
Methylene chloride	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
trans-1,2-Dichloroethene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Methyl tert-butyl ether (MTBE)	ND	0.0599		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,1-Dichloroethane	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
2,2-Dichloropropane	ND	0.0599		mg/Kg-dry	1	11/22/2016 8:55:00 AM
cis-1,2-Dichloroethene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Chloroform	0.0377	0.0239	B	mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,1,1-Trichloroethane (TCA)	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,1-Dichloropropene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Carbon tetrachloride	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2-Dichloroethane (EDC)	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Benzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Trichloroethene (TCE)	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2-Dichloropropane	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Bromodichloromethane	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Dibromomethane	ND	0.0479		mg/Kg-dry	1	11/22/2016 8:55:00 AM
cis-1,3-Dichloropropene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Toluene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
trans-1,3-Dichloropropylene	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,1,2-Trichloroethane	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,3-Dichloropropane	ND	0.0599		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Tetrachloroethene (PCE)	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Dibromochloromethane	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2-Dibromoethane (EDB)	ND	0.00599		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Chlorobenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,1,1,2-Tetrachloroethane	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Ethylbenzene	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM
m,p-Xylene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
o-Xylene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Styrene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Isopropylbenzene	ND	0.0958		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Bromoform	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,1,2,2-Tetrachloroethane	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
n-Propylbenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Bromobenzene	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM



Client: GeoEngineers

Collection Date: 11/21/2016 8:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-014

Matrix: Soil

Client Sample ID: TP-W14S36-7.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 15503

Analyst: EM

1,3,5-Trimethylbenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
2-Chlorotoluene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
4-Chlorotoluene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
tert-Butylbenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2,3-Trichloropropane	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2,4-Trichlorobenzene	ND	0.0599		mg/Kg-dry	1	11/22/2016 8:55:00 AM
sec-Butylbenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
4-Isopropyltoluene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,3-Dichlorobenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,4-Dichlorobenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
n-Butylbenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2-Dichlorobenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2-Dibromo-3-chloropropane	ND	0.599		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2,4-Trimethylbenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Hexachlorobutadiene	ND	0.120		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Naphthalene	ND	0.0359		mg/Kg-dry	1	11/22/2016 8:55:00 AM
1,2,3-Trichlorobenzene	ND	0.0239		mg/Kg-dry	1	11/22/2016 8:55:00 AM
Surr: Dibromofluoromethane	90.0	56.5-129		%Rec	1	11/22/2016 8:55:00 AM
Surr: Toluene-d8	101	64.3-131		%Rec	1	11/22/2016 8:55:00 AM
Surr: 1-Bromo-4-fluorobenzene	81.3	63.1-141		%Rec	1	11/22/2016 8:55:00 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Mercury by EPA Method 7471

Batch ID: 15509

Analyst: WF

Mercury	ND	0.281		mg/Kg-dry	1	11/22/2016 5:32:50 PM
---------	----	-------	--	-----------	---	-----------------------

Total Metals by EPA Method 6020

Batch ID: 15512

Analyst: TN

Arsenic	3.34	0.0923		mg/Kg-dry	1	11/22/2016 3:57:53 PM
Barium	54.9	0.462		mg/Kg-dry	1	11/22/2016 3:57:53 PM
Cadmium	ND	0.185		mg/Kg-dry	1	11/22/2016 3:57:53 PM
Chromium	25.8	0.0923		mg/Kg-dry	1	11/22/2016 3:57:53 PM
Lead	7.04	0.185		mg/Kg-dry	1	11/22/2016 3:57:53 PM
Selenium	1.01	0.462		mg/Kg-dry	1	11/22/2016 3:57:53 PM
Silver	ND	0.0923		mg/Kg-dry	1	11/22/2016 3:57:53 PM



Client: GeoEngineers

Collection Date: 11/21/2016 8:30:00 AM

Project: Rufus Block 20

Lab ID: 1611216-014

Matrix: Soil

Client Sample ID: TP-W14S36-7.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
----------	--------	----	------	-------	----	---------------

Sample Moisture (Percent Moisture)

Batch ID: R33041 Analyst: BB

Percent Moisture	19.2			wt%	1	11/22/2016 8:58:04 AM
------------------	------	--	--	-----	---	-----------------------

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-15507	SampType: MBLK	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33039							
Client ID: MBLKS	Batch ID: 15507		Analysis Date: 11/21/2016	SeqNo: 626111							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	18.4		20.00		92.1	50	150				
Surr: o-Terphenyl	18.8		20.00		93.8	50	150				

Sample ID LCS-15507	SampType: LCS	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33039							
Client ID: LCSS	Batch ID: 15507		Analysis Date: 11/21/2016	SeqNo: 626110							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	473	20.0	500.0	0	94.7	65	135				
Surr: 2-Fluorobiphenyl	21.5		20.00		108	50	150				
Surr: o-Terphenyl	22.3		20.00		112	50	150				

Sample ID 1611220-002ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33039							
Client ID: BATCH	Batch ID: 15507		Analysis Date: 11/22/2016	SeqNo: 626113							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	21.0						0		30	
Heavy Oil	ND	52.5						0		30	
Surr: 2-Fluorobiphenyl	17.6		20.98		83.6	50	150		0		
Surr: o-Terphenyl	17.8		20.98		84.9	50	150		0		

Sample ID 1611219-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33039							
Client ID: BATCH	Batch ID: 15507		Analysis Date: 11/22/2016	SeqNo: 626099							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	968	20.2						1,367	34.2	30	R
Heavy Oil	1,190	50.5						1,232	3.86	30	
Surr: 2-Fluorobiphenyl	19.1		20.20		94.6	50	150		0		

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1611219-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33039							
Client ID: BATCH	Batch ID: 15507	Analysis Date: 11/22/2016	SeqNo: 626099								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: o-Terphenyl	19.7		20.20		97.4	50	150		0		
-------------------	------	--	-------	--	------	----	-----	--	---	--	--

NOTES:

R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).

Sample ID 1611219-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33039							
Client ID: BATCH	Batch ID: 15507	Analysis Date: 11/22/2016	SeqNo: 626100								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	1,190	18.0	449.0	1,367	-39.9	65	135				S
Surr: 2-Fluorobiphenyl	19.4		17.96		108	50	150				
Surr: o-Terphenyl	21.2		17.96		118	50	150				

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1611219-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33039							
Client ID: BATCH	Batch ID: 15507	Analysis Date: 11/22/2016	SeqNo: 626101								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	920	19.4	485.4	1,367	-92.0	65	135	1,188	25.4	30	S
Surr: 2-Fluorobiphenyl	23.7		19.42		122	50	150		0		
Surr: o-Terphenyl	24.8		19.42		128	50	150		0		

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID LCS-15503	SampType: LCS	Units: mg/Kg			Prep Date: 11/21/2016	RunNo: 33046					
Client ID: LCSS	Batch ID: 15503				Analysis Date: 11/21/2016	SeqNo: 626243					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	25.6	5.00	25.00	0	102	65	135				
Surr: Toluene-d8	1.11		1.250		88.8	65	135				
Surr: 4-Bromofluorobenzene	0.812		1.250		64.9	65	135				S

NOTES:
S - Outlying surrogate recovery(ies) observed.

