

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural
Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Final Report

Responsible Party

Responsible Party Hilcorp Energy	OGRID 372171
Contact Name Clara Cardoza	Contact Telephone 505.564.0733
Contact email ccardoza@hilcorp.com	Incident # (assigned by OCD) nCS1703326324
Contact mailing address 382 CR 3100, Aztec NM 87410	

Location of Release Source

Latitude 36.672531 Longitude -108.03214
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Lucerne 1 (P&A Well)	Site Type Gas Well
Date Release Discovered 1/27/2017	API# (if applicable) 30-045-07579

Unit Letter	Section	Township	Range	County
M	08	28N	11W	San Juan

Surface Owner: ☐ State ☒ Federal ☐ Tribal ☐ Private (Name: _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Condensate	Volume Released (bbls) Unknown	Volume Recovered (bbls) 0
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release:

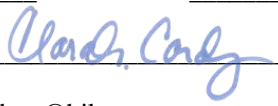
During facility stripping of the P&A well Lucerne 1 on January 27th a large area of contamination was discovered. Early assessment also indicates that north and northwest area contamination may be off location. Archaeological assessment for 100 ft buffer has been ordered.

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? <input type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? Historic release
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? NMOCD (Vanessa Fields) by Lisa Hunter on Jan 27, 2017 @ 2:21 p.m. by phone BLM (Whitney Thomas) by Lisa Hunter on Jan 27, 2017 @ 2:30 p.m. by phone	

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

<input type="checkbox"/> The source of the release has been stopped. <input type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.	
If all the actions described above have <u>not</u> been undertaken, explain why: This was a historic release and there was no active source at the time of discovery.	
Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.	
Printed Name: <u>Clara Cardoza</u>	Title: <u>Environmental Specialist</u>
Signature: <u></u>	Date: <u>3/5/2019</u>
email: <u>ccardoza@hilcorp.com</u>	Telephone: <u>505.564.0733</u>
<u>OCD Only</u> Received by: _____ Date: _____	

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

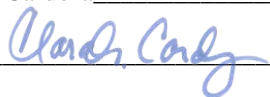
The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: *Each of the following items must be included in the closure report.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Clara Cardoza Title: Environmental Specialist

Signature:  Date: 3/5/2019

email: ccardoza@hilcorp.com Telephone: 505.564.0733

OCD Only

Received by: OCD Via Email Date: 3/5/19

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by:  Date: 3/18/19

Printed Name: Cory Smith Title: Environmental Spec.

Lucerne #1

Release Closure Report

Unit Letter M, Section 8, Township 28 North, Range 11 West
San Juan County, New Mexico
OCD Incident Number: NCS1703326324

February 8, 2019

Prepared for:
Hilcorp Energy Company
382 Road 3100
Aztec, New Mexico 87410

Prepared by:
Rule Engineering, LLC
501 Airport Drive, Suite 205
Farmington, New Mexico 87401


Hilcorp Energy Company Lucerne #1 Release Closure Report

Prepared for:

Hilcorp Energy Company
382 Road 3100
Aztec, New Mexico 87410

Prepared by:

Rule Engineering, LLC
501 Airport Drive, Suite 205
Farmington, New Mexico 87401



Heather M. Woods, P.G., Area Manager

February 8, 2019

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1.0 Introduction

The Hilcorp Energy Company (Hilcorp) Lucerne #1 release site is located in Unit Letter M, Section 8, Township 28 North, Range 11 West, in San Juan County, New Mexico. The historic release was discovered on January 27, 2017, during a facility strip for plugging and abandonment of the well.

A topographic map of the location reproduced from the United States Geological Society quadrangle map of the area is included as Figure 1 and an aerial site map is included as Figure 2.

2.0 Remediation Standards Determination

Remediation of the release began under 19.15.29 New Mexico Authority Code (NMAC) Release Notification (filed 12/1/2008), but continued through the transition to 19.15.29 NMAC Releases (filed 8/14/2018). The remediation standards per 19.15.29 NMAC are determined by depth to groundwater with a concentration of less than 10,000 milligrams per kilogram (mg/kg) total dissolved solids (TDS) and several factors outlined in 19.15.29.12(4)(e) NMAC.

Depth to groundwater at the site is estimated to be between 50 and 100 feet below grade surface (bgs) based on the local well records and the area's geology and geomorphology. However, during a site walk with New Mexico Oil Conservation Division (NMOCD) personnel, a small ephemeral wash about 100 feet to the west of the site was determined to be a tributary to a significant watercourse, therefore assigning the release standards of the *"less than or equal to 50 feet"* category of Table 1, 19.15.29.12 NMAC to the remediation of the impacted soils at the location. These remedial standards are as follows: 600 mg/kg chloride per United States Environmental Protection Agency (USEPA) Method 300.0; 100 mg/kg total petroleum hydrocarbons (TPH) per USEPA Method 8015M; 50 mg/kg total benzene, toluene, ethylbenzene, and xylenes (BTEX) per USEPA Method 8021B or 8260B; and 10 mg/kg benzene per USEPA Method 8021B or 8260B.

3.0 Field Activities

Following assessment activities, excavation of impacted soil and rock began in the northeast portion of the site and continued in a counterclockwise manner around the site through November 20, 2018. Contaminated material was transported to an NMOCD approved landfarm for disposal/remediation. Overburden was continuously monitored for volatile organic compounds (VOCs) with a photo-ionization detector (PID) and for total petroleum hydrocarbons (TPH) using a total hydrocarbon analyzer per U.S. Environmental Protection Agency (USEPA) Method 418.1. Overburden was also sampled for laboratory analysis at approximately 500 cubic yard intervals to confirm benzene, total BTEX, and TPH were below remediation standards.

Following confirmation sampling, the excavation was backfilled with overburden and clean, imported backfill. The disturbed area was then contoured and reseeded according to Bureau of Land Management (BLM) recommendations.

4.0 Confirmation Soil Sampling

Five-point composite samples were collected from all excavation walls and bases. Soil samples collected for laboratory analysis were placed into laboratory supplied glassware, labeled, and maintained on ice until delivery to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico. All samples were analyzed for BTEX per USEPA Method 8260B and TPH per USEPA 8015M/D. Analysis for chlorides was not needed as chloride concentration results during assessment activities were below laboratory detection limits.

A depiction of the excavation extents with sample locations is included as Figure 2. A photograph log of the confirmation sampling areas after August 14, 2018, is included in Appendix A.

5.0 Laboratory Analytical Results

- Laboratory analytical results for the confirmation samples report benzene concentrations ranging below the laboratory reporting limits to 0.053 mg/kg, which are below the remediation standard of 10 mg/kg.
- Laboratory analytical results report total BTEX concentrations ranging from below laboratory reporting limits to 6.4 mg/kg, which are below the remediation standard of 50 mg/kg.
- Laboratory analytical results report TPH concentrations below the remediation standard of 100 mg/kg, ranging from below laboratory reporting limits to 96 mg/kg for all except five samples. TPH concentrations for samples SC-17R (9/27/17), SC-26 (8/21/17), SC-27R (9/27/17), SC-28 (8/21/17), SC-29 (8/21/17), and SC-31 (8/21/17) range from 160 mg/kg to 240 mg/kg. In an email from Cory Smith of the NMOCD dated October 10, 2017, the TPH concentrations of these base samples were approved as alternative closure standards.

Laboratory analytical results are summarized in Table 1, confirmation sample locations are illustrated on Figure 2, and the analytical laboratory reports are included in Appendix B.

6.0 Conclusions

Hydrocarbon impacted soils associated with the Lucerne #1 release have been excavated and transported to an approved landfarm for disposal/remediation. Laboratory analytical results for the confirmation samples collected from the excavation report benzene, total BTEX, and TPH concentrations below the remediation standards set forth for the release or at approved alternative closure standards for certain base samples. Therefore, no further work is recommended.

7.0 Closure and Limitations

This report has been prepared for the exclusive use of Hilcorp and is subject to the terms, conditions, and limitations stated in Rule's report and Service Agreement with Hilcorp. All work has been performed in accordance with generally accepted professional environmental consulting practices. No other warranty is expressed or implied.

Clara Cardoza

From: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Sent: Tuesday, October 10, 2017 1:06 PM
To: Clara Cardoza; Fields, Vanessa, EMNRD; 'whitney thomas (l1thomas@blm.gov)'
Subject: Re: Lucerne 1

Good Afternoon Clara,

i am out of the office and i must have forgot to send a response prior to leaving.

I believe HilCorp has already received approval for alternative closure standards for the majority of the base minus SC-17 and SC-27. Based upon the resampling results after further excavation it appears that the contaminates are reducing quickly and the remaining contaminates do not pose a threat to the environment Hilcorp can proceed to back fill in those areas. Side wall samples that are over the limits will need to be further remediation or additional delineation as we discussed.

Thanks

From: Clara Cardoza
Sent: Monday, October 9, 2017 8:17 AM
To: Smith, Cory, EMNRD; Fields, Vanessa, EMNRD; 'whitney thomas (l1thomas@blm.gov)'
Subject: RE: Lucerne 1

Good morning. Just wanted to check in with you to see if there has been a decision made for the Lucerne 1 on the request I made below.

Thank you,
Clara

From: Clara Cardoza
Sent: Thursday, September 28, 2017 4:31 PM
To: cory.smith@state.nm.us; Fields, Vanessa, EMNRD ; whitney thomas (l1thomas@blm.gov)
Subject: Lucerne 1

Below is a table with lab results for the base of the excavation at the Lucerne 1. This site has been ranked a 20 based on distance to the nearest blue line (drainage). Although some of the TPH levels are above the 100ppm, BTEX is either ND or below the action level, the base is terminated at a hard sandstone, and ground water is not at a shallow depth, nor at risk. Due to BTEX levels below the action level, Hilcorp Energy believes the residual contaminates do not pose a present or foreseeable threat or an environmental risk to water, humans or animals, and requests approval to backfill the excavation in order to continue work (delineation) on the south and west portion of the excavation. Attached are preliminary results from yesterday's confirmation samples for SC-17R and SC-27R. Also for your convenience, attached is the site diagram with additional lab results.

Sample Name	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylebenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH as GRO (mg/kg)	TPH as DRO (mg/kg)	TPH as MRO (mg/kg)
NMOCD Action Level		10	NE	NE	NE	50	100		
SC-13	8/21/2017	<0.023	<0.046	<0.046	<0.091	ND	8.4	64	<50
SC-17	8/21/2017	<0.12	<0.23	0.65	6.6	7.25	190	560	120
SC-17R	9/27/2017	<0.096	0.68	0.51	5.2	6.39	84	99	<47
SC-25	8/21/2017	<0.025	<0.050	<0.050	<0.099	ND	<5.0	11	<48

SC-26	8/21/2017	<0.024	<0.048	<0.048	<0.097	ND	4.8	150	55
SC-27	8/21/2017	0.60	<0.25	3.9	37	41.50	530	510	<49
SC-27R	9/27/2017	<0.10	<0.22	0.22	1.9	2.12	30	66	<51
SC-28	8/21/2017	<0.047	<0.094	<0.094	<0.19	ND	<9.4	150	56
SC-29	8/21/2017	<0.024	<0.047	<0.047	0.28	0.28	<4.7	160	<48
SC-30	8/21/2017	<0.023	<0.046	<0.046	<0.091	ND	<4.6	12	<46
SC-31	8/21/2017	<0.047	<0.094	<0.094	0.29	0.29	12	180	48

Thank you for your consideration.

Clara M Cardoza

Environmental Specialist

505-564-0733 (O)

505-793-2784 (C)



Please consider the environment before printing this e-mail



RE: Hilcorp Energy Lucerne #1 API 30-045-07579

Please let this serve as notice that after the remediation at the Lucerne #1 HEC has completed revegetation and this area is no longer needed for oil and gas exploration.

382 CR 3100 Aztec NM 87410
Phone: 505.599.3400

PO Box 61229, Houston, TX 77208-1229 1111 Travis Street, Houston, TX 77002
Phone: 713/209-2400 Fax 713/209-2478 hilcorp.com

Table

Table 1. Summary of Confirmation Sample Laboratory Analytical Results
Hilcorp Energy Company
Lucerne #1
San Juan County, New Mexico

Sample Name	Date	Laboratory Report Number	Sample Location	Laboratory Analytical Results							
				Benzene (mg/kg)	Toluene (mg/kg)	Ethylben- zene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH as GRO (mg/kg)	TPH as DRO (mg/kg)	TPH as MRO (mg/kg)
NMOCD Closure Criteria*				10	NE	NE	NE	50	100		
SC-13	8/21/2017	1708C15	Base	<0.023	<0.046	<0.046	<0.091	ND	8.4	64	<50
SC-14	8/21/2017	1708C15	Wall	<0.024	<0.048	<0.048	<0.097	ND	<4.8	<9.8	<49
SC-16	8/21/2017	1708C15	Wall	<0.024	<0.048	<0.048	<0.096	ND	<4.8	16	<46
SC-17R	9/27/2017	1709F46	Base	<0.096	0.68	0.51	5.2	6.4	84	99	<47
SC-22	8/21/2017	1708C15	Wall	<0.025	<0.049	<0.049	<0.098	ND	<4.9	35	<47
SC-23	8/21/2017	1708C15	Wall	<0.024	<0.047	<0.047	<0.094	ND	<4.7	27	<48
SC-25	8/21/2017	1708C15	Base	<0.025	<0.050	<0.050	<0.099	ND	<5.0	11	<48
SC-26	8/21/2017	1708C15	Base	<0.024	<0.048	<0.048	<0.097	ND	4.8	150	55
SC-27R	9/27/2017	1709F46	Base	<0.10	<0.20	0.22	1.9	2.1	30	66	<51
SC-28	8/21/2017	1708C15	Base	<0.047	<0.094	<0.094	<0.19	ND	<9.4	150	56
SC-29	8/21/2017	1708C15	Base	<0.024	<0.047	<0.047	0.28	0.28	<4.7	160	<48
SC-30	8/21/2017	1708C15	Base	<0.023	<0.046	<0.046	<0.91	ND	<4.6	12	<46
SC-31	8/21/2017	1708C15	Base	<0.047	<0.094	<0.094	0.29	0.29	12	180	48
SC-35	10/30/2017	1710F60	Wall	<0.020	<0.039	<0.039	<0.079	ND	<3.9	<9.3	<46
SC-36	3/23/2018	1803D47	Wall	<0.023	<0.046	<0.046	<0.093	ND	<4.6	<9.7	<48
SC-37	3/23/2018	1803D47	Wall	<0.024	<0.048	<0.048	<0.096	ND	<4.8	<9.7	<49
SC-38	3/23/2018	1803D47	Wall	<0.023	<0.047	<0.047	<0.093	ND	<4.7	<10	<50
SC-39	3/23/2018	1803D47	Wall	<0.024	<0.047	<0.047	<0.094	ND	<4.7	<9.6	<48
SC-40	3/23/2018	1803D47	Wall	<0.025	<0.049	<0.049	<0.099	ND	<4.9	<9.5	<47
SC-41	3/23/2018	1803D47	Wall	<0.024	<0.048	<0.048	<0.096	ND	<4.8	<9.5	<48
SC-42	3/23/2018	1803D47	Wall	<0.023	<0.047	<0.047	<0.093	ND	<4.7	<10	<50
SC-43	3/23/2018	1803D47	Wall	<0.024	<0.049	<0.049	<0.097	ND	<4.9	<9.6	<48
SC-44	3/23/2018	1803D47	Wall	<0.024	<0.047	<0.047	<0.095	ND	<4.7	<9.7	<48
SC-45	3/23/2018	1803D47	Wall	<0.023	<0.047	<0.047	<0.094	ND	<4.7	<9.9	<50
SC-46	3/23/2018	1803D47	Base	<0.023	<0.046	<0.046	<0.092	ND	<4.6	<10	<50
SC-47	3/23/2018	1803D47	Base	<0.024	<0.048	<0.048	<0.096	ND	<4.8	<9.8	<49
SC-48	3/23/2018	1803D47	Base	<0.024	<0.048	<0.048	<0.096	ND	<4.8	<9.6	<48
SC-1	5/29/2018	1805G33	Base	<0.024	<0.048	<0.048	<0.097	ND	<4.8	<9.2	<46

Table 1. Summary of Confirmation Sample Laboratory Analytical Results
Hilcorp Energy Company
Lucerne #1
San Juan County, New Mexico

Sample Name	Date	Laboratory Report Number	Sample Location	Laboratory Analytical Results							
				Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH as GRO (mg/kg)	TPH as DRO (mg/kg)	TPH as MRO (mg/kg)
NMOCD Closure Criteria*				10	NE	NE	NE	50	100		
SC-2	5/29/2018	1805G33	Base	<0.024	<0.049	<0.049	<0.098	ND	<4.9	16	<46
SC-3	5/29/2018	1805G33	Base	<0.024	0.11	<0.049	0.12	0.23	<4.9	<9.6	<48
SC-4	5/29/2018	1805G33	Base	<0.023	<0.047	<0.047	<0.093	ND	<4.7	35	<46
SC-5	5/29/2018	1805G33	Base	<0.025	<0.049	<0.049	<0.099	ND	<4.9	47	<49
SC-6	5/29/2018	1805G33	Wall	<0.024	<0.049	<0.049	<0.098	ND	<4.9	41	<50
SC-7	5/29/2018	1805G33	Wall	<0.023	<0.046	<0.046	<0.093	ND	<4.6	<10	<50
SC-8	5/29/2018	1805G33	Wall	<0.024	<0.048	<0.048	<0.095	ND	<4.8	<9.9	<49
SC-9	5/29/2018	1805G33	Wall	<0.023	<0.046	<0.046	<0.092	ND	<4.6	<10	<50
SC-10	5/29/2018	1805G33	Wall	<0.023	<0.047	<0.047	<0.094	ND	<4.7	<9.1	<46
SC-11	5/29/2018	1805G33	Wall	<0.023	<0.046	<0.046	<0.092	ND	<4.6	15	<50
SC-12	5/29/2018	1805G33	Base	<0.024	<0.047	<0.047	<0.095	ND	<4.7	18	<46
SC-13	5/29/2018	1805G33	Wall	<0.024	<0.049	<0.049	<0.097	ND	<4.9	23	<49
SC-14	5/29/2018	1805G33	Wall	<0.024	<0.047	<0.047	<0.095	ND	<4.7	<9.6	<48
SC-15	5/29/2018	1805G33	Wall	<0.024	<0.047	<0.047	<0.095	ND	<4.7	<9.8	<49
SC-16	5/29/2018	1805G33	Wall	<0.023	<0.046	<0.046	<0.093	ND	<4.6	<9.8	<49
SC-17	5/29/2018	1805G33	Base	<0.023	<0.046	<0.046	<0.093	ND	<4.6	<9.7	<48
SC-1	7/12/2018	1807695	Wall	<0.024	<0.048	<0.048	<0.096	ND	<4.8	19	<49
SC-2	7/12/2018	1807695	Wall	<0.025	<0.050	<0.050	0.16	0.16	5.2	13	<50
SC-3 (R)	8/10/2018	1808720	Wall	<0.085	<0.17	<0.17	<0.34	ND	<17	<9.5	<47
SC-4	7/12/2018	1807688	Wall	<0.019	<0.038	<0.038	<0.075	ND	<3.8	<10	<50
SC-5	7/12/2018	1807688	Wall	<0.019	<0.038	<0.038	<0.096	ND	<3.8	<10	<50
SC-6	7/12/2018	1807688	Base	<0.017	<0.033	<0.033	<0.066	ND	<3.3	<9.8	<49
SC-7	7/12/2018	1807688	Wall	<0.019	<0.038	<0.038	<0.077	ND	<3.8	<9.9	<50
SC-8	8/1/2018	1808105	Base	<0.020	<0.039	<0.039	<0.079	ND	<3.9	<9.9	<49
SC-9	8/1/2018	1808105	Base	<0.019	<0.037	<0.037	<0.074	ND	<3.7	<9.9	<49
SC-10	7/12/2018	1807695	Base	<0.024	<0.047	<0.047	<0.095	ND	<4.7	<10	<50
SC-11 (R)	8/10/2018	1808720	Base	0.052	0.30	0.079	0.89	1.32	22	20	<49
SC-12	8/1/2018	1808125	Base	<0.025	<0.049	<0.049	<0.098	ND	<4.9	16	<49

Table 1. Summary of Confirmation Sample Laboratory Analytical Results
Hilcorp Energy Company
Lucerne #1
San Juan County, New Mexico

Sample Name	Date	Laboratory Report Number	Sample Location	Laboratory Analytical Results							
				Benzene (mg/kg)	Toluene (mg/kg)	Ethylben- zene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH as GRO (mg/kg)	TPH as DRO (mg/kg)	TPH as MRO (mg/kg)
NMOCD Closure Criteria*				10	NE	NE	NE	50	100		
SC-13	8/1/2018	1808125	Base	<0.024	<0.047	<0.047	<0.095	ND	<4.7	10	<50
SC-17	8/22/2018	1808E15	Wall	<0.019	<0.038	<0.038	<0.075	ND	<3.8	11	<50
SC-18	8/8/2018	1808513	Wall	<0.017	<0.034	0.051	0.25	0.30	<3.4	<9.8	<49
SC-19	8/1/2018	1808105	Wall	<0.018	<0.037	<0.037	<0.074	ND	<3.7	<9.7	<49
SC-20	8/8/2018	1808513	Base	0.021	<0.038	<0.038	<0.075	0.021	<3.8	<10	<50
SC-21	8/1/2018	1808105	Wall	<0.090	<0.18	<0.18	<0.36	ND	<18	<9.9	<50
SC-22	8/1/2018	1808105	Wall	<0.018	<0.037	<0.037	<0.074	ND	<3.7	<9.9	<49
SC-23	8/1/2018	1808105	Base	<0.018	<0.036	<0.036	<0.071	ND	<3.6	<9.9	<49
SC-24	8/8/2018	1808513	Base	<0.090	<0.18	<0.18	<0.36	ND	<18	<9.6	<48
SC-25 (R)	8/10/2018	1808720	Base	0.030	0.14	<0.033	0.11	0.28	<3.3	<9.7	<49
Island	8/10/2018	1808720	Wall	<0.019	<0.037	<0.037	<0.075	ND	<3.7	29	<48
SC-26	8/22/2018	1808E48	Base	0.053	0.18	<0.048	0.35	0.58	<4.8	11	<50
SC-27	8/22/2018	1808E48	Base	<0.025	0.082	<0.050	0.11	0.19	<5.0	<9.7	<49
SC-28	8/22/2018	1808E48	Base	<0.023	<0.046	<0.046	<0.092	ND	<4.6	<9.6	<48
SC-29	8/22/2018	1808E48	Base	<0.024	<0.047	<0.047	<0.095	ND	<4.7	<9.8	<49
SC-30	9/13/2018	1809830	Base	<0.020	<0.040	<0.040	<0.081	ND	<4.0	<10	<50
SC-31	9/13/2018	1809830	Base	0.019	<0.036	<0.036	0.29	0.31	6.0	<10	<50
SC-32	9/13/2018	1809830	Base	0.038	0.15	<0.039	<0.079	0.19	<3.9	<9.8	<49
SC-33	9/13/2018	1809830	Wall	<0.019	<0.039	<0.039	0.078	0.078	<3.9	<9.8	<49
SC-34	9/25/2018	1809F05	Wall	<0.090	<0.18	<0.18	<0.36	ND	<18	<9.4	<47
SC-35	9/25/2018	1809F05	Base	<0.018	<0.037	<0.037	<0.073	ND	<3.7	<9.8	<49
SC-36	9/25/2018	1809F05	Base	<0.019	<0.038	<0.038	<0.075	ND	<3.8	<9.3	<46
SC-37	9/25/2018	1809F05	Wall	<0.019	<0.039	<0.039	<0.079	ND	<3.9	<9.7	<49
SC-38R	9/27/2018	1809G88	Base	<0.10	<0.21	<0.21	0.52	0.52	23	54	<50
SC-39	9/25/2018	1809F05	Base	<0.023	<0.046	<0.046	<0.093	ND	<4.6	<9.9	<49
SC-40	9/25/2018	1809F05	Base	0.026	<0.042	<0.042	0.13	0.16	<4.2	<9.8	<49
SC-41	9/25/2018	1809F05	Wall	<0.020	<0.041	<0.041	<0.081	ND	<4.1	<10	<50
SC-38R	11/8/2018	1811502	Base	<0.092	<0.18	<0.18	<0.37	ND	<18	<9.8	<49

Table 1. Summary of Confirmation Sample Laboratory Analytical Results
Hilcorp Energy Company
Lucerne #1
San Juan County, New Mexico

Sample Name	Date	Laboratory Report Number	Sample Location	Laboratory Analytical Results							
				Benzene (mg/kg)	Toluene (mg/kg)	Ethylben- zene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH as GRO (mg/kg)	TPH as DRO (mg/kg)	TPH as MRO (mg/kg)
NMOCD Closure Criteria*				10	NE	NE	NE	50	100		
SC-39	10/31/2018	1811004	Base	<0.021	<0.042	<0.042	<0.085	ND	<4.2	<9.8	<49
SC-40	10/31/2018	1811004	Base	<0.020	<0.040	<0.040	<0.081	ND	<4.0	<9.8	<49
SC-41	10/31/2018	1811004	Base	<0.098	<0.20	<0.20	<0.39	ND	<20	75	<49
SC-42	10/31/2018	1811004	Base	<0.10	<0.20	<0.20	<0.40	ND	<20	65	<50
SC-43	10/31/2018	1811004	Base	<0.021	<0.042	<0.042	<0.084	ND	<4.2	<9.8	<49
SC-44R	11/8/2018	1811502	Base	<0.088	<0.18	<0.18	<0.35	ND	<18	12	<48
SC-45	10/31/2018	1811004	Base	<0.11	0.25	<0.21	1.7	2.0	29	51	<48
SC-46	10/31/2018	1811004	Base	<0.11	<0.22	<0.22	<0.45	ND	<22	12	<49
SC-47	11/20/2018	1811B21	Base	<0.093	<0.19	<0.19	<0.37	ND	<19	29	<49
SC-48	11/20/2018	1811B21	Base	<0.099	<0.20	<0.20	<0.40	ND	<20	16	<49
SC-49	10/31/2018	1811004	Base	<0.021	<0.043	<0.043	<0.085	ND	<4.3	<9.9	<50
SC-50	10/31/2018	1811004	Wall	<0.020	<0.039	<0.039	<0.078	ND	5.2	19	<47
SC-51	11/20/2018	1811B21	Wall	<0.11	<0.22	<0.22	<0.44	ND	<22	<9.9	<49
SC-52	11/20/2018	1811B21	Base	<0.10	<0.20	<0.20	<0.41	ND	<20	<9.8	<49

Notes: ft bgs - feet below grade surface

mg/kg - milligrams per kilogram

NMOCD - New Mexico Oil Conservation Division

NE - not-established

ND - not detected above laboratory reporting limits

*Per 19.15.29.12 NMAC Table 1 "depth to groundwater less than or equal to 50 ft bgs"

BTEX - benzene, toluene, ethylbenzene, and xylenes

TPH - total petroleum hydrocarbons

GRO - gasoline range organics





DRO - diesel range organics

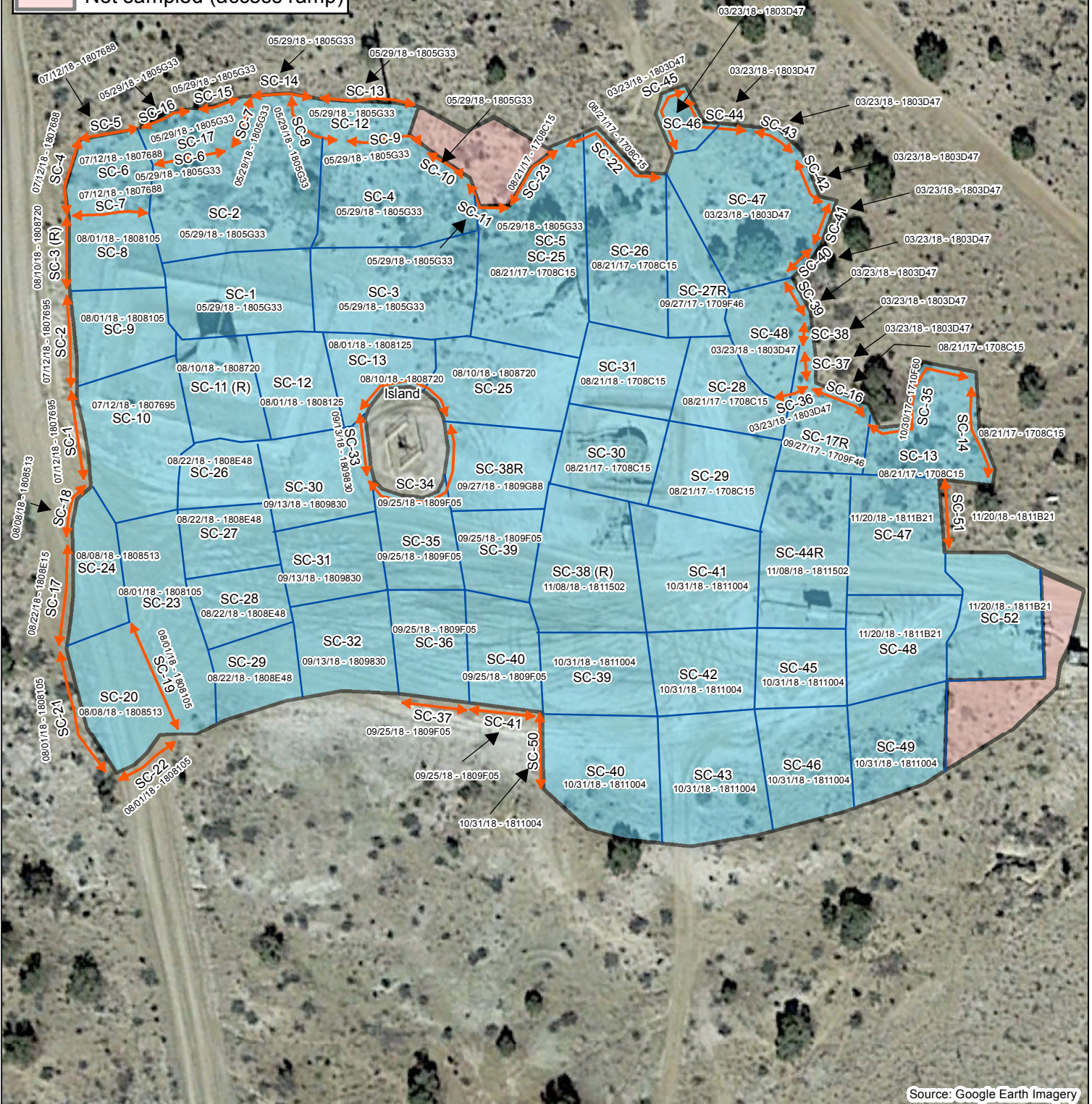
MRO - mineral oil range organics

Figures



Legend

-  Excavation wall sample
-  Sample cell
-  Area of excavation
-  Not sampled (access ramp)



Rule Engineering, LLC
Solutions to Regulations for Industry

0 20 40 80 120 Feet
1 inch = 60 feet





M-S8-T28N-R11W
N36.67253, W108.03214
San Juan County, NM
API: 30-045-07579


Figure 2
Aerial Site Map
Lucerne #1


Appendix A


Photograph Log


Photograph #1	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: August 28, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-26 (8/22/2018), SC-27 (8/22/2018), SC-28 (8/22/2018), and SC-29 (8/22/2018).	


Photograph #2	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: August 27, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-30 (9/13/2018), SC-31 (9/13/2018), SC-32 (9/13/2018), and SC-33 (9/13/2018).	


Photograph #3	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: September 26, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-34 (9/25/2018), SC-35 (9/25/2018), SC-36 (9/25/2018), SC-37 (9/25/2018), SC-38 (9/25/2018), SC-39 (9/25/2018), and SC-40 (9/25/2018), and SC-41 (9/25/2018).	


Photograph #4	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: September 27, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-34 (9/25/2018), SC-35 (9/25/2018), SC-36 (9/25/2018), SC-37 (9/25/2018), SC-38 (9/25/2018), SC-39 (9/25/2018), and SC-40 (9/25/2018), and SC-41 (9/25/2018).	

Photograph #5	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: September 26, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-34 (9/25/2018), SC-35 (9/25/2018), SC-36 (9/25/2018), SC-37 (9/25/2018), SC-38 (9/25/2018), SC-39 (9/25/2018), and SC-40 (9/25/2018), and SC-41 (9/25/2018).	