Sample ID MB-15503	SampType: MBLK	Units: mg/Kg			Prep Date: 11/21/2016	RunNo: 33046					
Client ID: MBLKS	Batch ID: 15503				Analysis Date: 11/21/2016	SeqNo: 626245					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.21		1.250		96.9	65	135				
Surr: 4-Bromofluorobenzene	0.985		1.250		78.8	65	135				

Sample ID 1611186-001BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 11/21/2016	RunNo: 33046					
Client ID: BATCH	Batch ID: 15503				Analysis Date: 11/21/2016	SeqNo: 626216					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	6.43						0		30	
Surr: Toluene-d8	2.00		1.607		125	65	135		0		
Surr: 4-Bromofluorobenzene	1.79		1.607		111	65	135		0		

Sample ID 1611201-001BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 11/21/2016	RunNo: 33046					
Client ID: BATCH	Batch ID: 15503				Analysis Date: 11/22/2016	SeqNo: 626229					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.75						0		30	
Surr: Toluene-d8	1.42		1.437		98.8	65	135		0		
Surr: 4-Bromofluorobenzene	1.29		1.437		90.1	65	135		0		

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Gasoline by NWTPH-Gx

Sample ID 1611216-014BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33046							
Client ID: TP-W14S36-7.5	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626237							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	24.8	5.99	29.93	0	83.0	65	135				
Surr: Toluene-d8	1.48		1.496		98.6	65	135				
Surr: 4-Bromofluorobenzene	1.25		1.496		83.7	65	135				

Sample ID 1611216-014BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33046							
Client ID: TP-W14S36-7.5	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626238							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	25.4	5.99	29.93	0	84.8	65	135	24.83	2.21	30	
Surr: Toluene-d8	1.50		1.496		100	65	135		0		
Surr: 4-Bromofluorobenzene	1.30		1.496		87.0	65	135		0		

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-15509	SampType: MBLK	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33057							
Client ID: MBLKS	Batch ID: 15509		Analysis Date: 11/22/2016	SeqNo: 626642							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.236

Sample ID LCS-15509	SampType: LCS	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33057							
Client ID: LCSS	Batch ID: 15509		Analysis Date: 11/22/2016	SeqNo: 626643							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.534 0.240 0.4808 0 111 80 120

Sample ID 1611216-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33057							
Client ID: TP-W3S5-5.0	Batch ID: 15509		Analysis Date: 11/22/2016	SeqNo: 626645							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.296 0 20

Sample ID 1611216-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33057							
Client ID: TP-W3S5-5.0	Batch ID: 15509		Analysis Date: 11/22/2016	SeqNo: 626646							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.762 0.280 0.5594 0.2193 97.0 70 130

Sample ID 1611216-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33057							
Client ID: TP-W3S5-5.0	Batch ID: 15509		Analysis Date: 11/22/2016	SeqNo: 626647							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.767 0.296 0.5911 0.2193 92.7 70 130 0.7620 0.693 20

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID MB-15505	SampType: MBLK	Units: µg/Kg	Prep Date: 11/21/2016	RunNo: 33048							
Client ID: MBLKS	Batch ID: 15505		Analysis Date: 11/21/2016	SeqNo: 626265							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	466		500.0		93.3	24.5	139				
Surr: Terphenyl-d14 (surr)	478		500.0		95.7	44.3	176				

Sample ID LCS-15505	SampType: LCS	Units: µg/Kg	Prep Date: 11/21/2016	RunNo: 33048							
Client ID: LCSS	Batch ID: 15505		Analysis Date: 11/21/2016	SeqNo: 626266							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,020	40.0	1,000	0	102	46.4	125				
2-Methylnaphthalene	1,080	40.0	1,000	0	108	45.1	135				
1-Methylnaphthalene	1,070	40.0	1,000	0	107	46.2	133				
Acenaphthylene	1,040	40.0	1,000	0	104	32.8	136				
Acenaphthene	1,040	40.0	1,000	0	104	38.7	129				

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID	LCS-15505	SampType:	LCS	Units:	µg/Kg	Prep Date:	11/21/2016	RunNo:	33048		
Client ID:	LCSS	Batch ID:	15505			Analysis Date:	11/21/2016	SeqNo:	626266		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	1,060	40.0	1,000	0	106	41.1	132				
Phenanthrene	1,080	40.0	1,000	0	108	43.9	133				
Anthracene	1,060	40.0	1,000	0	106	44.2	136				
Fluoranthene	1,050	40.0	1,000	0	105	45.9	137				
Pyrene	1,060	40.0	1,000	0	106	46.2	137				
Benz(a)anthracene	1,150	40.0	1,000	0	115	41.9	136				
Chrysene	1,090	40.0	1,000	0	109	46.9	138				
Benzo(b)fluoranthene	1,220	40.0	1,000	0	122	35.9	148				
Benzo(k)fluoranthene	1,270	40.0	1,000	0	127	43.9	144				Q+
Benzo(a)pyrene	1,300	40.0	1,000	0	130	36.3	144				Q+
Indeno(1,2,3-cd)pyrene	1,170	40.0	1,000	0	117	16.1	135				Q+
Dibenz(a,h)anthracene	1,160	40.0	1,000	0	116	17.2	136				Q+
Benzo(g,h,i)perylene	1,010	40.0	1,000	0	101	32.9	112				Q+
Surr: 2-Fluorobiphenyl	452		500.0		90.4	24.5	139				
Surr: Terphenyl-d14 (surr)	476		500.0		95.2	44.3	176				

NOTES:

Q+ - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF) - high bias

Sample ID	1611219-001ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	11/21/2016	RunNo:	33048		
Client ID:	BATCH	Batch ID:	15505			Analysis Date:	11/22/2016	SeqNo:	626279		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	936	41.7						526.6	56.0	30	R
2-Methylnaphthalene	2,080	41.7						1,654	23.0	30	
1-Methylnaphthalene	1,760	41.7						1,283	31.1	30	R
Acenaphthylene	106	41.7						64.40	49.1	30	R
Acenaphthene	1,720	41.7						656.1	89.6	30	R
Fluorene	1,380	41.7						577.0	82.3	30	R
Phenanthrene	5,130	41.7						1,936	90.4	30	R
Anthracene	786	41.7						339.2	79.5	30	R
Fluoranthene	1,650	41.7						446.1	115	30	R

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1611219-001ADUP	SampType: DUP	Units: µg/Kg-dry		Prep Date: 11/21/2016	RunNo: 33048						
Client ID: BATCH	Batch ID: 15505			Analysis Date: 11/22/2016	SeqNo: 626279						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pyrene	3,200	41.7						1,213	90.1	30	R
Benz(a)anthracene	687	41.7						334.6	69.0	30	R
Chrysene	1,490	41.7						645.6	79.2	30	R
Benzo(b)fluoranthene	281	41.7						146.4	62.9	30	R
Benzo(k)fluoranthene	56.8	41.7						53.07	6.86	30	Q+
Benzo(a)pyrene	581	41.7						335.6	53.6	30	RQ+
Indeno(1,2,3-cd)pyrene	485	41.7						269.8	57.0	30	RQ+,I
Dibenz(a,h)anthracene	303	41.7						148.8	68.1	30	RQ+,I
Benzo(g,h,i)perylene	1,470	41.7						799.0	59.3	30	RQ+,I
Surr: 2-Fluorobiphenyl	475		521.6		91.1	24.5	139		0		
Surr: Terphenyl-d14 (surr)	439		521.6		84.2	44.3	176		0		

NOTES:

- Q+ - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF) - high bias
- R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).
- I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.