Photograph #6	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: September 28, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample area SC-38R (9/27/2018).	

Photograph #7	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: November 1, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-38 (10/31/2018), SC-39 (10/31/2018), SC-40 (10/31/2018), SC-41 (10/31/2018), SC-42 (10/31/2018), SC-43 (10/31/2018), and SC-50 (10/31/2018).	

Photograph #8	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: November 1, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-41 (10/31/2018), SC-42 (10/31/2018), SC-43 (10/31/2018), SC-44 (10/31/2018), SC-45 (10/31/2018), SC-46 (10/31/2018), SC-47 (10/31/2018), SC-48 (10/31/2018), SC-49 (10/31/2018), and SC-51 (10/31/2018).	

Photograph #9	
Client: Hilcorp	
Site Name: Lucerne #1	
Date Photo Taken: November 16, 2018	
Release Location: M-8-28N-11W San Juan County, NM	
Description: View of final excavation in sample areas SC-47 (11/20/2018), SC-48 (11/20/2018), SC-49 (11/20/2018), SC-51 (11/20/2018), and SC-52 (11/20/2018).	

Appendix B

Analytical Laboratory Reports



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 25, 2017

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Hilcorp Lucerne #1

OrderNo.: 1708C15

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 19 sample(s) on 8/22/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-13

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 9:51:00 AM

Lab ID: 1708C15-001

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	64	10		mg/Kg	1	8/23/2017 10:17:14 AM	33491
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/23/2017 10:17:14 AM	33491
Surr: DNOP	106	70-130		%Rec	1	8/23/2017 10:17:14 AM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	8.4	4.6		mg/Kg	1	8/23/2017 12:47:26 PM	33486
Surr: BFB	176	54-150	S	%Rec	1	8/23/2017 12:47:26 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/23/2017 12:47:26 PM	33486
Toluene	ND	0.046		mg/Kg	1	8/23/2017 12:47:26 PM	33486
Ethylbenzene	ND	0.046		mg/Kg	1	8/23/2017 12:47:26 PM	33486
Xylenes, Total	ND	0.091		mg/Kg	1	8/23/2017 12:47:26 PM	33486
Surr: 4-Bromofluorobenzene	115	66.6-132		%Rec	1	8/23/2017 12:47:26 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-14

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 9:55:00 AM

Lab ID: 1708C15-002

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/23/2017 11:31:46 AM	33491
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/23/2017 11:31:46 AM	33491
Surr: DNOP	105	70-130		%Rec	1	8/23/2017 11:31:46 AM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/23/2017 1:59:34 PM	33486
Surr: BFB	88.6	54-150		%Rec	1	8/23/2017 1:59:34 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2017 1:59:34 PM	33486
Toluene	ND	0.048		mg/Kg	1	8/23/2017 1:59:34 PM	33486
Ethylbenzene	ND	0.048		mg/Kg	1	8/23/2017 1:59:34 PM	33486
Xylenes, Total	ND	0.097		mg/Kg	1	8/23/2017 1:59:34 PM	33486
Surr: 4-Bromofluorobenzene	114	66.6-132		%Rec	1	8/23/2017 1:59:34 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-15

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:01:00 AM

Lab ID: 1708C15-003

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	230	9.9		mg/Kg	1	8/23/2017 11:56:46 AM	33491
Motor Oil Range Organics (MRO)	51	49		mg/Kg	1	8/23/2017 11:56:46 AM	33491
Surr: DNOP	107	70-130		%Rec	1	8/23/2017 11:56:46 AM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	43	9.9		mg/Kg	2	8/23/2017 3:11:51 PM	33486
Surr: BFB	254	54-150	S	%Rec	2	8/23/2017 3:11:51 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.049		mg/Kg	2	8/23/2017 3:11:51 PM	33486
Toluene	ND	0.099		mg/Kg	2	8/23/2017 3:11:51 PM	33486
Ethylbenzene	0.10	0.099		mg/Kg	2	8/23/2017 3:11:51 PM	33486
Xylenes, Total	0.79	0.20		mg/Kg	2	8/23/2017 3:11:51 PM	33486
Surr: 4-Bromofluorobenzene	126	66.6-132		%Rec	2	8/23/2017 3:11:51 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-16

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:10:00 AM

Lab ID: 1708C15-004

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	16	9.2		mg/Kg	1	8/23/2017 12:21:39 PM	33491
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/23/2017 12:21:39 PM	33491
Surr: DNOP	107	70-130		%Rec	1	8/23/2017 12:21:39 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/23/2017 3:35:59 PM	33486
Surr: BFB	88.5	54-150		%Rec	1	8/23/2017 3:35:59 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2017 3:35:59 PM	33486
Toluene	ND	0.048		mg/Kg	1	8/23/2017 3:35:59 PM	33486
Ethylbenzene	ND	0.048		mg/Kg	1	8/23/2017 3:35:59 PM	33486
Xylenes, Total	ND	0.096		mg/Kg	1	8/23/2017 3:35:59 PM	33486
Surr: 4-Bromofluorobenzene	111	66.6-132		%Rec	1	8/23/2017 3:35:59 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-17

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:14:00 AM

Lab ID: 1708C15-005

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	560	9.7		mg/Kg	1	8/23/2017 12:46:42 PM	33491
Motor Oil Range Organics (MRO)	120	48		mg/Kg	1	8/23/2017 12:46:42 PM	33491
Surr: DNOP	109	70-130		%Rec	1	8/23/2017 12:46:42 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	190	23		mg/Kg	5	8/23/2017 4:00:04 PM	33486
Surr: BFB	297	54-150	S	%Rec	5	8/23/2017 4:00:04 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.12		mg/Kg	5	8/23/2017 4:00:04 PM	33486
Toluene	ND	0.23		mg/Kg	5	8/23/2017 4:00:04 PM	33486
Ethylbenzene	0.65	0.23		mg/Kg	5	8/23/2017 4:00:04 PM	33486
Xylenes, Total	6.6	0.46		mg/Kg	5	8/23/2017 4:00:04 PM	33486
Surr: 4-Bromofluorobenzene	128	66.6-132		%Rec	5	8/23/2017 4:00:04 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-18

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:20:00 AM

Lab ID: 1708C15-006

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	300	9.7		mg/Kg	1	8/23/2017 1:11:39 PM	33491
Motor Oil Range Organics (MRO)	100	48		mg/Kg	1	8/23/2017 1:11:39 PM	33491
Surr: DNOP	104	70-130		%Rec	1	8/23/2017 1:11:39 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	19	9.5		mg/Kg	2	8/23/2017 4:24:09 PM	33486
Surr: BFB	196	54-150	S	%Rec	2	8/23/2017 4:24:09 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.047		mg/Kg	2	8/23/2017 4:24:09 PM	33486
Toluene	ND	0.095		mg/Kg	2	8/23/2017 4:24:09 PM	33486
Ethylbenzene	ND	0.095		mg/Kg	2	8/23/2017 4:24:09 PM	33486
Xylenes, Total	ND	0.19		mg/Kg	2	8/23/2017 4:24:09 PM	33486
Surr: 4-Bromofluorobenzene	120	66.6-132		%Rec	2	8/23/2017 4:24:09 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-19

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:27:00 AM

Lab ID: 1708C15-007

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	240	9.5		mg/Kg	1	8/23/2017 1:36:46 PM	33491
Motor Oil Range Organics (MRO)	79	47		mg/Kg	1	8/23/2017 1:36:46 PM	33491
Surr: DNOP	101	70-130		%Rec	1	8/23/2017 1:36:46 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	7.9	4.7		mg/Kg	1	8/23/2017 4:48:10 PM	33486
Surr: BFB	186	54-150	S	%Rec	1	8/23/2017 4:48:10 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2017 4:48:10 PM	33486
Toluene	ND	0.047		mg/Kg	1	8/23/2017 4:48:10 PM	33486
Ethylbenzene	ND	0.047		mg/Kg	1	8/23/2017 4:48:10 PM	33486
Xylenes, Total	0.10	0.094		mg/Kg	1	8/23/2017 4:48:10 PM	33486
Surr: 4-Bromofluorobenzene	117	66.6-132		%Rec	1	8/23/2017 4:48:10 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-20

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:34:00 AM

Lab ID: 1708C15-008

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	370	10		mg/Kg	1	8/23/2017 2:01:44 PM	33491
Motor Oil Range Organics (MRO)	170	50		mg/Kg	1	8/23/2017 2:01:44 PM	33491
Surr: DNOP	104	70-130		%Rec	1	8/23/2017 2:01:44 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	11	9.6		mg/Kg	2	8/23/2017 5:12:09 PM	33486
Surr: BFB	179	54-150	S	%Rec	2	8/23/2017 5:12:09 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.048		mg/Kg	2	8/23/2017 5:12:09 PM	33486
Toluene	ND	0.096		mg/Kg	2	8/23/2017 5:12:09 PM	33486
Ethylbenzene	ND	0.096		mg/Kg	2	8/23/2017 5:12:09 PM	33486
Xylenes, Total	0.21	0.19		mg/Kg	2	8/23/2017 5:12:09 PM	33486
Surr: 4-Bromofluorobenzene	119	66.6-132		%Rec	2	8/23/2017 5:12:09 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-21

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:42:00 AM

Lab ID: 1708C15-009

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/23/2017 2:26:58 PM	33491
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2017 2:26:58 PM	33491
Surr: DNOP	100	70-130		%Rec	1	8/23/2017 2:26:58 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/23/2017 7:59:30 PM	33486
Surr: BFB	87.3	54-150		%Rec	1	8/23/2017 7:59:30 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/23/2017 7:59:30 PM	33486
Toluene	ND	0.046		mg/Kg	1	8/23/2017 7:59:30 PM	33486
Ethylbenzene	ND	0.046		mg/Kg	1	8/23/2017 7:59:30 PM	33486
Xylenes, Total	ND	0.092		mg/Kg	1	8/23/2017 7:59:30 PM	33486
Surr: 4-Bromofluorobenzene	110	66.6-132		%Rec	1	8/23/2017 7:59:30 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-22

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:54:00 AM

Lab ID: 1708C15-010

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	35	9.4		mg/Kg	1	8/23/2017 2:52:05 PM	33491
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/23/2017 2:52:05 PM	33491
Surr: DNOP	96.0	70-130		%Rec	1	8/23/2017 2:52:05 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/23/2017 8:23:22 PM	33486
Surr: BFB	86.2	54-150		%Rec	1	8/23/2017 8:23:22 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/23/2017 8:23:22 PM	33486
Toluene	ND	0.049		mg/Kg	1	8/23/2017 8:23:22 PM	33486
Ethylbenzene	ND	0.049		mg/Kg	1	8/23/2017 8:23:22 PM	33486
Xylenes, Total	ND	0.098		mg/Kg	1	8/23/2017 8:23:22 PM	33486
Surr: 4-Bromofluorobenzene	111	66.6-132		%Rec	1	8/23/2017 8:23:22 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-23

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 10:59:00 AM

Lab ID: 1708C15-011

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	27	9.5		mg/Kg	1	8/23/2017 3:17:13 PM	33491
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2017 3:17:13 PM	33491
Surr: DNOP	90.3	70-130		%Rec	1	8/23/2017 3:17:13 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/23/2017 8:47:09 PM	33486
Surr: BFB	92.3	54-150		%Rec	1	8/23/2017 8:47:09 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2017 8:47:09 PM	33486
Toluene	ND	0.047		mg/Kg	1	8/23/2017 8:47:09 PM	33486
Ethylbenzene	ND	0.047		mg/Kg	1	8/23/2017 8:47:09 PM	33486
Xylenes, Total	ND	0.094		mg/Kg	1	8/23/2017 8:47:09 PM	33486
Surr: 4-Bromofluorobenzene	115	66.6-132		%Rec	1	8/23/2017 8:47:09 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-24

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 11:05:00 AM

Lab ID: 1708C15-012

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	140	9.6		mg/Kg	1	8/23/2017 3:42:13 PM	33491
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2017 3:42:13 PM	33491
Surr: DNOP	106	70-130		%Rec	1	8/23/2017 3:42:13 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	31	24		mg/Kg	5	8/23/2017 9:10:59 PM	33486
Surr: BFB	179	54-150	S	%Rec	5	8/23/2017 9:10:59 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.12		mg/Kg	5	8/23/2017 9:10:59 PM	33486
Toluene	ND	0.24		mg/Kg	5	8/23/2017 9:10:59 PM	33486
Ethylbenzene	ND	0.24		mg/Kg	5	8/23/2017 9:10:59 PM	33486
Xylenes, Total	ND	0.47		mg/Kg	5	8/23/2017 9:10:59 PM	33486
Surr: 4-Bromofluorobenzene	119	66.6-132		%Rec	5	8/23/2017 9:10:59 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-25

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 11:22:00 AM

Lab ID: 1708C15-013

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	11	9.6		mg/Kg	1	8/23/2017 4:07:23 PM	33491
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2017 4:07:23 PM	33491
Surr: DNOP	98.5	70-130		%Rec	1	8/23/2017 4:07:23 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/23/2017 9:34:51 PM	33486
Surr: BFB	85.8	54-150		%Rec	1	8/23/2017 9:34:51 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/23/2017 9:34:51 PM	33486
Toluene	ND	0.050		mg/Kg	1	8/23/2017 9:34:51 PM	33486
Ethylbenzene	ND	0.050		mg/Kg	1	8/23/2017 9:34:51 PM	33486
Xylenes, Total	ND	0.099		mg/Kg	1	8/23/2017 9:34:51 PM	33486
Surr: 4-Bromofluorobenzene	109	66.6-132		%Rec	1	8/23/2017 9:34:51 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-26

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 11:26:00 AM

Lab ID: 1708C15-014

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	150	9.3		mg/Kg	1	8/23/2017 4:32:19 PM	33491
Motor Oil Range Organics (MRO)	55	46		mg/Kg	1	8/23/2017 4:32:19 PM	33491
Surr: DNOP	99.1	70-130		%Rec	1	8/23/2017 4:32:19 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	4.8	4.8		mg/Kg	1	8/23/2017 9:58:42 PM	33486
Surr: BFB	132	54-150		%Rec	1	8/23/2017 9:58:42 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2017 9:58:42 PM	33486
Toluene	ND	0.048		mg/Kg	1	8/23/2017 9:58:42 PM	33486
Ethylbenzene	ND	0.048		mg/Kg	1	8/23/2017 9:58:42 PM	33486
Xylenes, Total	ND	0.097		mg/Kg	1	8/23/2017 9:58:42 PM	33486
Surr: 4-Bromofluorobenzene	116	66.6-132		%Rec	1	8/23/2017 9:58:42 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-27

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 11:32:00 AM

Lab ID: 1708C15-015

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	510	9.9		mg/Kg	1	8/23/2017 4:57:20 PM	33491
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/23/2017 4:57:20 PM	33491
Surr: DNOP	104	70-130		%Rec	1	8/23/2017 4:57:20 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	530	25		mg/Kg	5	8/23/2017 10:22:38 PM	33486
Surr: BFB	585	54-150	S	%Rec	5	8/23/2017 10:22:38 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.60	0.12		mg/Kg	5	8/23/2017 10:22:38 PM	33486
Toluene	ND	0.25		mg/Kg	5	8/23/2017 10:22:38 PM	33486
Ethylbenzene	3.9	0.25		mg/Kg	5	8/23/2017 10:22:38 PM	33486
Xylenes, Total	37	0.50		mg/Kg	5	8/23/2017 10:22:38 PM	33486
Surr: 4-Bromofluorobenzene	143	66.6-132	S	%Rec	5	8/23/2017 10:22:38 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-28

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 11:43:00 AM

Lab ID: 1708C15-016

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	150	9.5		mg/Kg	1	8/23/2017 5:22:07 PM	33491
Motor Oil Range Organics (MRO)	56	47		mg/Kg	1	8/23/2017 5:22:07 PM	33491
Surr: DNOP	106	70-130		%Rec	1	8/23/2017 5:22:07 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	9.4	D	mg/Kg	2	8/23/2017 10:46:34 PM	33486
Surr: BFB	153	54-150	SD	%Rec	2	8/23/2017 10:46:34 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.047	D	mg/Kg	2	8/23/2017 10:46:34 PM	33486
Toluene	ND	0.094	D	mg/Kg	2	8/23/2017 10:46:34 PM	33486
Ethylbenzene	ND	0.094	D	mg/Kg	2	8/23/2017 10:46:34 PM	33486
Xylenes, Total	ND	0.19	D	mg/Kg	2	8/23/2017 10:46:34 PM	33486
Surr: 4-Bromofluorobenzene	117	66.6-132	D	%Rec	2	8/23/2017 10:46:34 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-29

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 11:54:00 AM

Lab ID: 1708C15-017

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	160	9.6		mg/Kg	1	8/23/2017 5:47:11 PM	33491
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/23/2017 5:47:11 PM	33491
Surr: DNOP	98.6	70-130		%Rec	1	8/23/2017 5:47:11 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/23/2017 11:10:31 PM	33486
Surr: BFB	120	54-150		%Rec	1	8/23/2017 11:10:31 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/23/2017 11:10:31 PM	33486
Toluene	ND	0.047		mg/Kg	1	8/23/2017 11:10:31 PM	33486
Ethylbenzene	ND	0.047		mg/Kg	1	8/23/2017 11:10:31 PM	33486
Xylenes, Total	0.28	0.095		mg/Kg	1	8/23/2017 11:10:31 PM	33486
Surr: 4-Bromofluorobenzene	117	66.6-132		%Rec	1	8/23/2017 11:10:31 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-30

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 11:55:00 AM

Lab ID: 1708C15-018

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	12	9.1		mg/Kg	1	8/23/2017 6:12:23 PM	33491
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/23/2017 6:12:23 PM	33491
Surr: DNOP	102	70-130		%Rec	1	8/23/2017 6:12:23 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/23/2017 11:34:25 PM	33486
Surr: BFB	90.3	54-150		%Rec	1	8/23/2017 11:34:25 PM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/23/2017 11:34:25 PM	33486
Toluene	ND	0.046		mg/Kg	1	8/23/2017 11:34:25 PM	33486
Ethylbenzene	ND	0.046		mg/Kg	1	8/23/2017 11:34:25 PM	33486
Xylenes, Total	ND	0.091		mg/Kg	1	8/23/2017 11:34:25 PM	33486
Surr: 4-Bromofluorobenzene	116	66.6-132		%Rec	1	8/23/2017 11:34:25 PM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1708C15

Date Reported: 8/25/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-31

Project: Hilcorp Lucerne #1

Collection Date: 8/21/2017 12:01:00 PM

Lab ID: 1708C15-019

Matrix: SOIL

Received Date: 8/22/2017 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	180	9.6		mg/Kg	1	8/23/2017 6:37:30 PM	33491
Motor Oil Range Organics (MRO)	48	48		mg/Kg	1	8/23/2017 6:37:30 PM	33491
Surr: DNOP	102	70-130		%Rec	1	8/23/2017 6:37:30 PM	33491
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	12	9.4		mg/Kg	2	8/24/2017 1:10:15 AM	33486
Surr: BFB	157	54-150	S	%Rec	2	8/24/2017 1:10:15 AM	33486
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.047		mg/Kg	2	8/24/2017 1:10:15 AM	33486
Toluene	ND	0.094		mg/Kg	2	8/24/2017 1:10:15 AM	33486
Ethylbenzene	ND	0.094		mg/Kg	2	8/24/2017 1:10:15 AM	33486
Xylenes, Total	0.29	0.19		mg/Kg	2	8/24/2017 1:10:15 AM	33486
Surr: 4-Bromofluorobenzene	124	66.6-132		%Rec	2	8/24/2017 1:10:15 AM	33486

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1708C15

25-Aug-17

Client: Rule Engineering LLC

Project: Hilcorp Lucerne #1

Sample ID	LCS-33491		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 33491		RunNo: 45144					
Prep Date:	8/22/2017		Analysis Date: 8/23/2017		SeqNo: 1429399		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	93.7	73.2	114			
Surr: DNOP	5.1		5.000		102	70	130			

Sample ID	MB-33491	SampType: MBLK			TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS	Batch ID: 33491			RunNo: 45144					
Prep Date:	8/22/2017	Analysis Date: 8/23/2017			SeqNo: 1429400		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		100	70	130			

Sample ID	1708C15-001AMS		SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-13		Batch ID: 33491		RunNo: 45144					
Prep Date:	8/22/2017		Analysis Date: 8/23/2017		SeqNo: 1429795		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	120	9.9	49.55	63.51	110	55.8	122			
Surr: DNOP	5.3		4.955		108	70	130			

Sample ID	1708C15-001AMSD		SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID:	SC-13		Batch ID: 33491		RunNo: 45144						
Prep Date:	8/22/2017		Analysis Date: 8/23/2017		SeqNo: 1429796		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	120	9.5	47.71	63.51	128	55.8	122	5.18	20	S	
Surr: DNOP	5.1		4.771		107	70	130	0	0		

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1708C15

25-Aug-17

Client: Rule Engineering LLC

Project: Hilcorp Lucerne #1

Sample ID	MB-33486		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBS		Batch ID: 33486		RunNo: 45160					
Prep Date:	8/22/2017		Analysis Date: 8/23/2017		SeqNo: 1430151		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	850		1000		84.7	54	150			

Sample ID	LCS-33486		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 33486		RunNo: 45160					
Prep Date:	8/22/2017		Analysis Date: 8/23/2017		SeqNo: 1430152		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.6	76.4	125			
Surr: BFB	900		1000		89.7	54	150			

Sample ID	1708C15-002AMS		SampType: MS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	SC-14		Batch ID: 33486		RunNo: 45160					
Prep Date:	8/22/2017		Analysis Date: 8/23/2017		SeqNo: 1430155		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	30	4.7	23.61	0	125	77.8	128			
Surr: BFB	960		944.3		102	54	150			

Sample ID	1708C15-002AMSD		SampType:	MSD		TestCode:	EPA Method 8015D: Gasoline Range				
Client ID:	SC-14		Batch ID:	33486		RunNo:	45160				
Prep Date:	8/22/2017		Analysis Date:	8/23/2017		SeqNo:	1430156		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	30	4.9	24.51	0	122	77.8	128	0.972	20		
Surr: BFB	1000		980.4		102	54	150	0	0		

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1708C15

25-Aug-17

Client: Rule Engineering LLC

Project: Hilcorp Lucerne #1

Sample ID	MB-33486		SampType:	MBLK		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	PBS		Batch ID:	33486		RunNo:	45160			
Prep Date:	8/22/2017		Analysis Date:	8/23/2017		SeqNo:	1430182	Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		110	66.6	132			

Sample ID	LCS-33486		SampType:	LCS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	LCSS		Batch ID:	33486		RunNo:	45160			
Prep Date:	8/22/2017		Analysis Date:	8/23/2017		SeqNo:	1430183	Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	109	80	120			
Toluene	1.1	0.050	1.000	0	109	80	120			
Ethylbenzene	1.1	0.050	1.000	0	107	80	120			
Xylenes, Total	3.3	0.10	3.000	0	110	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		118	66.6	132			

Sample ID	1708C15-001AMS		SampType:	MS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-13		Batch ID:	33486		RunNo:	45160			
Prep Date:	8/22/2017		Analysis Date:	8/23/2017		SeqNo:	1430185	Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.2	0.024	0.9425	0.009698	129	80.9	132			
Toluene	1.2	0.047	0.9425	0.01372	130	79.8	136			
Ethylbenzene	1.3	0.047	0.9425	0.03065	130	79.4	140			
Xylenes, Total	3.8	0.094	2.828	0.06386	132	78.5	142			
Surr: 4-Bromofluorobenzene	1.2		0.9425		122	66.6	132			

Sample ID	1708C15-001AMSD		SampType:	MSD		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-13		Batch ID:	33486		RunNo:	45160			
Prep Date:	8/22/2017		Analysis Date:	8/23/2017		SeqNo:	1430186	Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.2	0.024	0.9506	0.009698	128	80.9	132	0.244	20	
Toluene	1.2	0.048	0.9506	0.01372	129	79.8	136	0.147	20	
Ethylbenzene	1.2	0.048	0.9506	0.03065	127	79.4	140	0.947	20	
Xylenes, Total	3.8	0.095	2.852	0.06386	131	78.5	142	0.402	20	
Surr: 4-Bromofluorobenzene	1.1		0.9506		120	66.6	132	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: **RULE ENGINEERING LL**

Work Order Number: **1708C15**

RcptNo: **1**

Received By: **Anne Thorne** 8/22/2017 7:00:00 AM

Anne Thorne

Completed By: **Anne Thorne** 8/22/2017 8:42:34 AM

Anne Thorne

Reviewed By: **ENM** 8/22/17

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Courier

Log In

4. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
5. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☒ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
9. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
11. Were any sample containers received broken? Yes ☐ No ☒
12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
13. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
14. Is it clear what analyses were requested? Yes ☒ No ☐
15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: Full Engineering, LLC

Mailing Address: 501 Airport Dr, Ste 205

Farmington, NM 87401

Phone #: (505) 716-2787

email or Fax#: hwwoods@fullengineering.com

QA/QC Package:

☒ Standard

☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:

☐ Standard

☒ Rush 3-Day

Project Name:

Hillcorp Lucerne #1

Project #:

Project Manager:

Heather Woods

Sampler: Heather Woods / Justin Valdez

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0

Container Type and #

Preservative Type

HEAL No.

1708C15

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Received by:

Chris A. Wark

8/21/17

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Relinquished by:

Heather M. Woods

8/21/17

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Date:

8/21/17

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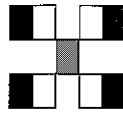
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**HALL ENVIRONMENTAL
ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TPH (Gas only)	BTEX + MTBE + TPH (Gas only)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks: Page 1 of 2



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 29, 2017

Clara Cardoza
Hilcorp Energy
PO Box 4700
Farmington, NM 87499
TEL: (505) 324-4128
FAX

RE: Lucerne 1

OrderNo.: 1709F46

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/28/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1709F46

Date Reported: 9/29/2017

CLIENT: Hilcorp Energy

Client Sample ID: SC-27R

Project: Lucerne 1

Collection Date: 9/27/2017 7:55:00 AM

Lab ID: 1709F46-001

Matrix: MEOH (SOIL)

Received Date: 9/28/2017 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	66	10		mg/Kg	1	9/28/2017 11:38:42 AM	34120
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	9/28/2017 11:38:42 AM	34120
Surr: DNOP	103	70-130		%Rec	1	9/28/2017 11:38:42 AM	34120
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	30	20		mg/Kg	5	9/28/2017 11:16:11 AM	34110
Surr: BFB	129	54-150		%Rec	5	9/28/2017 11:16:11 AM	34110
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.10		mg/Kg	5	9/28/2017 11:16:11 AM	34110
Toluene	ND	0.20		mg/Kg	5	9/28/2017 11:16:11 AM	34110
Ethylbenzene	0.22	0.20		mg/Kg	5	9/28/2017 11:16:11 AM	34110
Xylenes, Total	1.9	0.40		mg/Kg	5	9/28/2017 11:16:11 AM	34110
Surr: 4-Bromofluorobenzene	108	66.6-132		%Rec	5	9/28/2017 11:16:11 AM	34110

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1709F46

Date Reported: 9/29/2017

CLIENT: Hilcorp Energy

Client Sample ID: SC-17R

Project: Lucerne 1

Collection Date: 9/27/2017 8:04:00 AM

Lab ID: 1709F46-002

Matrix: MEOH (SOIL)

Received Date: 9/28/2017 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	99	9.5		mg/Kg	1	9/28/2017 12:00:45 PM	34120
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/28/2017 12:00:45 PM	34120
Surr: DNOP	102	70-130		%Rec	1	9/28/2017 12:00:45 PM	34120
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	84	19		mg/Kg	5	9/28/2017 11:39:35 AM	34110
Surr: BFB	186	54-150	S	%Rec	5	9/28/2017 11:39:35 AM	34110
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.096		mg/Kg	5	9/28/2017 11:39:35 AM	34110
Toluene	0.68	0.19		mg/Kg	5	9/28/2017 11:39:35 AM	34110
Ethylbenzene	0.51	0.19		mg/Kg	5	9/28/2017 11:39:35 AM	34110
Xylenes, Total	5.2	0.39		mg/Kg	5	9/28/2017 11:39:35 AM	34110
Surr: 4-Bromofluorobenzene	110	66.6-132		%Rec	5	9/28/2017 11:39:35 AM	34110

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1709F46

29-Sep-17

Client: Hilcorp Energy

Project: Lucerne 1

Sample ID	LCS-34111		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 34111		RunNo: 45950					
Prep Date:	9/27/2017		Analysis Date: 9/28/2017		SeqNo: 1460547		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.6		5.000		91.7	70	130			

Sample ID	MB-34111		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 34111		RunNo: 45950					
Prep Date:	9/27/2017		Analysis Date: 9/28/2017		SeqNo: 1460548		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.8		10.00		98.0	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1709F46

29-Sep-17

Client: Hilcorp Energy

Project: Lucerne 1

Sample ID	MB-34110		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBS		Batch ID: 34110		RunNo: 45958					
Prep Date:	9/27/2017		Analysis Date: 9/28/2017		SeqNo: 1461508		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	880		1000		88.0	54	150			

Sample ID	LCS-34110		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 34110		RunNo: 45958					
Prep Date:	9/27/2017		Analysis Date: 9/28/2017		SeqNo: 1461509		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	30	5.0	25.00	0	120	76.4	125			
Surr: BFB	1000		1000		102	54	150			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1709F46

29-Sep-17

Client: Hilcorp Energy

Project: Lucerne 1

Sample ID	MB-34110		SampType: MBLK		TestCode: EPA Method 8021B: Volatiles					
Client ID:	PBS		Batch ID: 34110		RunNo: 45958					
Prep Date:	9/27/2017		Analysis Date: 9/28/2017		SeqNo: 1461547		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		100	66.6	132			

Sample ID	LCS-34110		SampType: LCS		TestCode: EPA Method 8021B: Volatiles					
Client ID:	LCSS		Batch ID: 34110		RunNo: 45958					
Prep Date:	9/27/2017		Analysis Date: 9/28/2017		SeqNo: 1461559		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	106	80	120			
Toluene	1.1	0.050	1.000	0	106	80	120			
Ethylbenzene	1.1	0.050	1.000	0	109	80	120			
Xylenes, Total	3.3	0.10	3.000	0	111	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		106	66.6	132			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 1709F46

RcptNo: 1

Received By: Sophia Campuzano 9/28/2017 7:30:00 AM

Sophia Campuzano

Completed By: Sophia Campuzano 9/28/2017 8:40:05 AM

Sophia Campuzano

Reviewed By:

ENM

9/28/17

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Courier

Log In

4. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☒ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
9. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
11. Were any sample containers received broken? Yes ☐ No ☒
12. Does paperwork match bottle labels? Yes ☒ No ☐

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____
13. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
14. Is it clear what analyses were requested? Yes ☒ No ☐
15. Were all holding times able to be met? Yes ☒ No ☐

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date:

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.6	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 02, 2017

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1710F60

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 3 sample(s) on 10/31/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Removed by excavation -HW

Analytical Report

Lab Order 1710F60

Date Reported: 11/2/2017

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-32R

Project: Lucerne 1

Collection Date: 10/30/2017 1:30:00 PM

Lab ID: 1710F60-001

Matrix: MEOH (SOIL)

Received Date: 10/31/2017 8:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	620	9.4		mg/Kg	1	10/31/2017 11:37:44 AM	34718
Motor Oil Range Organics (MRO)	170	47		mg/Kg	1	10/31/2017 11:37:44 AM	34718
Surr: DNOP	101	70-130		%Rec	1	10/31/2017 11:37:44 AM	34718
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	270	18		mg/Kg	5	10/31/2017 11:35:12 AM	G46775
Surr: BFB	654	15-316	S	%Rec	5	10/31/2017 11:35:12 AM	G46775
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.16	0.092		mg/Kg	5	10/31/2017 11:35:12 AM	B46775
Toluene	ND	0.18		mg/Kg	5	10/31/2017 11:35:12 AM	B46775
Ethylbenzene	1.6	0.18		mg/Kg	5	10/31/2017 11:35:12 AM	B46775
Xylenes, Total	18	0.37		mg/Kg	5	10/31/2017 11:35:12 AM	B46775
Surr: 4-Bromofluorobenzene	145	80-120	S	%Rec	5	10/31/2017 11:35:12 AM	B46775

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank	Page 1 of 6
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified	

Removed by excavation -HW

Analytical Report

Lab Order 1710F60

Date Reported: 11/2/2017

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-33R

Project: Lucerne 1

Collection Date: 10/30/2017 1:45:00 PM

Lab ID: 1710F60-002

Matrix: MEOH (SOIL)