Sample ID 1611219-001AMS	SampType: MS	Units: µg/Kg-dry		Prep Date: 11/21/2016	RunNo: 33048						
Client ID: BATCH	Batch ID: 15505			Analysis Date: 11/22/2016	SeqNo: 626280						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,710	40.1	1,002	526.6	118	42.9	138				
2-Methylnaphthalene	2,230	40.1	1,002	1,654	57.2	42.8	151				
1-Methylnaphthalene	1,900	40.1	1,002	1,283	61.1	41.6	148				
Acenaphthylene	1,130	40.1	1,002	64.40	107	32.6	160				
Acenaphthene	1,870	40.1	1,002	656.1	121	46.3	142				
Fluorene	1,710	40.1	1,002	577.0	113	43.4	153				
Phenanthrene	3,340	40.1	1,002	1,936	140	45.5	140				S
Anthracene	1,430	40.1	1,002	339.2	109	32.6	160				
Fluoranthene	1,700	40.1	1,002	446.1	125	44.6	161				
Pyrene	1,940	40.1	1,002	1,213	72.4	48.3	158				
Benz(a)anthracene	858	40.1	1,002	334.6	52.3	57.5	169				S

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1611219-001AMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33048							
Client ID: BATCH	Batch ID: 15505		Analysis Date: 11/22/2016	SeqNo: 626280							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chrysene	1,480	40.1	1,002	645.6	83.7	45.2	146				
Benzo(b)fluoranthene	778	40.1	1,002	146.4	63.0	42.2	168				
Benzo(k)fluoranthene	713	40.1	1,002	53.07	65.8	48	161				Q+
Benzo(a)pyrene	927	40.1	1,002	335.6	59.0	34.4	179				Q+
Indeno(1,2,3-cd)pyrene	2,340	40.1	1,002	269.8	206	5	113				SQ+,I
Dibenz(a,h)anthracene	2,790	40.1	1,002	148.8	264	5	100				SQ+,I
Benzo(g,h,i)perylene	2,960	40.1	1,002	799.0	215	45.6	157				SQ+,I
Surr: 2-Fluorobiphenyl	375		501.2		74.8	24.5	139				
Surr: Terphenyl-d14 (surr)	331		501.2		66.1	44.3	176				

NOTES:

Q+ - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF) - high bias

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.

Sample ID 1611219-001AMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33048							
Client ID: BATCH	Batch ID: 15505		Analysis Date: 11/22/2016	SeqNo: 626281							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	1,540	39.7	992.3	526.6	102	42.9	138	1,713	10.9	30	
2-Methylnaphthalene	2,070	39.7	992.3	1,654	41.9	42.8	151	2,228	7.37	30	S
1-Methylnaphthalene	1,780	39.7	992.3	1,283	49.8	41.6	148	1,895	6.46	30	
Acenaphthylene	1,110	39.7	992.3	64.40	105	32.6	160	1,133	2.30	30	
Acenaphthene	1,680	39.7	992.3	656.1	103	46.3	142	1,869	10.9	30	
Fluorene	1,540	39.7	992.3	577.0	96.6	43.4	153	1,708	10.6	30	
Phenanthrene	2,790	39.7	992.3	1,936	86.1	45.5	140	3,341	17.9	30	
Anthracene	1,350	39.7	992.3	339.2	102	32.6	160	1,430	5.85	30	
Fluoranthene	1,460	39.7	992.3	446.1	102	44.6	161	1,696	14.9	30	
Pyrene	1,970	39.7	992.3	1,213	75.9	48.3	158	1,939	1.40	30	
Benz(a)anthracene	835	39.7	992.3	334.6	50.5	57.5	169	858.4	2.71	30	S
Chrysene	1,450	39.7	992.3	645.6	80.9	45.2	146	1,484	2.44	30	
Benzo(b)fluoranthene	755	39.7	992.3	146.4	61.3	42.2	168	778.1	2.99	30	

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID 1611219-001AMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33048							
Client ID: BATCH	Batch ID: 15505	Analysis Date: 11/22/2016	SeqNo: 626281								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzo(k)fluoranthene	671	39.7	992.3	53.07	62.2	48	161	712.7	6.07	30	Q+
Benzo(a)pyrene	856	39.7	992.3	335.6	52.4	34.4	179	926.9	7.98	30	Q+
Indeno(1,2,3-cd)pyrene	2,330	39.7	992.3	269.8	207	5	113	2,340	0.489	30	SQ+,I
Dibenz(a,h)anthracene	2,630	39.7	992.3	148.8	250	5	100	2,795	6.13	30	SQ+,I
Benzo(g,h,i)perylene	2,660	39.7	992.3	799.0	187	45.6	157	2,958	10.8	30	SQ+,I
Surr: 2-Fluorobiphenyl	439		496.2		88.5	24.5	139		0		
Surr: Terphenyl-d14 (surr)	408		496.2		82.1	44.3	176		0		

NOTES:

- Q+ - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF) - high bias
- S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.
- I - Indicates an analyte with an internal standard that does not meet established acceptance criteria.



Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID 1611220-004ADUP	SampType: DUP	Units: wt%	Prep Date: 11/22/2016	RunNo: 33041							
Client ID: BATCH	Batch ID: R33041	Analysis Date: 11/22/2016	SeqNo: 626131								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	8.26	0.500						8.177	1.02	20	

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-15512	SampType: MBLK	Units: mg/Kg	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: MBLKS	Batch ID: 15512		Analysis Date: 11/22/2016	SeqNo: 626572							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.0787									
Barium	ND	0.394									
Cadmium	ND	0.157									
Chromium	ND	0.0787									
Lead	ND	0.157									
Selenium	ND	0.394									
Silver	ND	0.0787									

Sample ID LCS-15512	SampType: LCS	Units: mg/Kg	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: LCSS	Batch ID: 15512		Analysis Date: 11/22/2016	SeqNo: 626573							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	39.7	0.0775	38.76	0	103	80	120				
Barium	40.6	0.388	38.76	0	105	80	120				
Cadmium	1.94	0.155	1.938	0	100	80	120				
Chromium	38.7	0.0775	38.76	0	99.7	80	120				
Lead	18.9	0.155	19.38	0	97.6	80	120				
Selenium	3.70	0.388	3.876	0	95.4	80	120				
Silver	1.71	0.0775	1.938	0	88.1	80	120				

Sample ID 1611201-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: BATCH	Batch ID: 15512		Analysis Date: 11/22/2016	SeqNo: 626575							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	2.21	0.0894						2.762	22.3	20	R
Barium	96.3	0.447						124.1	25.2	20	R
Cadmium	ND	0.179						0		20	
Chromium	30.6	0.0894						34.48	12.0	20	
Lead	20.4	0.179						16.88	18.9	20	
Selenium	0.901	0.447						0.8343	7.71	20	