Received Date: 10/31/2017 8:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	180	9.8		mg/Kg	1	10/31/2017 12:05:16 PM	34718
Motor Oil Range Organics (MRO)	58	49		mg/Kg	1	10/31/2017 12:05:16 PM	34718
Surr: DNOP	90.7	70-130		%Rec	1	10/31/2017 12:05:16 PM	34718
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	22	17		mg/Kg	5	10/31/2017 12:22:55 PM	G46775
Surr: BFB	195	15-316		%Rec	5	10/31/2017 12:22:55 PM	G46775
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.087		mg/Kg	5	10/31/2017 12:22:55 PM	B46775
Toluene	ND	0.17		mg/Kg	5	10/31/2017 12:22:55 PM	B46775
Ethylbenzene	ND	0.17		mg/Kg	5	10/31/2017 12:22:55 PM	B46775
Xylenes, Total	ND	0.35		mg/Kg	5	10/31/2017 12:22:55 PM	B46775
Surr: 4-Bromofluorobenzene	111	80-120		%Rec	5	10/31/2017 12:22:55 PM	B46775

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1710F60

Date Reported: 11/2/2017

CLIENT: Rule Engineering LLC

Client Sample ID: SC-35

Project: Lucerne 1

Collection Date: 10/30/2017 2:00:00 PM

Lab ID: 1710F60-003

Matrix: MEOH (SOIL)

Received Date: 10/31/2017 8:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/31/2017 12:32:54 PM	34718
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/31/2017 12:32:54 PM	34718
Surr: DNOP	84.8	70-130		%Rec	1	10/31/2017 12:32:54 PM	34718
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.9		mg/Kg	1	10/31/2017 1:10:21 PM	G46775
Surr: BFB	106	15-316		%Rec	1	10/31/2017 1:10:21 PM	G46775
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.020		mg/Kg	1	10/31/2017 1:10:21 PM	B46775
Toluene	ND	0.039		mg/Kg	1	10/31/2017 1:10:21 PM	B46775
Ethylbenzene	ND	0.039		mg/Kg	1	10/31/2017 1:10:21 PM	B46775
Xylenes, Total	ND	0.079		mg/Kg	1	10/31/2017 1:10:21 PM	B46775
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	10/31/2017 1:10:21 PM	B46775

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1710F60

02-Nov-17

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	LCS-34718		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 34718		RunNo: 46767					
Prep Date:	10/31/2017		Analysis Date: 10/31/2017		SeqNo: 1490982		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	93.0	73.2	114			
Surr: DNOP	4.2		5.000		84.6	70	130			

Sample ID	MB-34718		SampType:	MBLK		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	PBS		Batch ID:	34718		RunNo:	46767				
Prep Date:	10/31/2017		Analysis Date:	10/31/2017		SeqNo:	1490986		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	ND	10									
Motor Oil Range Organics (MRO)	ND	50									
Surr: DNOP	8.6		10.00		85.8	70	130				

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1710F60

02-Nov-17

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBS	Batch ID:	G46775	RunNo:	46775					
Prep Date:		Analysis Date:	10/31/2017	SeqNo:	1491516	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1000		1000		100	15	316			

Sample ID	2.5UG GRO CCV	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	G46775	RunNo:	46775					
Prep Date:		Analysis Date:	10/31/2017	SeqNo:	1491517	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	103	75.9	131			
Surr: BFB	1100		1000		110	15	316			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1710F60

02-Nov-17

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	PBS	Batch ID:	B46775	RunNo:	46775					
Prep Date:		Analysis Date:	10/31/2017	SeqNo:	1491539	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		100	80	120			

Sample ID	100NG BTEX LCS	SampType:	LCS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	LCSS	Batch ID:	B46775	RunNo:	46775					
Prep Date:		Analysis Date:	10/31/2017	SeqNo:	1491540	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.5	77.3	128			
Toluene	0.97	0.050	1.000	0	97.0	79.2	125			
Ethylbenzene	0.96	0.050	1.000	0	96.3	80.7	127			
Xylenes, Total	2.9	0.10	3.000	0	96.7	81.6	129			
Surr: 4-Bromofluorobenzene	1.1		1.000		106	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1710F60

RcptNo: 1

Received By: Richie Eriacho

10/31/2017 8:15:00 AM

Completed By: Sophia Campuzano

10/31/2017 8:53:00 AM

Reviewed By: ENM

10/31/17

[Signature]
Sophia Campuzano

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Courier ☒ Yes ☐ No ☐ Not Present ☐

Log In

4. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
5. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☒ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
9. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
11. Were any sample containers received broken? Yes ☐ No ☒
12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
13. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
14. Is it clear what analyses were requested? Yes ☒ No ☐
15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:
(<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

17. Additional remarks: _____

18. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Yes			

Chain-of-Custody Record

Client:

Rule Engineering, LLC

Turn-Around Time:

☐ Standard
 ☒ Rush

Project Name:

Same Day

Mailing Address: 501 Airport Drive
Suite 105 Farmington, NM 87401
Phone #: 505 793 9486
email or Fax#: jvalde1@mlkengineering.com

QA/QC Package: ☒ Standard ☐ Level 4 (Full Validation)

Accreditation ☐ NELAP ☐ Other _____

☐ EDD (Type) _____

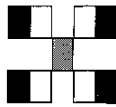
Project Manager:	Heather Woods
Sampler:	Justin Valdez
On Ice:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Temperature:	14

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No
1/30/17	1330	Soil	SC-32 K	W/407 Glass	Gold	1710FL60
1/30/17	1335	↓	SC-33 R	↓	↓	-001
1/30/17	1400	↓	SC-35	↓	↓	-002
						-003

[illegible]

Date:	1/30/17	Time:	1655	Relinquished by:	<i>Christa Vahala</i>	Received by:	<i>Christa Vahala</i>	Date:	10/30/17	Time:	1655
Date:	1/30/17	Time:	2046	Relinquished by:	<i>Christa Vahala</i>	Received by:	<i>Christa Vahala</i>	Date:	10/31/17	Time:	0815

if necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

[illegible]

Remarks:

Direct Bill to Hillcord



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 29, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1803D47

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 13 sample(s) on 3/24/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-36

Project: Lucerne 1

Collection Date: 3/23/2018 9:10:00 AM

Lab ID: 1803D47-001

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	3/28/2018 12:37:47 PM	37262
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/28/2018 12:37:47 PM	37262
Surr: DNOP	77.2	70-130		%Rec	1	3/28/2018 12:37:47 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	3/27/2018 5:20:34 PM	37235
Surr: BFB	92.5	15-316		%Rec	1	3/27/2018 5:20:34 PM	37235
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	3/27/2018 5:20:34 PM	37235
Toluene	ND	0.046		mg/Kg	1	3/27/2018 5:20:34 PM	37235
Ethylbenzene	ND	0.046		mg/Kg	1	3/27/2018 5:20:34 PM	37235
Xylenes, Total	ND	0.093		mg/Kg	1	3/27/2018 5:20:34 PM	37235
Surr: 4-Bromofluorobenzene	85.7	80-120		%Rec	1	3/27/2018 5:20:34 PM	37235

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-37

Project: Lucerne 1

Collection Date: 3/23/2018 9:16:00 AM

Lab ID: 1803D47-002

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	3/28/2018 1:02:05 PM	37262
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	3/28/2018 1:02:05 PM	37262
Surr: DNOP	77.5	70-130		%Rec	1	3/28/2018 1:02:05 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/27/2018 11:53:56 AM	37235
Surr: BFB	92.4	15-316		%Rec	1	3/27/2018 11:53:56 AM	37235
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	3/27/2018 11:53:56 AM	37235
Toluene	ND	0.048		mg/Kg	1	3/27/2018 11:53:56 AM	37235
Ethylbenzene	ND	0.048		mg/Kg	1	3/27/2018 11:53:56 AM	37235
Xylenes, Total	ND	0.096		mg/Kg	1	3/27/2018 11:53:56 AM	37235
Surr: 4-Bromofluorobenzene	86.6	80-120		%Rec	1	3/27/2018 11:53:56 AM	37235

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-38

Project: Lucerne 1

Collection Date: 3/23/2018 9:24:00 AM

Lab ID: 1803D47-003

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/28/2018 1:26:20 PM	37262
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/28/2018 1:26:20 PM	37262
Surr: DNOP	75.9	70-130		%Rec	1	3/28/2018 1:26:20 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/27/2018 12:17:23 PM	37235
Surr: BFB	93.9	15-316		%Rec	1	3/27/2018 12:17:23 PM	37235
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	3/27/2018 12:17:23 PM	37235
Toluene	ND	0.047		mg/Kg	1	3/27/2018 12:17:23 PM	37235
Ethylbenzene	ND	0.047		mg/Kg	1	3/27/2018 12:17:23 PM	37235
Xylenes, Total	ND	0.093		mg/Kg	1	3/27/2018 12:17:23 PM	37235
Surr: 4-Bromofluorobenzene	88.2	80-120		%Rec	1	3/27/2018 12:17:23 PM	37235

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-39

Project: Lucerne 1

Collection Date: 3/23/2018 9:30:00 AM

Lab ID: 1803D47-004

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	3/28/2018 1:50:44 PM	37262
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/28/2018 1:50:44 PM	37262
Surr: DNOP	73.4	70-130		%Rec	1	3/28/2018 1:50:44 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/27/2018 12:40:37 PM	37235
Surr: BFB	94.3	15-316		%Rec	1	3/27/2018 12:40:37 PM	37235
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	3/27/2018 12:40:37 PM	37235
Toluene	ND	0.047		mg/Kg	1	3/27/2018 12:40:37 PM	37235
Ethylbenzene	ND	0.047		mg/Kg	1	3/27/2018 12:40:37 PM	37235
Xylenes, Total	ND	0.094		mg/Kg	1	3/27/2018 12:40:37 PM	37235
Surr: 4-Bromofluorobenzene	88.4	80-120		%Rec	1	3/27/2018 12:40:37 PM	37235

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-40

Project: Lucerne 1

Collection Date: 3/23/2018 9:36:00 AM

Lab ID: 1803D47-005

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	3/28/2018 2:15:00 PM	37262
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	3/28/2018 2:15:00 PM	37262
Surr: DNOP	72.2	70-130		%Rec	1	3/28/2018 2:15:00 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/27/2018 1:03:56 PM	37235
Surr: BFB	94.4	15-316		%Rec	1	3/27/2018 1:03:56 PM	37235
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	3/27/2018 1:03:56 PM	37235
Toluene	ND	0.049		mg/Kg	1	3/27/2018 1:03:56 PM	37235
Ethylbenzene	ND	0.049		mg/Kg	1	3/27/2018 1:03:56 PM	37235
Xylenes, Total	ND	0.099		mg/Kg	1	3/27/2018 1:03:56 PM	37235
Surr: 4-Bromofluorobenzene	86.8	80-120		%Rec	1	3/27/2018 1:03:56 PM	37235

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-41

Project: Lucerne 1

Collection Date: 3/23/2018 9:43:00 AM

Lab ID: 1803D47-006

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	3/28/2018 2:39:25 PM	37262
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/28/2018 2:39:25 PM	37262
Surr: DNOP	72.5	70-130		%Rec	1	3/28/2018 2:39:25 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/27/2018 2:37:37 PM	37240
Surr: BFB	95.9	15-316		%Rec	1	3/27/2018 2:37:37 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	3/27/2018 2:37:37 PM	37240
Toluene	ND	0.048		mg/Kg	1	3/27/2018 2:37:37 PM	37240
Ethylbenzene	ND	0.048		mg/Kg	1	3/27/2018 2:37:37 PM	37240
Xylenes, Total	ND	0.096		mg/Kg	1	3/27/2018 2:37:37 PM	37240
Surr: 4-Bromofluorobenzene	87.9	80-120		%Rec	1	3/27/2018 2:37:37 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-42

Project: Lucerne 1

Collection Date: 3/23/2018 9:51:00 AM

Lab ID: 1803D47-007

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/28/2018 3:03:45 PM	37262
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/28/2018 3:03:45 PM	37262
Surr: DNOP	74.9	70-130		%Rec	1	3/28/2018 3:03:45 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/27/2018 7:17:13 PM	37240
Surr: BFB	93.2	15-316		%Rec	1	3/27/2018 7:17:13 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	3/27/2018 7:17:13 PM	37240
Toluene	ND	0.047		mg/Kg	1	3/27/2018 7:17:13 PM	37240
Ethylbenzene	ND	0.047		mg/Kg	1	3/27/2018 7:17:13 PM	37240
Xylenes, Total	ND	0.093		mg/Kg	1	3/27/2018 7:17:13 PM	37240
Surr: 4-Bromofluorobenzene	87.1	80-120		%Rec	1	3/27/2018 7:17:13 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-43

Project: Lucerne 1

Collection Date: 3/23/2018 9:55:00 AM

Lab ID: 1803D47-008

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	3/28/2018 3:28:24 PM	37262
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/28/2018 3:28:24 PM	37262
Surr: DNOP	76.7	70-130		%Rec	1	3/28/2018 3:28:24 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/27/2018 7:40:32 PM	37240
Surr: BFB	94.4	15-316		%Rec	1	3/27/2018 7:40:32 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	3/27/2018 7:40:32 PM	37240
Toluene	ND	0.049		mg/Kg	1	3/27/2018 7:40:32 PM	37240
Ethylbenzene	ND	0.049		mg/Kg	1	3/27/2018 7:40:32 PM	37240
Xylenes, Total	ND	0.097		mg/Kg	1	3/27/2018 7:40:32 PM	37240
Surr: 4-Bromofluorobenzene	86.3	80-120		%Rec	1	3/27/2018 7:40:32 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-44

Project: Lucerne 1

Collection Date: 3/23/2018 9:58:00 AM

Lab ID: 1803D47-009

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	3/28/2018 3:53:02 PM	37262
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/28/2018 3:53:02 PM	37262
Surr: DNOP	74.1	70-130		%Rec	1	3/28/2018 3:53:02 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/27/2018 8:03:49 PM	37240
Surr: BFB	94.0	15-316		%Rec	1	3/27/2018 8:03:49 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	3/27/2018 8:03:49 PM	37240
Toluene	ND	0.047		mg/Kg	1	3/27/2018 8:03:49 PM	37240
Ethylbenzene	ND	0.047		mg/Kg	1	3/27/2018 8:03:49 PM	37240
Xylenes, Total	ND	0.095		mg/Kg	1	3/27/2018 8:03:49 PM	37240
Surr: 4-Bromofluorobenzene	87.6	80-120		%Rec	1	3/27/2018 8:03:49 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-45

Project: Lucerne 1

Collection Date: 3/23/2018 10:02:00 AM

Lab ID: 1803D47-010

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	3/28/2018 4:17:40 PM	37262
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/28/2018 4:17:40 PM	37262
Surr: DNOP	77.0	70-130		%Rec	1	3/28/2018 4:17:40 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/27/2018 8:27:02 PM	37240
Surr: BFB	91.2	15-316		%Rec	1	3/27/2018 8:27:02 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	3/27/2018 8:27:02 PM	37240
Toluene	ND	0.047		mg/Kg	1	3/27/2018 8:27:02 PM	37240
Ethylbenzene	ND	0.047		mg/Kg	1	3/27/2018 8:27:02 PM	37240
Xylenes, Total	ND	0.094		mg/Kg	1	3/27/2018 8:27:02 PM	37240
Surr: 4-Bromofluorobenzene	83.7	80-120		%Rec	1	3/27/2018 8:27:02 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1803D47

Date Reported: 3/29/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-46

Project: Lucerne 1

Collection Date: 3/23/2018 10:10:00 AM

Lab ID: 1803D47-011

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/28/2018 4:42:12 PM	37262
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/28/2018 4:42:12 PM	37262
Surr: DNOP	78.4	70-130		%Rec	1	3/28/2018 4:42:12 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	3/27/2018 8:50:19 PM	37240
Surr: BFB	90.9	15-316		%Rec	1	3/27/2018 8:50:19 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	3/27/2018 8:50:19 PM	37240
Toluene	ND	0.046		mg/Kg	1	3/27/2018 8:50:19 PM	37240
Ethylbenzene	ND	0.046		mg/Kg	1	3/27/2018 8:50:19 PM	37240
Xylenes, Total	ND	0.092		mg/Kg	1	3/27/2018 8:50:19 PM	37240
Surr: 4-Bromofluorobenzene	84.9	80-120		%Rec	1	3/27/2018 8:50:19 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-47

Project: Lucerne 1

Collection Date: 3/23/2018 10:21:00 AM

Lab ID: 1803D47-012

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	3/28/2018 4:25:42 PM	37262
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	3/28/2018 4:25:42 PM	37262
Surr: DNOP	87.8	70-130		%Rec	1	3/28/2018 4:25:42 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/27/2018 10:23:03 PM	37240
Surr: BFB	90.2	15-316		%Rec	1	3/27/2018 10:23:03 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	3/27/2018 10:23:03 PM	37240
Toluene	ND	0.048		mg/Kg	1	3/27/2018 10:23:03 PM	37240
Ethylbenzene	ND	0.048		mg/Kg	1	3/27/2018 10:23:03 PM	37240
Xylenes, Total	ND	0.096		mg/Kg	1	3/27/2018 10:23:03 PM	37240
Surr: 4-Bromofluorobenzene	83.8	80-120		%Rec	1	3/27/2018 10:23:03 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1803D47**

Date Reported: **3/29/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-48

Project: Lucerne 1

Collection Date: 3/23/2018 10:29:00 AM

Lab ID: 1803D47-013

Matrix: SOIL

Received Date: 3/24/2018 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	3/28/2018 3:58:13 PM	37262
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/28/2018 3:58:13 PM	37262
Surr: DNOP	88.7	70-130		%Rec	1	3/28/2018 3:58:13 PM	37262
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/27/2018 10:46:17 PM	37240
Surr: BFB	95.2	15-316		%Rec	1	3/27/2018 10:46:17 PM	37240
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	3/27/2018 10:46:17 PM	37240
Toluene	ND	0.048		mg/Kg	1	3/27/2018 10:46:17 PM	37240
Ethylbenzene	ND	0.048		mg/Kg	1	3/27/2018 10:46:17 PM	37240
Xylenes, Total	ND	0.096		mg/Kg	1	3/27/2018 10:46:17 PM	37240
Surr: 4-Bromofluorobenzene	84.6	80-120		%Rec	1	3/27/2018 10:46:17 PM	37240

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1803D47

29-Mar-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	LCS-37276			SampType:	LCS			TestCode:	EPA Method 8015M/D: Diesel Range Organics		
Client ID:	LCSS			Batch ID:	37276			RunNo:	50137		
Prep Date:	3/27/2018			Analysis Date:	3/28/2018			SeqNo:	1624041 Units: %Rec		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Surr: DNOP	4.3		5.000		86.2	70	130				

Sample ID	MB-37276		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 37276		RunNo: 50137					
Prep Date:	3/27/2018		Analysis Date: 3/28/2018		SeqNo: 1624042		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.3		10.00		82.9	70	130			

Sample ID	LCS-37262		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 37262		RunNo: 50136					
Prep Date:	3/27/2018		Analysis Date: 3/28/2018		SeqNo: 1624049		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	98.4	70	130			
Surr: DNOP	4.4		5.000		87.7	70	130			

Sample ID	MB-37262	SampType: MBLK			TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS	Batch ID: 37262			RunNo: 50136					
Prep Date:	3/27/2018	Analysis Date: 3/28/2018			SeqNo: 1624050		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.2		10.00		91.6	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1803D47

29-Mar-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-37235		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBS		Batch ID: 37235		RunNo: 50113					
Prep Date:	3/26/2018		Analysis Date: 3/27/2018		SeqNo: 1622787		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	990		1000		99.0	15	316			

Sample ID	LCS-37235		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 37235		RunNo: 50113					
Prep Date:	3/26/2018		Analysis Date: 3/27/2018		SeqNo: 1622788		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	106	75.9	131			
Surr: BFB	1100		1000		111	15	316			

Sample ID	MB-37240		SampType:	MBLK		TestCode:	EPA Method 8015D: Gasoline Range				
Client ID:	PBS		Batch ID:	37240		RunNo:	50113				
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622795		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	ND	5.0									
Surr: BFB	960		1000		95.6	15	316				

Sample ID	LCS-37240		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 37240		RunNo: 50113					
Prep Date:	3/26/2018		Analysis Date: 3/27/2018		SeqNo: 1622796		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	102	75.9	131			
Surr: BFB	1100		1000		109	15	316			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1803D47

29-Mar-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-37235		SampType:	MBLK		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	PBS		Batch ID:	37235		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622821		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.93		1.000		92.6	80	120			

Sample ID	LCS-37235		SampType:	LCS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	LCSS		Batch ID:	37235		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622822		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	1.000	0	99.3	77.3	128			
Toluene	0.99	0.050	1.000	0	99.2	79.2	125			
Ethylbenzene	0.98	0.050	1.000	0	98.1	80.7	127			
Xylenes, Total	3.0	0.10	3.000	0	100	81.6	129			
Surr: 4-Bromofluorobenzene	0.92		1.000		92.0	80	120			

Sample ID	1803D47-001AMS		SampType:	MS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-36		Batch ID:	37235		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622825		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.024	0.9756	0	98.0	68.5	133			
Toluene	0.97	0.049	0.9756	0	99.0	75	130			
Ethylbenzene	0.96	0.049	0.9756	0	98.4	79.4	128			
Xylenes, Total	3.0	0.098	2.927	0	101	77.3	131			
Surr: 4-Bromofluorobenzene	0.86		0.9756		87.9	80	120			

Sample ID	1803D47-001AMSD		SampType:	MSD		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-36		Batch ID:	37235		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622826		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	0.9814	0	101	68.5	133	3.70	20	
Toluene	1.0	0.049	0.9814	0	102	75	130	3.66	20	
Ethylbenzene	1.0	0.049	0.9814	0	104	79.4	128	6.57	20	
Xylenes, Total	3.2	0.098	2.944	0	108	77.3	131	7.11	20	
Surr: 4-Bromofluorobenzene	0.86		0.9814		87.8	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1803D47

29-Mar-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-37240		SampType:	MBLK		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	PBS		Batch ID:	37240		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622831		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.89		1.000		89.1	80	120			

Sample ID	LCS-37240		SampType:	LCS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	LCSS		Batch ID:	37240		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622832		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	1.000	0	98.6	77.3	128			
Toluene	0.98	0.050	1.000	0	97.9	79.2	125			
Ethylbenzene	0.97	0.050	1.000	0	97.2	80.7	127			
Xylenes, Total	3.0	0.10	3.000	0	99.8	81.6	129			
Surr: 4-Bromofluorobenzene	0.91		1.000		91.3	80	120			

Sample ID	1803D47-006AMS		SampType:	MS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-41		Batch ID:	37240		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622835		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.024	0.9709	0	106	68.5	133			
Toluene	1.0	0.049	0.9709	0.009483	106	75	130			
Ethylbenzene	1.0	0.049	0.9709	0	107	79.4	128			
Xylenes, Total	3.2	0.097	2.913	0.02931	109	77.3	131			
Surr: 4-Bromofluorobenzene	0.87		0.9709		89.5	80	120			

Sample ID	1803D47-006AMSD		SampType:	MSD		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-41		Batch ID:	37240		RunNo:	50113			
Prep Date:	3/26/2018		Analysis Date:	3/27/2018		SeqNo:	1622836		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9960	0	105	68.5	133	2.48	20	
Toluene	1.1	0.050	0.9960	0.009483	106	75	130	2.24	20	
Ethylbenzene	1.0	0.050	0.9960	0	105	79.4	128	1.06	20	
Xylenes, Total	3.3	0.10	2.988	0.02931	108	77.3	131	1.45	20	
Surr: 4-Bromofluorobenzene	0.86		0.9960		86.6	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1803D47

RcptNo: 1

Received By: Ashley Gallegos

3/24/2018 9:00:00 AM

Completed By: Ashley Gallegos

3/24/2018 10:45:20 AM

Reviewed By: DDS

3/26/18

Labeled by: mw 3/26/18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels? Yes ☒ No ☐
(Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.7	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 07, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1805G33

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 17 sample(s) on 5/30/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-1

Project: Lucerne 1

Collection Date: 5/29/2018 9:07:00 AM

Lab ID: 1805G33-001

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	6/5/2018 6:05:54 PM	38438
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/5/2018 6:05:54 PM	38438
Surr: DNOP	102	70-130		%Rec	1	6/5/2018 6:05:54 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/2/2018 9:42:39 PM	38436
Surr: BFB	96.7	15-316		%Rec	1	6/2/2018 9:42:39 PM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/2/2018 9:42:39 PM	38436
Toluene	ND	0.048		mg/Kg	1	6/2/2018 9:42:39 PM	38436
Ethylbenzene	ND	0.048		mg/Kg	1	6/2/2018 9:42:39 PM	38436
Xylenes, Total	ND	0.097		mg/Kg	1	6/2/2018 9:42:39 PM	38436
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	6/2/2018 9:42:39 PM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-2

Project: Lucerne 1

Collection Date: 5/29/2018 9:12:00 AM

Lab ID: 1805G33-002

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	16	9.2		mg/Kg	1	6/5/2018 7:19:03 PM	38438
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/5/2018 7:19:03 PM	38438
Surr: DNOP	102	70-130		%Rec	1	6/5/2018 7:19:03 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/2/2018 10:05:52 PM	38436
Surr: BFB	98.4	15-316		%Rec	1	6/2/2018 10:05:52 PM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/2/2018 10:05:52 PM	38436
Toluene	ND	0.049		mg/Kg	1	6/2/2018 10:05:52 PM	38436
Ethylbenzene	ND	0.049		mg/Kg	1	6/2/2018 10:05:52 PM	38436
Xylenes, Total	ND	0.098		mg/Kg	1	6/2/2018 10:05:52 PM	38436
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	1	6/2/2018 10:05:52 PM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-3

Project: Lucerne 1

Collection Date: 5/29/2018 9:20:00 AM

Lab ID: 1805G33-003

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	6/5/2018 7:43:31 PM	38438
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/5/2018 7:43:31 PM	38438
Surr: DNOP	100	70-130		%Rec	1	6/5/2018 7:43:31 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/2/2018 10:29:09 PM	38436
Surr: BFB	96.6	15-316		%Rec	1	6/2/2018 10:29:09 PM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/2/2018 10:29:09 PM	38436
Toluene	0.11	0.049		mg/Kg	1	6/2/2018 10:29:09 PM	38436
Ethylbenzene	ND	0.049		mg/Kg	1	6/2/2018 10:29:09 PM	38436
Xylenes, Total	0.12	0.098		mg/Kg	1	6/2/2018 10:29:09 PM	38436
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	6/2/2018 10:29:09 PM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-4

Project: Lucerne 1

Collection Date: 5/29/2018 9:26:00 AM

Lab ID: 1805G33-004

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	35	9.2		mg/Kg	1	6/5/2018 8:07:47 PM	38438
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/5/2018 8:07:47 PM	38438
Surr: DNOP	102	70-130		%Rec	1	6/5/2018 8:07:47 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/2/2018 10:52:38 PM	38436
Surr: BFB	95.0	15-316		%Rec	1	6/2/2018 10:52:38 PM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	6/2/2018 10:52:38 PM	38436
Toluene	ND	0.047		mg/Kg	1	6/2/2018 10:52:38 PM	38436
Ethylbenzene	ND	0.047		mg/Kg	1	6/2/2018 10:52:38 PM	38436
Xylenes, Total	ND	0.093		mg/Kg	1	6/2/2018 10:52:38 PM	38436
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	6/2/2018 10:52:38 PM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-5

Project: Lucerne 1

Collection Date: 5/29/2018 9:34:00 AM

Lab ID: 1805G33-005

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	47	9.8		mg/Kg	1	6/5/2018 8:32:09 PM	38438
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/5/2018 8:32:09 PM	38438
Surr: DNOP	106	70-130		%Rec	1	6/5/2018 8:32:09 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/2/2018 11:15:53 PM	38436
Surr: BFB	117	15-316		%Rec	1	6/2/2018 11:15:53 PM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	6/2/2018 11:15:53 PM	38436
Toluene	ND	0.049		mg/Kg	1	6/2/2018 11:15:53 PM	38436
Ethylbenzene	ND	0.049		mg/Kg	1	6/2/2018 11:15:53 PM	38436
Xylenes, Total	ND	0.099		mg/Kg	1	6/2/2018 11:15:53 PM	38436
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	6/2/2018 11:15:53 PM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-6

Project: Lucerne 1

Collection Date: 5/29/2018 9:43:00 AM

Lab ID: 1805G33-006

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	41	10		mg/Kg	1	6/5/2018 8:56:21 PM	38438
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/5/2018 8:56:21 PM	38438
Surr: DNOP	102	70-130		%Rec	1	6/5/2018 8:56:21 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/3/2018 12:49:08 AM	38436
Surr: BFB	94.8	15-316		%Rec	1	6/3/2018 12:49:08 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/3/2018 12:49:08 AM	38436
Toluene	ND	0.049		mg/Kg	1	6/3/2018 12:49:08 AM	38436
Ethylbenzene	ND	0.049		mg/Kg	1	6/3/2018 12:49:08 AM	38436
Xylenes, Total	ND	0.098		mg/Kg	1	6/3/2018 12:49:08 AM	38436
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	6/3/2018 12:49:08 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-7

Project: Lucerne 1

Collection Date: 5/29/2018 9:51:00 AM

Lab ID: 1805G33-007

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	6/5/2018 9:20:39 PM	38438
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/5/2018 9:20:39 PM	38438
Surr: DNOP	99.8	70-130		%Rec	1	6/5/2018 9:20:39 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/3/2018 1:12:22 AM	38436
Surr: BFB	96.4	15-316		%Rec	1	6/3/2018 1:12:22 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	6/3/2018 1:12:22 AM	38436
Toluene	ND	0.046		mg/Kg	1	6/3/2018 1:12:22 AM	38436
Ethylbenzene	ND	0.046		mg/Kg	1	6/3/2018 1:12:22 AM	38436
Xylenes, Total	ND	0.093		mg/Kg	1	6/3/2018 1:12:22 AM	38436
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	6/3/2018 1:12:22 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-8

Project: Lucerne 1

Collection Date: 5/29/2018 10:00:00 AM

Lab ID: 1805G33-008

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	6/5/2018 9:44:47 PM	38438
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/5/2018 9:44:47 PM	38438
Surr: DNOP	100	70-130		%Rec	1	6/5/2018 9:44:47 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/3/2018 1:35:34 AM	38436
Surr: BFB	94.8	15-316		%Rec	1	6/3/2018 1:35:34 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/3/2018 1:35:34 AM	38436
Toluene	ND	0.048		mg/Kg	1	6/3/2018 1:35:34 AM	38436
Ethylbenzene	ND	0.048		mg/Kg	1	6/3/2018 1:35:34 AM	38436
Xylenes, Total	ND	0.095		mg/Kg	1	6/3/2018 1:35:34 AM	38436
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	6/3/2018 1:35:34 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-9

Project: Lucerne 1

Collection Date: 5/29/2018 10:10:00 AM

Lab ID: 1805G33-009

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	6/5/2018 10:09:01 PM	38438
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/5/2018 10:09:01 PM	38438
Surr: DNOP	99.2	70-130		%Rec	1	6/5/2018 10:09:01 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/3/2018 1:58:50 AM	38436
Surr: BFB	95.9	15-316		%Rec	1	6/3/2018 1:58:50 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	6/3/2018 1:58:50 AM	38436
Toluene	ND	0.046		mg/Kg	1	6/3/2018 1:58:50 AM	38436
Ethylbenzene	ND	0.046		mg/Kg	1	6/3/2018 1:58:50 AM	38436
Xylenes, Total	ND	0.092		mg/Kg	1	6/3/2018 1:58:50 AM	38436
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	6/3/2018 1:58:50 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-10

Project: Lucerne 1

Collection Date: 5/29/2018 10:19:00 AM

Lab ID: 1805G33-010

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	6/5/2018 10:33:01 PM	38438
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/5/2018 10:33:01 PM	38438
Surr: DNOP	102	70-130		%Rec	1	6/5/2018 10:33:01 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/3/2018 2:22:08 AM	38436
Surr: BFB	97.4	15-316		%Rec	1	6/3/2018 2:22:08 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	6/3/2018 2:22:08 AM	38436
Toluene	ND	0.047		mg/Kg	1	6/3/2018 2:22:08 AM	38436
Ethylbenzene	ND	0.047		mg/Kg	1	6/3/2018 2:22:08 AM	38436
Xylenes, Total	ND	0.094		mg/Kg	1	6/3/2018 2:22:08 AM	38436
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	6/3/2018 2:22:08 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-11