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1611201-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: BATCH	Batch ID: 15512	Analysis Date: 11/22/2016	SeqNo: 626575								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Silver	ND	0.0894						0		20	

NOTES:

R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID 1611201-001AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: BATCH	Batch ID: 15512	Analysis Date: 11/22/2016	SeqNo: 626577								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	53.0	0.0922	46.09	2.762	109	75	125				
Barium	177	0.461	46.09	124.1	115	75	125				
Cadmium	2.12	0.184	2.304	0.08030	88.3	75	125				
Chromium	108	0.0922	46.09	34.48	159	75	125				S
Lead	42.7	0.184	23.04	16.88	112	75	125				
Selenium	5.48	0.461	4.609	0.8343	101	75	125				
Silver	1.63	0.0922	2.304	0.05836	68.1	75	125				S

NOTES:

S - Outlying spike recovery observed (Ag). A duplicate analysis was performed with similar results indicating a possible matrix effect.

S - Outlying spike recovery observed (Cr). A duplicate analysis was performed and recovered within range.

Sample ID 1611201-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: BATCH	Batch ID: 15512	Analysis Date: 11/22/2016	SeqNo: 626578								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.5	0.0922	46.09	2.762	106	75	125	52.99	2.87	20	
Barium	143	0.461	46.09	124.1	42.0	75	125	177.3	21.1	20	RS
Cadmium	1.93	0.184	2.304	0.08030	80.1	75	125	2.115	9.41	20	
Chromium	83.7	0.0922	46.09	34.48	107	75	125	107.9	25.3	20	R
Lead	37.4	0.184	23.04	16.88	88.9	75	125	42.67	13.2	20	
Selenium	5.08	0.461	4.609	0.8343	92.2	75	125	5.477	7.46	20	
Silver	1.46	0.0922	2.304	0.05836	61.0	75	125	1.627	10.5	20	S

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID 1611201-001AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: BATCH	Batch ID: 15512	Analysis Date: 11/22/2016	SeqNo: 626578								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

- S - Outlying spike recovery observed (Ag). A duplicate analysis was performed with similar results indicating a possible matrix effect.
- S - Outlying spike recovery observed (Ba). A duplicate analysis was performed and recovered within range.
- R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID 1611201-001APDS	SampType: PDS	Units: mg/Kg-dry	Prep Date: 11/22/2016	RunNo: 33054							
Client ID: BATCH	Batch ID: 15512	Analysis Date: 11/22/2016	SeqNo: 626579								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Silver	1.63	0.0861	2.15	0.0584	73.0	80	120				S
--------	------	--------	------	--------	------	----	-----	--	--	--	---

NOTES:

- S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 1611216
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15503	SampType:	LCS	Units:	mg/Kg	Prep Date:	11/21/2016	RunNo:	33045		
Client ID:	LCSS	Batch ID:	15503	Analysis Date:	11/21/2016	SeqNo:	626212				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.734	0.0600	1.000	0	73.4	34.5	141				
Chloromethane	0.712	0.0600	1.000	0	71.2	38.8	132				
Vinyl chloride	0.756	0.00200	1.000	0	75.6	44	142				
Bromomethane	0.809	0.0900	1.000	0	80.9	40.9	157				
Trichlorofluoromethane (CFC-11)	0.812	0.0500	1.000	0	81.2	41.7	153				Q
Chloroethane	0.768	0.0600	1.000	0	76.8	37.1	144				Q
1,1-Dichloroethene	0.898	0.0500	1.000	0	89.8	49.7	142				Q
Methylene chloride	1.02	0.0200	1.000	0	102	46.3	140				
trans-1,2-Dichloroethene	1.01	0.0200	1.000	0	101	68	130				
Methyl tert-butyl ether (MTBE)	0.897	0.0500	1.000	0	89.7	59.1	138				
1,1-Dichloroethane	0.989	0.0200	1.000	0	98.9	61.9	137				
2,2-Dichloropropane	1.03	0.0500	1.000	0	103	28.1	149				
cis-1,2-Dichloroethene	1.00	0.0200	1.000	0	100	71.3	135				
Chloroform	0.994	0.0200	1.000	0	99.4	67.5	129				B
1,1,1-Trichloroethane (TCA)	0.956	0.0200	1.000	0	95.6	69	132				
1,1-Dichloropropene	1.01	0.0200	1.000	0	101	72.7	131				
Carbon tetrachloride	0.993	0.0200	1.000	0	99.3	63.4	137				
1,2-Dichloroethane (EDC)	0.942	0.0300	1.000	0	94.2	61.9	136				
Benzene	0.990	0.0200	1.000	0	99.0	64.3	133				
Trichloroethene (TCE)	0.948	0.0200	1.000	0	94.8	65.5	137				
1,2-Dichloropropane	1.04	0.0200	1.000	0	104	63.2	142				
Bromodichloromethane	0.978	0.0200	1.000	0	97.8	73.2	131				
Dibromomethane	0.956	0.0400	1.000	0	95.6	70	130				
cis-1,3-Dichloropropene	1.00	0.0200	1.000	0	100	59.1	143				
Toluene	1.07	0.0200	1.000	0	107	67.3	138				
trans-1,3-Dichloropropylene	0.974	0.0300	1.000	0	97.4	49.2	149				
1,1,2-Trichloroethane	1.03	0.0300	1.000	0	103	74.5	129				
1,3-Dichloropropane	1.02	0.0500	1.000	0	102	70	130				
Tetrachloroethene (PCE)	1.06	0.0200	1.000	0	106	52.7	150				
Dibromochloromethane	1.02	0.0300	1.000	0	102	70.6	144				
1,2-Dibromoethane (EDB)	0.984	0.00500	1.000	0	98.4	70	130				

Work Order: 1611216
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	LCS-15503	SampType:	LCS	Units:	mg/Kg	Prep Date:	11/21/2016	RunNo:	33045		
Client ID:	LCSS	Batch ID:	15503	Analysis Date:	11/21/2016	SeqNo:	626212				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	0.992	0.0200	1.000	0	99.2	76.1	123				
1,1,1,2-Tetrachloroethane	0.962	0.0300	1.000	0	96.2	65.9	141				
Ethylbenzene	0.986	0.0300	1.000	0	98.6	74	129				
m,p-Xylene	1.96	0.0200	2.000	0	98.1	70	124				
o-Xylene	1.03	0.0200	1.000	0	103	72.7	124				
Styrene	0.976	0.0200	1.000	0	97.6	76.8	130				
Isopropylbenzene	0.966	0.0800	1.000	0	96.6	70	130				
Bromoform	0.887	0.0200	1.000	0	88.7	67	154				
1,1,2,2-Tetrachloroethane	0.952	0.0200	1.000	0	95.2	60	130				
n-Propylbenzene	0.992	0.0200	1.000	0	99.2	74.8	125				
Bromobenzene	0.982	0.0300	1.000	0	98.2	49.2	144				
1,3,5-Trimethylbenzene	0.940	0.0200	1.000	0	94.0	74.6	123				
2-Chlorotoluene	0.966	0.0200	1.000	0	96.6	76.7	129				
4-Chlorotoluene	0.968	0.0200	1.000	0	96.8	77.5	125				
tert-Butylbenzene	0.919	0.0200	1.000	0	91.9	66.2	130				
1,2,3-Trichloropropane	0.914	0.0200	1.000	0	91.4	67.9	136				
1,2,4-Trichlorobenzene	0.843	0.0500	1.000	0	84.3	62.6	143				
sec-Butylbenzene	0.962	0.0200	1.000	0	96.2	75.6	133				
4-Isopropyltoluene	0.912	0.0200	1.000	0	91.2	76.8	131				
1,3-Dichlorobenzene	1.07	0.0200	1.000	0	107	72.8	128				
1,4-Dichlorobenzene	1.08	0.0200	1.000	0	108	72.6	126				
n-Butylbenzene	0.958	0.0200	1.000	0	95.8	65.3	136				Q
1,2-Dichlorobenzene	0.925	0.0200	1.000	0	92.5	72.8	126				Q
1,2-Dibromo-3-chloropropane	0.874	0.500	1.000	0	87.4	61.2	139				
1,2,4-Trimethylbenzene	0.942	0.0200	1.000	0	94.2	77.5	129				
Hexachlorobutadiene	0.429	0.100	1.000	0	42.8	42	151				
Naphthalene	0.879	0.0300	1.000	0	87.9	62.3	134				
1,2,3-Trichlorobenzene	0.813	0.0200	1.000	0	81.3	54.8	143				
Surr: Dibromofluoromethane	1.21		1.250		96.9	56.5	129				
Surr: Toluene-d8	1.26		1.250		100	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.28		1.250		102	63.1	141				

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID LCS-15503	SampType: LCS	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: LCSS	Batch ID: 15503		Analysis Date: 11/21/2016	SeqNo: 626212							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID MB-15503	SampType: MBLK	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: MBLKS	Batch ID: 15503		Analysis Date: 11/21/2016	SeqNo: 626213							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0600									
Chloromethane	ND	0.0600									
Vinyl chloride	ND	0.00200									
Bromomethane	ND	0.0900									
Trichlorofluoromethane (CFC-11)	ND	0.0500									Q
Chloroethane	ND	0.0600									Q
1,1-Dichloroethene	ND	0.0500									Q
Methylene chloride	ND	0.0200									
trans-1,2-Dichloroethene	ND	0.0200									
Methyl tert-butyl ether (MTBE)	ND	0.0500									
1,1-Dichloroethane	ND	0.0200									
2,2-Dichloropropane	ND	0.0500									
cis-1,2-Dichloroethene	ND	0.0200									
Chloroform	0.0380	0.0200									
1,1,1-Trichloroethane (TCA)	ND	0.0200									
1,1-Dichloropropene	ND	0.0200									
Carbon tetrachloride	ND	0.0200									
1,2-Dichloroethane (EDC)	ND	0.0300									
Benzene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									
1,2-Dichloropropane	ND	0.0200									
Bromodichloromethane	ND	0.0200									
Dibromomethane	ND	0.0400									
cis-1,3-Dichloropropene	ND	0.0200									

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15503	SampType: MBLK	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: MBLKS	Batch ID: 15503		Analysis Date: 11/21/2016	SeqNo: 626213							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	ND	0.0200									
trans-1,3-Dichloropropylene	ND	0.0300									
1,1,2-Trichloroethane	ND	0.0300									
1,3-Dichloropropane	ND	0.0500									
Tetrachloroethene (PCE)	ND	0.0200									
Dibromochloromethane	ND	0.0300									
1,2-Dibromoethane (EDB)	ND	0.00500									
Chlorobenzene	ND	0.0200									
1,1,1,2-Tetrachloroethane	ND	0.0300									
Ethylbenzene	ND	0.0300									
m,p-Xylene	ND	0.0200									
o-Xylene	ND	0.0200									
Styrene	ND	0.0200									
Isopropylbenzene	ND	0.0800									
Bromoform	ND	0.0200									
1,1,2,2-Tetrachloroethane	ND	0.0200									
n-Propylbenzene	ND	0.0200									
Bromobenzene	ND	0.0300									
1,3,5-Trimethylbenzene	ND	0.0200									
2-Chlorotoluene	ND	0.0200									
4-Chlorotoluene	ND	0.0200									
tert-Butylbenzene	ND	0.0200									
1,2,3-Trichloropropane	ND	0.0200									
1,2,4-Trichlorobenzene	ND	0.0500									
sec-Butylbenzene	ND	0.0200									
4-Isopropyltoluene	ND	0.0200									
1,3-Dichlorobenzene	ND	0.0200									
1,4-Dichlorobenzene	ND	0.0200									
n-Butylbenzene	ND	0.0200									Q
1,2-Dichlorobenzene	ND	0.0200									Q
1,2-Dibromo-3-chloropropane	ND	0.500									

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID MB-15503	SampType: MBLK	Units: mg/Kg	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: MBLKS	Batch ID: 15503		Analysis Date: 11/21/2016	SeqNo: 626213							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2,4-Trimethylbenzene	ND	0.0200									
Hexachlorobutadiene	ND	0.100									
Naphthalene	ND	0.0300									
1,2,3-Trichlorobenzene	ND	0.0200									
Surr: Dibromofluoromethane	1.23		1.250		98.3	56.5	129				
Surr: Toluene-d8	1.64		1.250		132	64.3	131				S
Surr: 1-Bromo-4-fluorobenzene	1.17		1.250		93.6	63.1	141				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).
S - Outlying surrogate recovery(ies) observed.

Sample ID 1611186-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/21/2016	SeqNo: 626189							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0771						0		30	
Chloromethane	ND	0.0771						0		30	
Vinyl chloride	ND	0.00257						0		30	
Bromomethane	ND	0.116						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0643						0		30	Q
Chloroethane	ND	0.0771						0		30	Q
1,1-Dichloroethene	ND	0.0643						0		30	Q
Methylene chloride	ND	0.0257						0		30	
trans-1,2-Dichloroethene	ND	0.0257						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0643						0		30	
1,1-Dichloroethane	ND	0.0257						0		30	
2,2-Dichloropropane	ND	0.0643						0		30	
cis-1,2-Dichloroethene	ND	0.0257						0		30	
Chloroform	ND	0.0257						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0257						0		30	
1,1-Dichloropropene	ND	0.0257						0		30	