Project: Lucerne 1

Collection Date: 5/29/2018 10:25:00 AM

Lab ID: 1805G33-011

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	15	10		mg/Kg	1	6/5/2018 10:57:10 PM	38438
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/5/2018 10:57:10 PM	38438
Surr: DNOP	99.2	70-130		%Rec	1	6/5/2018 10:57:10 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/4/2018 2:28:11 PM	38436
Surr: BFB	101	15-316		%Rec	1	6/4/2018 2:28:11 PM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	6/4/2018 2:28:11 PM	38436
Toluene	ND	0.046		mg/Kg	1	6/4/2018 2:28:11 PM	38436
Ethylbenzene	ND	0.046		mg/Kg	1	6/4/2018 2:28:11 PM	38436
Xylenes, Total	ND	0.092		mg/Kg	1	6/4/2018 2:28:11 PM	38436
Surr: 4-Bromofluorobenzene	109	80-120		%Rec	1	6/4/2018 2:28:11 PM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-12

Project: Lucerne 1

Collection Date: 5/29/2018 10:31:00 AM

Lab ID: 1805G33-012

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	18	9.1		mg/Kg	1	6/5/2018 11:21:05 PM	38438
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/5/2018 11:21:05 PM	38438
Surr: DNOP	103	70-130		%Rec	1	6/5/2018 11:21:05 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/3/2018 3:08:58 AM	38436
Surr: BFB	97.5	15-316		%Rec	1	6/3/2018 3:08:58 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/3/2018 3:08:58 AM	38436
Toluene	ND	0.047		mg/Kg	1	6/3/2018 3:08:58 AM	38436
Ethylbenzene	ND	0.047		mg/Kg	1	6/3/2018 3:08:58 AM	38436
Xylenes, Total	ND	0.095		mg/Kg	1	6/3/2018 3:08:58 AM	38436
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	6/3/2018 3:08:58 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-13

Project: Lucerne 1

Collection Date: 5/29/2018 10:36:00 AM

Lab ID: 1805G33-013

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	23	9.7		mg/Kg	1	6/5/2018 11:45:12 PM	38438
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/5/2018 11:45:12 PM	38438
Surr: DNOP	105	70-130		%Rec	1	6/5/2018 11:45:12 PM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/3/2018 3:32:21 AM	38436
Surr: BFB	97.0	15-316		%Rec	1	6/3/2018 3:32:21 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/3/2018 3:32:21 AM	38436
Toluene	ND	0.049		mg/Kg	1	6/3/2018 3:32:21 AM	38436
Ethylbenzene	ND	0.049		mg/Kg	1	6/3/2018 3:32:21 AM	38436
Xylenes, Total	ND	0.097		mg/Kg	1	6/3/2018 3:32:21 AM	38436
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	6/3/2018 3:32:21 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-14

Project: Lucerne 1

Collection Date: 5/29/2018 10:43:00 AM

Lab ID: 1805G33-014

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	6/6/2018 12:09:09 AM	38438
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/6/2018 12:09:09 AM	38438
Surr: DNOP	99.6	70-130		%Rec	1	6/6/2018 12:09:09 AM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/3/2018 3:55:33 AM	38436
Surr: BFB	98.3	15-316		%Rec	1	6/3/2018 3:55:33 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/3/2018 3:55:33 AM	38436
Toluene	ND	0.047		mg/Kg	1	6/3/2018 3:55:33 AM	38436
Ethylbenzene	ND	0.047		mg/Kg	1	6/3/2018 3:55:33 AM	38436
Xylenes, Total	ND	0.095		mg/Kg	1	6/3/2018 3:55:33 AM	38436
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	6/3/2018 3:55:33 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-15

Project: Lucerne 1

Collection Date: 5/29/2018 10:45:00 AM

Lab ID: 1805G33-015

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	6/6/2018 12:33:09 AM	38438
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/6/2018 12:33:09 AM	38438
Surr: DNOP	84.7	70-130		%Rec	1	6/6/2018 12:33:09 AM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/3/2018 4:18:42 AM	38436
Surr: BFB	97.5	15-316		%Rec	1	6/3/2018 4:18:42 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	6/3/2018 4:18:42 AM	38436
Toluene	ND	0.047		mg/Kg	1	6/3/2018 4:18:42 AM	38436
Ethylbenzene	ND	0.047		mg/Kg	1	6/3/2018 4:18:42 AM	38436
Xylenes, Total	ND	0.095		mg/Kg	1	6/3/2018 4:18:42 AM	38436
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	6/3/2018 4:18:42 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-16

Project: Lucerne 1

Collection Date: 5/29/2018 10:52:00 AM

Lab ID: 1805G33-016

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	6/6/2018 12:57:05 AM	38438
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/6/2018 12:57:05 AM	38438
Surr: DNOP	88.2	70-130		%Rec	1	6/6/2018 12:57:05 AM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/3/2018 6:15:27 AM	38436
Surr: BFB	107	15-316		%Rec	1	6/3/2018 6:15:27 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	6/3/2018 6:15:27 AM	38436
Toluene	ND	0.046		mg/Kg	1	6/3/2018 6:15:27 AM	38436
Ethylbenzene	ND	0.046		mg/Kg	1	6/3/2018 6:15:27 AM	38436
Xylenes, Total	ND	0.093		mg/Kg	1	6/3/2018 6:15:27 AM	38436
Surr: 4-Bromofluorobenzene	112	80-120		%Rec	1	6/3/2018 6:15:27 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1805G33**

Date Reported: **6/7/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-17

Project: Lucerne 1

Collection Date: 5/29/2018 10:58:00 AM

Lab ID: 1805G33-017

Matrix: SOIL

Received Date: 5/30/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	6/6/2018 1:21:07 AM	38438
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/6/2018 1:21:07 AM	38438
Surr: DNOP	80.7	70-130		%Rec	1	6/6/2018 1:21:07 AM	38438
EPA METHOD 8015D: GASOLINE RANGE							Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/3/2018 6:38:50 AM	38436
Surr: BFB	98.7	15-316		%Rec	1	6/3/2018 6:38:50 AM	38436
EPA METHOD 8021B: VOLATILES							Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	6/3/2018 6:38:50 AM	38436
Toluene	ND	0.046		mg/Kg	1	6/3/2018 6:38:50 AM	38436
Ethylbenzene	ND	0.046		mg/Kg	1	6/3/2018 6:38:50 AM	38436
Xylenes, Total	ND	0.093		mg/Kg	1	6/3/2018 6:38:50 AM	38436
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	6/3/2018 6:38:50 AM	38436

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1805G33

07-Jun-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-38438		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 38438		RunNo: 51727					
Prep Date:	6/1/2018		Analysis Date: 6/5/2018		SeqNo: 1689440		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.7		10.00		97.0	70	130			

Sample ID	LCS-38438		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 38438		RunNo: 51727					
Prep Date:	6/1/2018		Analysis Date: 6/5/2018		SeqNo: 1689441		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	98.4	70	130			
Surr: DNOP	4.6		5.000		92.5	70	130			

Sample ID	1805G33-001AMS		SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-1		Batch ID: 38438		RunNo: 51727					
Prep Date:	6/1/2018		Analysis Date: 6/5/2018		SeqNo: 1690065		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.3	46.60	5.456	95.1	62	120			
Surr: DNOP	4.6		4.660		98.0	70	130			

Sample ID	1805G33-001AMSD		SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-1		Batch ID: 38438		RunNo: 51727					
Prep Date:	6/1/2018		Analysis Date: 6/5/2018		SeqNo: 1690066		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.2	46.21	5.456	96.5	62	120	0.561	20	
Surr: DNOP	4.3		4.621		94.1	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1805G33

07-Jun-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	1805G33-002AMS		SampType: MS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	SC-2		Batch ID: 38436		RunNo: 51695					
Prep Date:	6/1/2018		Analysis Date: 6/2/2018		SeqNo: 1686833		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	4.6	22.98	0	121	77.8	128			
Surr: BFB	1000		919.1		113	15	316			

Sample ID	1805G33-002AMSD		SampType:	MSD		TestCode:	EPA Method 8015D: Gasoline Range				
Client ID:	SC-2		Batch ID:	38436		RunNo:	51695				
Prep Date:	6/1/2018		Analysis Date:	6/2/2018		SeqNo:	1686834		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	26	4.6	23.17	0	113	77.8	128	5.68	20		
Surr: BFB	1000		926.8		113	15	316	0	0		

Sample ID	LCS-38436		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 38436		RunNo: 51695					
Prep Date:	6/1/2018		Analysis Date: 6/2/2018		SeqNo: 1686872		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	112	75.9	131			
Surr: BFB	1100		1000		109	15	316			

Sample ID	MB-38436		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBS		Batch ID: 38436		RunNo: 51695					
Prep Date:	6/1/2018		Analysis Date: 6/2/2018		SeqNo: 1686874		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	980		1000		98.1	15	316			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1805G33

07-Jun-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	1805G33-001AMS		SampType:	MS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-1		Batch ID:	38436		RunNo:	51695			
Prep Date:	6/1/2018		Analysis Date:	6/2/2018		SeqNo:	1686909		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	0.9823	0	98.4	68.5	133			
Toluene	1.0	0.049	0.9823	0	103	75	130			
Ethylbenzene	1.0	0.049	0.9823	0	105	79.4	128			
Xylenes, Total	3.2	0.098	2.947	0.01209	107	77.3	131			
Surr: 4-Bromofluorobenzene	1.0		0.9823		107	80	120			

Sample ID	1805G33-001AMSD		SampType:	MSD		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-1		Batch ID:	38436		RunNo:	51695			
Prep Date:	6/1/2018		Analysis Date:	6/2/2018		SeqNo:	1686910		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.024	0.9681	0	99.9	68.5	133	0.0300	20	
Toluene	1.0	0.048	0.9681	0	104	75	130	0.101	20	
Ethylbenzene	1.0	0.048	0.9681	0	106	79.4	128	1.26	20	
Xylenes, Total	3.1	0.097	2.904	0.01209	107	77.3	131	1.03	20	
Surr: 4-Bromofluorobenzene	1.0		0.9681		105	80	120	0	0	

Sample ID	LCS-38436		SampType:	LCS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	LCSS		Batch ID:	38436		RunNo:	51695			
Prep Date:	6/1/2018		Analysis Date:	6/2/2018		SeqNo:	1686927		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.1	77.3	128			
Toluene	0.99	0.050	1.000	0	99.3	79.2	125			
Ethylbenzene	0.99	0.050	1.000	0	99.1	80.7	127			
Xylenes, Total	3.1	0.10	3.000	0	102	81.6	129			
Surr: 4-Bromofluorobenzene	1.1		1.000		105	80	120			

Sample ID	MB-38436		SampType:	MBLK		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	PBS		Batch ID:	38436		RunNo:	51695			
Prep Date:	6/1/2018		Analysis Date:	6/2/2018		SeqNo:	1686929		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		106	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1805G33

RcptNo: 1

Received By: Anne Thorne

5/30/2018 6:50:00 AM

Anne Thorne

Completed By: Anne Thorne

5/31/2018 2:08:35 PM

Anne Thorne

Reviewed By: ENM

5/31/18

mm 5/31/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐

2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐

4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐

5. Sample(s) in proper container(s)? Yes ☒ No ☐

6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐

7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐

8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐

9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒

10. Were any sample containers received broken? Yes ☐ No ☒

11. Does paperwork match bottle labels? Yes ☒ No ☐

(Note discrepancies on chain of custody)

12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐

13. Is it clear what analyses were requested? Yes ☒ No ☐

14. Were all holding times able to be met? Yes ☒ No ☐

(If no, notify customer for authorization.)

of preserved
bottles checked
for pH: *5/31/18*

Adjusted? *mm*

Checked by: *mm*

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			

Chain-of-Custody Record

Turn-Around Time:

Client: Rule Engineering, LLC

☒ Standard ☐ Rush

Project Name:

Mailing Address: 501 Airport Dr Suite 703

Project #: Lucerne #1

Farmington NM 87401

Phone #: 505 743 9486

email or Fax#: jvaldez@ruleengineering.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Project Manager:

Heather Woods

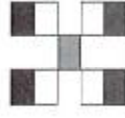
Sampler: Justin Gabez

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.2

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
5/24/18	907	Soil	SC-1	4061645	Cold	1805633
	912		SC-2			201
	920		SC-3			202
	926		SC-4			203
	934		SC-5			204
	943		SC-6			205
	951		SC-7			206
	1000		SC-8			207
	1010		SC-9			208
	1019		SC-10			209
	1025		SC-11			210
	1031		SC-12			212

Date:	Time:	Relinquished by:	Received by:	Date:	Time:
5/24/18	1614	<u>Justin Gabez</u>	<u>Justin Gabez</u>	5/29/18	1614
Date:	Time:	Relinquished by:	Received by:	Date:	Time:
5/29/18	1820	<u>Michael Jaree</u>	<u>Michael Jaree</u>	7/25/18	1652



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMBs (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:

Direct Bill to Hillcorp

Chain-of-Custody Record

Client: Rule Engineering, LLC

Mailing Address: 501 Airport Dr Suite 205 Farmington, NM 87401

Phone #: 505 793 9486

email or Fax#: jvaldez@ruleengineering.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Lucerne #1

Project #:

Project Manager:

Heather Woods

Sampler:

Justin Valdez

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.2

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
7/29/16	1036	Soil	SC-13	4006-1420	Cold	1805633
	1043		SC-14			2013
	1045		SC-15			2014
	1052		SC-16			2015
	1058		SC-17			2016
						2017

Date:	Time:	Relinquished by:	Received by:	Date:	Time:
7/29/16	1614	<u>Justin Valdez</u>	<u>Heather Woods</u>	5/29/18	1614
Date:	Time:	Relinquished by:	Received by:	Date:	Time:
7/29/16	1820	<u>Justin Valdez</u>	<u>Heather Woods</u>	5/29/18	1614



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

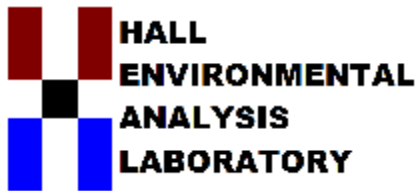
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:

Direct Bill to Hillcorp



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

July 17, 2018

Heather Woods
Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1807695

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 6 sample(s) on 7/13/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1807695**

Date Reported: **7/17/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-1

Project: Lucerne 1

Collection Date: 7/12/2018 1:38:00 PM

Lab ID: 1807695-001

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	19	9.8		mg/Kg	1	7/16/2018 3:20:35 PM	39206
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/16/2018 3:20:35 PM	39206
Surr: DNOP	87.8	70-130		%Rec	1	7/16/2018 3:20:35 PM	39206
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/16/2018 9:43:40 PM	39201
Surr: BFB	104	15-316		%Rec	1	7/16/2018 9:43:40 PM	39201
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	7/16/2018 9:43:40 PM	39201
Toluene	ND	0.048		mg/Kg	1	7/16/2018 9:43:40 PM	39201
Ethylbenzene	ND	0.048		mg/Kg	1	7/16/2018 9:43:40 PM	39201
Xylenes, Total	ND	0.096		mg/Kg	1	7/16/2018 9:43:40 PM	39201
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	7/16/2018 9:43:40 PM	39201

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1807695**

Date Reported: **7/17/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-2

Project: Lucerne 1

Collection Date: 7/12/2018 1:44:00 PM

Lab ID: 1807695-002

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	13	10		mg/Kg	1	7/16/2018 3:42:35 PM	39206
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2018 3:42:35 PM	39206
Surr: DNOP	92.2	70-130		%Rec	1	7/16/2018 3:42:35 PM	39206
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	5.2	5.0		mg/Kg	1	7/16/2018 10:06:55 PM	39201
Surr: BFB	126	15-316		%Rec	1	7/16/2018 10:06:55 PM	39201
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	7/16/2018 10:06:55 PM	39201
Toluene	ND	0.050		mg/Kg	1	7/16/2018 10:06:55 PM	39201
Ethylbenzene	ND	0.050		mg/Kg	1	7/16/2018 10:06:55 PM	39201
Xylenes, Total	0.16	0.099		mg/Kg	1	7/16/2018 10:06:55 PM	39201
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	7/16/2018 10:06:55 PM	39201