Work Order: 1611216
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1611186-001BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	11/21/2016	RunNo:	33045		
Client ID:	BATCH	Batch ID:	15503			Analysis Date:	11/21/2016	SeqNo:	626189		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Carbon tetrachloride	ND	0.0257						0		30	
1,2-Dichloroethane (EDC)	ND	0.0386						0		30	
Benzene	ND	0.0257						0		30	
Trichloroethene (TCE)	ND	0.0257						0		30	
1,2-Dichloropropane	ND	0.0257						0		30	
Bromodichloromethane	ND	0.0257						0		30	
Dibromomethane	ND	0.0514						0		30	
cis-1,3-Dichloropropene	ND	0.0257						0		30	
Toluene	ND	0.0257						0		30	
trans-1,3-Dichloropropylene	ND	0.0386						0		30	
1,1,2-Trichloroethane	ND	0.0386						0		30	
1,3-Dichloropropane	ND	0.0643						0		30	
Tetrachloroethene (PCE)	ND	0.0257						0		30	
Dibromochloromethane	ND	0.0386						0		30	
1,2-Dibromoethane (EDB)	ND	0.00643						0		30	
Chlorobenzene	ND	0.0257						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0386						0		30	
Ethylbenzene	ND	0.0386						0		30	
m,p-Xylene	ND	0.0257						0		30	
o-Xylene	ND	0.0257						0		30	
Styrene	ND	0.0257						0		30	
Isopropylbenzene	ND	0.103						0		30	
Bromoform	ND	0.0257						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0257						0		30	
n-Propylbenzene	ND	0.0257						0		30	
Bromobenzene	ND	0.0386						0		30	
1,3,5-Trimethylbenzene	ND	0.0257						0		30	
2-Chlorotoluene	ND	0.0257						0		30	
4-Chlorotoluene	ND	0.0257						0		30	
tert-Butylbenzene	ND	0.0257						0		30	
1,2,3-Trichloropropane	ND	0.0257						0		30	

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1611186-001BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	11/21/2016	RunNo:	33045		
Client ID:	BATCH	Batch ID:	15503	Analysis Date:	11/21/2016	SeqNo:	626189				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	ND	0.0643						0		30	
sec-Butylbenzene	ND	0.0257						0		30	
4-Isopropyltoluene	ND	0.0257						0		30	
1,3-Dichlorobenzene	ND	0.0257						0		30	
1,4-Dichlorobenzene	ND	0.0257						0		30	
n-Butylbenzene	ND	0.0257						0		30	Q
1,2-Dichlorobenzene	ND	0.0257						0		30	Q
1,2-Dibromo-3-chloropropane	ND	0.643						0		30	
1,2,4-Trimethylbenzene	ND	0.0257						0		30	
Hexachlorobutadiene	ND	0.129						0		30	
Naphthalene	ND	0.0386						0		30	
1,2,3-Trichlorobenzene	ND	0.0257						0		30	
Surr: Dibromofluoromethane	1.54		1.607		95.5	56.5	129		0		
Surr: Toluene-d8	1.42		1.607		88.1	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	2.13		1.607		132	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	1611186-010BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	11/21/2016	RunNo:	33045		
Client ID:	BATCH	Batch ID:	15503	Analysis Date:	11/22/2016	SeqNo:	626199				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	1.64	0.0796	1.327	0	124	43.5	121				S
Chloromethane	1.32	0.0796	1.327	0	99.7	45	130				
Vinyl chloride	1.08	0.00265	1.327	0	81.4	51.2	146				
Bromomethane	0.373	0.119	1.327	0	28.1	21.3	120				
Trichlorofluoromethane (CFC-11)	0.385	0.0664	1.327	0	29.0	35	131				SQ
Chloroethane	0.173	0.0796	1.327	0	13.0	43.8	117				SQ
1,1-Dichloroethene	0.316	0.0664	1.327	0	23.8	61.9	141				SQ
Methylene chloride	1.13	0.0265	1.327	0	84.8	54.7	142				
trans-1,2-Dichloroethene	0.981	0.0265	1.327	0	73.9	52	136				

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1611186-010BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626199							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.06	0.0664	1.327	0	79.9	54.4	132				
1,1-Dichloroethane	0.972	0.0265	1.327	0	73.2	51.8	141				
2,2-Dichloropropane	0.906	0.0664	1.327	0	68.3	36	123				
cis-1,2-Dichloroethene	1.03	0.0265	1.327	0	77.8	58.6	136				
Chloroform	0.984	0.0265	1.327	0.02456	72.3	53.2	129				B
1,1,1-Trichloroethane (TCA)	0.986	0.0265	1.327	0	74.2	58.3	145				
1,1-Dichloropropene	1.09	0.0265	1.327	0	82.0	55.1	138				
Carbon tetrachloride	1.05	0.0265	1.327	0	79.0	53.3	144				
1,2-Dichloroethane (EDC)	0.978	0.0398	1.327	0	73.7	51.3	139				
Benzene	1.33	0.0265	1.327	0	101	63.5	133				
Trichloroethene (TCE)	1.24	0.0265	1.327	0	93.4	68.6	132				
1,2-Dichloropropane	1.18	0.0265	1.327	0	88.7	59	136				
Bromodichloromethane	1.11	0.0265	1.327	0	83.6	50.7	141				
Dibromomethane	1.24	0.0531	1.327	0	93.2	50.6	137				
cis-1,3-Dichloropropene	1.24	0.0265	1.327	0	93.6	50.4	138				
Toluene	1.24	0.0265	1.327	0	93.4	63.4	132				
trans-1,3-Dichloropropylene	1.11	0.0398	1.327	0	84.0	44.1	147				
1,1,2-Trichloroethane	1.22	0.0398	1.327	0	92.1	51.6	137				
1,3-Dichloropropane	1.18	0.0664	1.327	0	89.1	53.1	134				
Tetrachloroethene (PCE)	1.12	0.0265	1.327	0	84.7	35.6	158				
Dibromochloromethane	1.13	0.0398	1.327	0	85.2	55.3	140				
1,2-Dibromoethane (EDB)	1.38	0.00664	1.327	0	104	50.4	136				
Chlorobenzene	1.25	0.0265	1.327	0	94.5	60	133				
1,1,1,2-Tetrachloroethane	1.13	0.0398	1.327	0	85.4	53.1	142				
Ethylbenzene	1.20	0.0398	1.327	0	90.1	54.5	134				
m,p-Xylene	2.39	0.0265	2.655	0	90.1	53.1	132				
o-Xylene	1.20	0.0265	1.327	0	90.1	53.3	139				
Styrene	1.25	0.0265	1.327	0	93.8	51.1	132				
Isopropylbenzene	1.16	0.106	1.327	0	87.6	58.9	138				
Bromoform	1.27	0.0265	1.327	0	96.0	57.9	130				
1,1,2,2-Tetrachloroethane	1.28	0.0265	1.327	0	96.7	51.9	131				

Work Order: 1611216
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID	1611186-010BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	11/21/2016	RunNo:	33045	Client ID:	BATCH	Batch ID:	15503	Analysis Date:	11/22/2016	SeqNo:	626199
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual						
n-Propylbenzene	1.20	0.0265	1.327	0	90.8	53.6	140										
Bromobenzene	1.32	0.0398	1.327	0	99.1	54.2	140										
1,3,5-Trimethylbenzene	1.15	0.0265	1.327	0	86.5	51.8	136										
2-Chlorotoluene	1.13	0.0265	1.327	0	85.2	51.6	136										
4-Chlorotoluene	1.18	0.0265	1.327	0	89.1	50.1	139										
tert-Butylbenzene	1.15	0.0265	1.327	0	87.0	50.5	135										
1,2,3-Trichloropropane	1.11	0.0265	1.327	0	83.3	50.5	131										
1,2,4-Trichlorobenzene	1.80	0.0664	1.327	0	136	50.8	130				S						
sec-Butylbenzene	1.19	0.0265	1.327	0	90.0	52.6	141										
4-Isopropyltoluene	1.14	0.0265	1.327	0	86.2	52.9	134										
1,3-Dichlorobenzene	1.29	0.0265	1.327	0	97.0	52.6	131										
1,4-Dichlorobenzene	1.23	0.0265	1.327	0	92.6	52.9	129										
n-Butylbenzene	1.28	0.0265	1.327	0	96.8	52.6	130				Q						
1,2-Dichlorobenzene	1.35	0.0265	1.327	0	102	55.8	129				Q						
1,2-Dibromo-3-chloropropane	1.45	0.664	1.327	0	109	40.5	131										
1,2,4-Trimethylbenzene	1.23	0.0265	1.327	0	93.0	50.6	137										
Hexachlorobutadiene	0.230	0.133	1.327	0	17.3	40.6	158				S						
Naphthalene	1.78	0.0398	1.327	0	134	52.3	124				S						
1,2,3-Trichlorobenzene	1.90	0.0265	1.327	0	143	54.4	124				S						
Surr: Dibromofluoromethane	1.45		1.659		87.2	56.5	129										
Surr: Toluene-d8	1.71		1.659		103	64.3	131										
Surr: 1-Bromo-4-fluorobenzene	1.72		1.659		103	63.1	141										

NOTES:

S - Outlying spike recovery(ies) observed. The method is in control as indicated by the Laboratory Control Sample (LCS).

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID	1611186-010BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	11/21/2016	RunNo:	33045	Client ID:	BATCH	Batch ID:	15503	Analysis Date:	11/22/2016	SeqNo:	626200
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual						
Dichlorodifluoromethane (CFC-12)	1.26	0.0796	1.327	0	95.3	43.5	121	1.642	26.0	30							

Work Order: 1611216
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1611186-010BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626200

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloromethane	1.57	0.0796	1.327	0	119	45	130	1.323	17.4	30	
Vinyl chloride	1.51	0.00265	1.327	0	114	51.2	146	1.080	33.0	30	R
Bromomethane	0.993	0.119	1.327	0	74.8	21.3	120	0.3730	90.8	30	R
Trichlorofluoromethane (CFC-11)	1.14	0.0664	1.327	0	85.9	35	131	0.3849	99.0	30	RQ
Chloroethane	0.983	0.0796	1.327	0	74.1	43.8	117	0.1726	140	30	RQ
1,1-Dichloroethene	1.18	0.0664	1.327	0	89.1	61.9	141	0.3159	116	30	RQ
Methylene chloride	1.43	0.0265	1.327	0	108	54.7	142	1.126	23.8	30	
trans-1,2-Dichloroethene	1.48	0.0265	1.327	0	112	52	136	0.9809	40.7	30	R
Methyl tert-butyl ether (MTBE)	1.45	0.0664	1.327	0	110	54.4	132	1.061	31.3	30	R
1,1-Dichloroethane	1.55	0.0265	1.327	0	117	51.8	141	0.9716	46.0	30	R
2,2-Dichloropropane	1.49	0.0664	1.327	0	112	36	123	0.9059	48.5	30	R
cis-1,2-Dichloroethene	1.73	0.0265	1.327	0	131	58.6	136	1.033	50.6	30	R
Chloroform	1.56	0.0265	1.327	0.02456	116	53.2	129	0.9836	45.5	30	BR
1,1,1-Trichloroethane (TCA)	1.36	0.0265	1.327	0	102	58.3	145	0.9856	31.6	30	R
1,1-Dichloropropene	1.33	0.0265	1.327	0	100	55.1	138	1.088	19.9	30	
Carbon tetrachloride	1.31	0.0265	1.327	0	98.4	53.3	144	1.049	21.8	30	
1,2-Dichloroethane (EDC)	1.45	0.0398	1.327	0	110	51.3	139	0.9776	39.2	30	R
Benzene	1.31	0.0265	1.327	0	98.5	63.5	133	1.334	2.01	30	
Trichloroethene (TCE)	1.17	0.0265	1.327	0	88.5	68.6	132	1.239	5.39	30	
1,2-Dichloropropane	1.59	0.0265	1.327	0	120	59	136	1.177	29.7	30	
Bromodichloromethane	1.37	0.0265	1.327	0	104	50.7	141	1.110	21.3	30	
Dibromomethane	1.29	0.0531	1.327	0	97.6	50.6	137	1.237	4.56	30	
cis-1,3-Dichloropropene	1.67	0.0265	1.327	0	126	50.4	138	1.242	29.4	30	
Toluene	1.72	0.0265	1.327	0	130	63.4	132	1.239	32.6	30	R
trans-1,3-Dichloropropylene	1.62	0.0398	1.327	0	122	44.1	147	1.115	37.1	30	R
1,1,2-Trichloroethane	1.83	0.0398	1.327	0	138	51.6	137	1.222	39.8	30	RS
1,3-Dichloropropane	1.71	0.0664	1.327	0	129	53.1	134	1.183	36.4	30	R
Tetrachloroethene (PCE)	1.56	0.0265	1.327	0	117	35.6	158	1.124	32.3	30	R
Dibromochloromethane	1.39	0.0398	1.327	0	104	55.3	140	1.131	20.3	30	
1,2-Dibromoethane (EDB)	1.33	0.00664	1.327	0	100	50.4	136	1.378	3.68	30	
Chlorobenzene	1.28	0.0265	1.327	0	96.2	60	133	1.254	1.73	30	

Work Order: 1611216
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1611186-010BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626200

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	1.27	0.0398	1.327	0	95.6	53.1	142	1.134	11.2	30	
Ethylbenzene	1.25	0.0398	1.327	0	94.5	54.5	134	1.195	4.77	30	
m,p-Xylene	2.48	0.0265	2.655	0	93.4	53.1	132	2.391	3.60	30	
o-Xylene	1.24	0.0265	1.327	0	93.2	53.3	139	1.196	3.33	30	
Styrene	1.31	0.0265	1.327	0	98.8	51.1	132	1.245	5.19	30	
Isopropylbenzene	1.24	0.106	1.327	0	93.4	58.9	138	1.163	6.36	30	
Bromoform	1.28	0.0265	1.327	0	96.6	57.9	130	1.274	0.571	30	
1,1,2,2-Tetrachloroethane	1.22	0.0265	1.327	0	92.0	51.9	131	1.284	4.98	30	
n-Propylbenzene	1.27	0.0265	1.327	0	96.0	53.6	140	1.205	5.57	30	
Bromobenzene	1.27	0.0398	1.327	0	95.8	54.2	140	1.315	3.44	30	
1,3,5-Trimethylbenzene	1.26	0.0265	1.327	0	95.3	51.8	136	1.148	9.63	30	
2-Chlorotoluene	1.30	0.0265	1.327	0	97.9	51.6	136	1.132	13.8	30	
4-Chlorotoluene	1.33	0.0265	1.327	0	101	50.1	139	1.182	12.1	30	
tert-Butylbenzene	1.27	0.0265	1.327	0	95.8	50.5	135	1.154	9.69	30	
1,2,3-Trichloropropane	1.20	0.0265	1.327	0	90.1	50.5	131	1.106	7.79	30	
1,2,4-Trichlorobenzene	1.52	0.0664	1.327	0	114	50.8	130	1.804	17.2	30	
sec-Butylbenzene	1.38	0.0265	1.327	0	104	52.6	141	1.195	14.6	30	
4-Isopropyltoluene	1.27	0.0265	1.327	0	96.1	52.9	134	1.145	10.8	30	
1,3-Dichlorobenzene	1.35	0.0265	1.327	0	102	52.6	131	1.287	4.98	30	
1,4-Dichlorobenzene	1.36	0.0265	1.327	0	103	52.9	129	1.230	10.4	30	
n-Butylbenzene	1.23	0.0265	1.327	0	92.9	52.6	130	1.285	4.11	30	Q
1,2-Dichlorobenzene	1.21	0.0265	1.327	0	91.3	55.8	129	1.352	10.9	30	Q
1,2-Dibromo-3-chloropropane	1.56	0.664	1.327	0	117	40.5	131	1.451	7.10	30	
1,2,4-Trimethylbenzene	1.26	0.0265	1.327	0	94.8	50.6	137	1.234	2.02	30	
Hexachlorobutadiene	1.41	0.133	1.327	0	106	40.6	158	0.2296	144	30	R
Naphthalene	1.74	0.0398	1.327	0	131	52.3	124	1.778	1.88	30	S
1,2,3-Trichlorobenzene	1.62	0.0265	1.327	0	122	54.4	124	1.904	16.4	30	
Surr: Dibromofluoromethane	1.77		1.659		107	56.5	129		0		
Surr: Toluene-d8	2.14		1.659		129	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.78		1.659		107	63.1	141		0		

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1611186-010BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626200							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

- S - Outlying spike recovery(ies) observed. The method is in control as indicated by the Laboratory Control Sample (LCS).
- R - High RPD observed. The method is in control as indicated by the LCS.
- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Sample ID 1611201-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626202							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	ND	0.0690						0		30	
Chloromethane	ND	0.0690						0		30	
Vinyl chloride	ND	0.00230						0		30	
Bromomethane	ND	0.103						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0575						0		30	Q
Chloroethane	ND	0.0690						0		30	Q
1,1-Dichloroethene	ND	0.0575						0		30	Q
Methylene chloride	ND	0.0230						0		30	
trans-1,2-Dichloroethene	ND	0.0230						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0575						0		30	
1,1-Dichloroethane	ND	0.0230						0		30	
2,2-Dichloropropane	ND	0.0575						0		30	
cis-1,2-Dichloroethene	ND	0.0230						0		30	
Chloroform	ND	0.0230						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0230						0		30	
1,1-Dichloropropene	ND	0.0230						0		30	
Carbon tetrachloride	ND	0.0230						0		30	
1,2-Dichloroethane (EDC)	ND	0.0345						0		30	
Benzene	ND	0.0230						0		30	
Trichloroethene (TCE)	ND	0.0230						0		30	
1,2-Dichloropropane	ND	0.0230						0		30	
Bromodichloromethane	ND	0.0230						0		30	

Work Order: 1611216
CLIENT: GeoEngineers
Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1611201-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626202							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dibromomethane	ND	0.0460						0		30	
cis-1,3-Dichloropropene	ND	0.0230						0		30	
Toluene	ND	0.0230						0		30	
trans-1,3-Dichloropropylene	ND	0.0345						0		30	
1,1,2-Trichloroethane	ND	0.0345						0		30	
1,3-Dichloropropane	ND	0.0575						0		30	
Tetrachloroethene (PCE)	ND	0.0230						0		30	
Dibromochloromethane	ND	0.0345						0		30	
1,2-Dibromoethane (EDB)	ND	0.00575						0		30	
Chlorobenzene	ND	0.0230						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0345						0		30	
Ethylbenzene	ND	0.0345						0		30	
m,p-Xylene	ND	0.0230						0		30	
o-Xylene	ND	0.0230						0		30	
Styrene	ND	0.0230						0		30	
Isopropylbenzene	ND	0.0920						0		30	
Bromoform	ND	0.0230						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0230						0		30	
n-Propylbenzene	ND	0.0230						0		30	
Bromobenzene	ND	0.0345						0		30	
1,3,5-Trimethylbenzene	ND	0.0230						0		30	
2-Chlorotoluene	ND	0.0230						0		30	
4-Chlorotoluene	ND	0.0230						0		30	
tert-Butylbenzene	ND	0.0230						0		30	
1,2,3-Trichloropropane	ND	0.0230						0		30	
1,2,4-Trichlorobenzene	ND	0.0575						0		30	
sec-Butylbenzene	ND	0.0230						0		30	
4-Isopropyltoluene	ND	0.0230						0		30	
1,3-Dichlorobenzene	ND	0.0230						0		30	
1,4-Dichlorobenzene	ND	0.0230						0		30	
n-Butylbenzene	ND	0.0230						0		30	

Work Order: 1611216
 CLIENT: GeoEngineers
 Project: Rufus Block 20

QC SUMMARY REPORT
Volatile Organic Compounds by EPA Method 8260C

Sample ID 1611201-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 11/21/2016	RunNo: 33045							
Client ID: BATCH	Batch ID: 15503		Analysis Date: 11/22/2016	SeqNo: 626202							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2-Dichlorobenzene	ND	0.0230						0		30	
1,2-Dibromo-3-chloropropane	ND	0.575						0		30	
1,2,4-Trimethylbenzene	ND	0.0230						0		30	
Hexachlorobutadiene	ND	0.115						0		30	
Naphthalene	ND	0.0345						0		30	
1,2,3-Trichlorobenzene	ND	0.0230						0		30	
Surr: Dibromofluoromethane	1.40		1.437		97.6	56.5	129		0		
Surr: Toluene-d8	1.60		1.437		112	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.53		1.437		106	63.1	141		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF).

Client Name: **GEI**
 Logged by: **Erica Silva**

Work Order Number: **1611216**
 Date Received: **11/21/2016 1:20:00 PM**

Chain of Custody

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

Log In

3. Coolers are present? Yes No NA
 4. Shipping container/cooler in good condition? Yes No
 5. Custody Seals present on shipping container/cooler?
 (Refer to comments for Custody Seals not intact) Yes No Not Required
 6. Was an attempt made to cool the samples? Yes No NA

Unknown prior to receipt

7. Were all items received at a temperature of >0°C to 10.0°C* Yes No NA

Please refer to Item Information

8. Sample(s) in proper container(s)? Yes No
 9. Sufficient sample volume for indicated test(s)? Yes No
 10. Are samples properly preserved? Yes No
 11. Was preservative added to bottles? Yes No NA
 12. Is there headspace in the VOA vials? Yes No NA
 13. Did all samples containers arrive in good condition(unbroken)? Yes No
 14. Does paperwork match bottle labels? Yes No
 15. Are matrices correctly identified on Chain of Custody? Yes No
 16. Is it clear what analyses were requested? Yes No
 17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	12.8
Sample	13.2

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