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1807695

Date Reported: 7/17/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-3

Project: Lucerne 1

Collection Date: 7/12/2018 1:50:00 PM

Lab ID: 1807695-003

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	39	9.9		mg/Kg	1	7/16/2018 4:04:34 PM	39206
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2018 4:04:34 PM	39206
Surr: DNOP	94.3	70-130		%Rec	1	7/16/2018 4:04:34 PM	39206
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	79	9.9		mg/Kg	2	7/16/2018 10:30:12 PM	39201
Surr: BFB	421	15-316	S	%Rec	2	7/16/2018 10:30:12 PM	39201
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.050		mg/Kg	2	7/16/2018 10:30:12 PM	39201
Toluene	ND	0.099		mg/Kg	2	7/16/2018 10:30:12 PM	39201
Ethylbenzene	0.32	0.099		mg/Kg	2	7/16/2018 10:30:12 PM	39201
Xylenes, Total	2.9	0.20		mg/Kg	2	7/16/2018 10:30:12 PM	39201
Surr: 4-Bromofluorobenzene	118	80-120		%Rec	2	7/16/2018 10:30:12 PM	39201

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank	Page 3 of 9
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified	

Removed by excavation -HW

Analytical Report

Lab Order 1807695

Date Reported: 7/17/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-8

Project: Lucerne 1

Collection Date: 7/12/2018 2:15:00 PM

Lab ID: 1807695-004

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	170	9.9		mg/Kg	1	7/16/2018 4:26:42 PM	39206
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/16/2018 4:26:42 PM	39206
Surr: DNOP	96.2	70-130		%Rec	1	7/16/2018 4:26:42 PM	39206
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	15	4.7		mg/Kg	1	7/16/2018 10:53:30 PM	39201
Surr: BFB	252	15-316		%Rec	1	7/16/2018 10:53:30 PM	39201
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.049	0.024		mg/Kg	1	7/16/2018 10:53:30 PM	39201
Toluene	ND	0.047		mg/Kg	1	7/16/2018 10:53:30 PM	39201
Ethylbenzene	0.083	0.047		mg/Kg	1	7/16/2018 10:53:30 PM	39201
Xylenes, Total	0.34	0.094		mg/Kg	1	7/16/2018 10:53:30 PM	39201
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	7/16/2018 10:53:30 PM	39201

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1807695

Date Reported: 7/17/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-9

Project: Lucerne 1

Collection Date: 7/12/2018 2:24:00 PM

Lab ID: 1807695-005

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	110	10		mg/Kg	1	7/16/2018 4:48:35 PM	39206
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2018 4:48:35 PM	39206
Surr: DNOP	97.6	70-130		%Rec	1	7/16/2018 4:48:35 PM	39206
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	14	4.8		mg/Kg	1	7/16/2018 11:16:47 PM	39201
Surr: BFB	229	15-316		%Rec	1	7/16/2018 11:16:47 PM	39201
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	7/16/2018 11:16:47 PM	39201
Toluene	ND	0.048		mg/Kg	1	7/16/2018 11:16:47 PM	39201
Ethylbenzene	ND	0.048		mg/Kg	1	7/16/2018 11:16:47 PM	39201
Xylenes, Total	0.14	0.097		mg/Kg	1	7/16/2018 11:16:47 PM	39201
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	7/16/2018 11:16:47 PM	39201

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank	Page 5 of 9
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified	

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1807695**

Date Reported: **7/17/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-10

Project: Lucerne 1

Collection Date: 7/12/2018 2:36:00 PM

Lab ID: 1807695-006

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/16/2018 5:10:43 PM	39206
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/16/2018 5:10:43 PM	39206
Surr: DNOP	91.6	70-130		%Rec	1	7/16/2018 5:10:43 PM	39206
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	7/16/2018 11:40:06 PM	39201
Surr: BFB	89.3	15-316		%Rec	1	7/16/2018 11:40:06 PM	39201
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	7/16/2018 11:40:06 PM	39201
Toluene	ND	0.047		mg/Kg	1	7/16/2018 11:40:06 PM	39201
Ethylbenzene	ND	0.047		mg/Kg	1	7/16/2018 11:40:06 PM	39201
Xylenes, Total	ND	0.095		mg/Kg	1	7/16/2018 11:40:06 PM	39201
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	7/16/2018 11:40:06 PM	39201

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1807695

17-Jul-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39206		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 39206		RunNo: 52724					
Prep Date:	7/13/2018		Analysis Date: 7/16/2018		SeqNo: 1731136		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.1		10.00		90.7	70	130			

Sample ID	LCS-39206		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 39206		RunNo: 52724					
Prep Date:	7/13/2018		Analysis Date: 7/16/2018		SeqNo: 1731137		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	95.9	70	130			
Surr: DNOP	4.3		5.000		85.8	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1807695

17-Jul-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39201		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBS		Batch ID: 39201		RunNo: 52729					
Prep Date:	7/13/2018		Analysis Date: 7/16/2018		SeqNo: 1731622		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	910		1000		91.0	15	316			

Sample ID	LCS-39201		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 39201		RunNo: 52729					
Prep Date:	7/13/2018		Analysis Date: 7/16/2018		SeqNo: 1731623		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	108	75.9	131			
Surr: BFB	980		1000		98.5	15	316			

Sample ID	1807695-001AMS		SampType: MS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	SC-1		Batch ID: 39201		RunNo: 52729					
Prep Date:	7/13/2018		Analysis Date: 7/16/2018		SeqNo: 1731627		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	30	4.8	23.97	1.996	115	77.8	128			
Surr: BFB	1200		958.8		127	15	316			

Sample ID	1807695-001AMSD		SampType:	MSD		TestCode:	EPA Method 8015D: Gasoline Range				
Client ID:	SC-1		Batch ID:	39201		RunNo:	52729				
Prep Date:	7/13/2018		Analysis Date:	7/16/2018		SeqNo:	1731628		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	29	4.7	23.32	1.996	114	77.8	128	3.52	20		
Surr: BFB	1100		932.8		117	15	316	0	0		

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1807695

17-Jul-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39201		SampType:	MBLK		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	PBS		Batch ID:	39201		RunNo:	52729			
Prep Date:	7/13/2018		Analysis Date:	7/16/2018		SeqNo:	1731659		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID	LCS-39201		SampType:	LCS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	LCSS		Batch ID:	39201		RunNo:	52729			
Prep Date:	7/13/2018		Analysis Date:	7/16/2018		SeqNo:	1731660		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	95.2	77.3	128			
Toluene	0.98	0.050	1.000	0	97.6	79.2	125			
Ethylbenzene	0.95	0.050	1.000	0	95.3	80.7	127			
Xylenes, Total	2.9	0.10	3.000	0	98.0	81.6	129			
Surr: 4-Bromofluorobenzene	1.0		1.000		103	80	120			

Sample ID	1807695-002AMS		SampType:	MS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-2		Batch ID:	39201		RunNo:	52729			
Prep Date:	7/13/2018		Analysis Date:	7/16/2018		SeqNo:	1731666		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.024	0.9542	0.01042	95.3	68.5	133			
Toluene	0.96	0.048	0.9542	0	100	75	130			
Ethylbenzene	0.97	0.048	0.9542	0.03115	98.0	79.4	128			
Xylenes, Total	3.0	0.095	2.863	0.1617	99.5	77.3	131			
Surr: 4-Bromofluorobenzene	1.0		0.9542		109	80	120			

Sample ID	1807695-002AMSD		SampType:	MSD		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-2		Batch ID:	39201		RunNo:	52729			
Prep Date:	7/13/2018		Analysis Date:	7/16/2018		SeqNo:	1731667		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	0.9814	0.01042	96.4	68.5	133	3.96	20	
Toluene	1.0	0.049	0.9814	0	102	75	130	4.21	20	
Ethylbenzene	1.0	0.049	0.9814	0.03115	99.6	79.4	128	4.25	20	
Xylenes, Total	3.1	0.098	2.944	0.1617	101	77.3	131	3.85	20	
Surr: 4-Bromofluorobenzene	1.1		0.9814		109	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1807695

RcptNo: 1

Received By: Anne Thorne

7/13/2018 8:05:00 AM

Anne Thorne

Completed By: Anne Thorne

7/13/2018 9:28:48 AM

Anne Thorne

Reviewed By:

WVZ 07/13/18

Lb: JAB 07/13/18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: 3
(<2 or >2 unless noted)
Adjusted? Yes
Checked by: WVZ 07/13/18

Special Handling (if applicable)

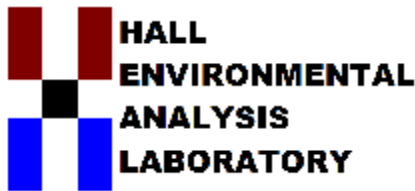
15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.0	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

July 17, 2018

Heather Woods
Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1807688

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 4 sample(s) on 7/13/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1807688**

Date Reported: **7/17/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-4

Project: Lucerne 1

Collection Date: 7/12/2018 1:58:00 PM

Lab ID: 1807688-001

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	7/13/2018 10:19:19 AM	A52678
Surr: BFB	110	70-130		%Rec	1	7/13/2018 10:19:19 AM	A52678
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/13/2018 12:05:04 PM	39192
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/13/2018 12:05:04 PM	39192
Surr: DNOP	103	70-130		%Rec	1	7/13/2018 12:05:04 PM	39192
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.019		mg/Kg	1	7/13/2018 10:19:19 AM	S52678
Toluene	ND	0.038		mg/Kg	1	7/13/2018 10:19:19 AM	S52678
Ethylbenzene	ND	0.038		mg/Kg	1	7/13/2018 10:19:19 AM	S52678
Xylenes, Total	ND	0.075		mg/Kg	1	7/13/2018 10:19:19 AM	S52678
Surr: 4-Bromofluorobenzene	124	70-130		%Rec	1	7/13/2018 10:19:19 AM	S52678
Surr: Toluene-d8	95.4	70-130		%Rec	1	7/13/2018 10:19:19 AM	S52678

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1807688**

Date Reported: **7/17/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-5

Project: Lucerne 1

Collection Date: 7/12/2018 2:11:00 PM

Lab ID: 1807688-002

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	7/13/2018 10:42:24 AM	A52678
Surr: BFB	111	70-130		%Rec	1	7/13/2018 10:42:24 AM	A52678
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	7/13/2018 12:27:06 PM	39192
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/13/2018 12:27:06 PM	39192
Surr: DNOP	102	70-130		%Rec	1	7/13/2018 12:27:06 PM	39192
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.019		mg/Kg	1	7/13/2018 10:42:24 AM	S52678
Toluene	ND	0.038		mg/Kg	1	7/13/2018 10:42:24 AM	S52678
Ethylbenzene	ND	0.038		mg/Kg	1	7/13/2018 10:42:24 AM	S52678
Xylenes, Total	ND	0.076		mg/Kg	1	7/13/2018 10:42:24 AM	S52678
Surr: 4-Bromofluorobenzene	124	70-130		%Rec	1	7/13/2018 10:42:24 AM	S52678
Surr: Toluene-d8	92.6	70-130		%Rec	1	7/13/2018 10:42:24 AM	S52678

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1807688**

Date Reported: **7/17/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-6

Project: Lucerne 1

Collection Date: 7/12/2018 2:22:00 PM

Lab ID: 1807688-003

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.3		mg/Kg	1	7/13/2018 11:05:36 AM	A52678
Surr: BFB	111	70-130		%Rec	1	7/13/2018 11:05:36 AM	A52678
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/13/2018 12:49:08 PM	39192
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/13/2018 12:49:08 PM	39192
Surr: DNOP	102	70-130		%Rec	1	7/13/2018 12:49:08 PM	39192
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.017		mg/Kg	1	7/13/2018 11:05:36 AM	S52678
Toluene	ND	0.033		mg/Kg	1	7/13/2018 11:05:36 AM	S52678
Ethylbenzene	ND	0.033		mg/Kg	1	7/13/2018 11:05:36 AM	S52678
Xylenes, Total	ND	0.066		mg/Kg	1	7/13/2018 11:05:36 AM	S52678
Surr: 4-Bromofluorobenzene	125	70-130		%Rec	1	7/13/2018 11:05:36 AM	S52678
Surr: Toluene-d8	94.0	70-130		%Rec	1	7/13/2018 11:05:36 AM	S52678

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1807688**

Date Reported: **7/17/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-7

Project: Lucerne 1

Collection Date: 7/12/2018 2:02:00 PM

Lab ID: 1807688-004

Matrix: SOIL

Received Date: 7/13/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	7/13/2018 11:28:46 AM	A52678
Surr: BFB	110	70-130		%Rec	1	7/13/2018 11:28:46 AM	A52678
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/13/2018 1:11:16 PM	39192
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	7/13/2018 1:11:16 PM	39192
Surr: DNOP	104	70-130		%Rec	1	7/13/2018 1:11:16 PM	39192
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.019		mg/Kg	1	7/13/2018 11:28:46 AM	S52678
Toluene	ND	0.038		mg/Kg	1	7/13/2018 11:28:46 AM	S52678
Ethylbenzene	ND	0.038		mg/Kg	1	7/13/2018 11:28:46 AM	S52678
Xylenes, Total	ND	0.077		mg/Kg	1	7/13/2018 11:28:46 AM	S52678
Surr: 4-Bromofluorobenzene	124	70-130		%Rec	1	7/13/2018 11:28:46 AM	S52678
Surr: Toluene-d8	92.6	70-130		%Rec	1	7/13/2018 11:28:46 AM	S52678

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1807688

17-Jul-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39192		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 39192		RunNo: 52681					
Prep Date:	7/13/2018		Analysis Date: 7/13/2018		SeqNo: 1729526		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.5		10.00		94.9	70	130			

Sample ID	LCS-39192		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 39192		RunNo: 52681					
Prep Date:	7/13/2018		Analysis Date: 7/13/2018		SeqNo: 1729527		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	92.3	70	130			
Surr: DNOP	4.6		5.000		91.5	70	130			

Sample ID	1807688-004AMS		SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-7		Batch ID: 39192		RunNo: 52681					
Prep Date:	7/13/2018		Analysis Date: 7/13/2018		SeqNo: 1730815		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.10	0	102	62	120			
Surr: DNOP	4.8		5.010		95.2	70	130			

Sample ID	1807688-004AMSD		SampType:	MSD		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	SC-7		Batch ID:	39192		RunNo:	52681				
Prep Date:	7/13/2018		Analysis Date:	7/13/2018		SeqNo:	1730816		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	57	10	49.95	0	114	62	120	11.0	20		
Surr: DNOP	4.8		4.995		96.5	70	130	0	0		

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1807688

17-Jul-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	PBS	Batch ID:	S52678	RunNo:	52678					
Prep Date:		Analysis Date:	7/13/2018	SeqNo:	1729753	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.56		0.5000		112	70	130			
Surr: Toluene-d8	0.49		0.5000		98.4	70	130			

Sample ID	1807688-002ams	SampType:	MS4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-5	Batch ID:	S52678	RunNo:	52678					
Prep Date:		Analysis Date:	7/13/2018	SeqNo:	1730197	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.75	0.019	0.7628	0	98.1	80	120			
Toluene	0.77	0.038	0.7628	0	101	80	120			
Ethylbenzene	0.79	0.038	0.7628	0	103	82	121			
Xylenes, Total	2.4	0.076	2.288	0.01778	104	80.2	120			
Surr: 4-Bromofluorobenzene	0.40		0.3814		104	70	130			
Surr: Toluene-d8	0.35		0.3814		92.4	70	130			

Sample ID	1807688-002amsd	SampType:	MSD4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-5	Batch ID:	S52678	RunNo:	52678					
Prep Date:		Analysis Date:	7/13/2018	SeqNo:	1730198	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.75	0.019	0.7628	0	97.9	80	120	0.135	20	
Toluene	0.75	0.038	0.7628	0	99.0	80	120	1.62	20	
Ethylbenzene	0.79	0.038	0.7628	0	103	82	121	0.0794	20	
Xylenes, Total	2.4	0.076	2.288	0.01778	105	80.2	120	0.629	20	
Surr: 4-Bromofluorobenzene	0.41		0.3814		107	70	130	0	0	
Surr: Toluene-d8	0.35		0.3814		92.4	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1807688

17-Jul-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	2.5ug gro lcs	SampType: LCS			TestCode: EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS	Batch ID: A52678			RunNo: 52678					
Prep Date:		Analysis Date: 7/13/2018			SeqNo: 1729480		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	105	70	130			
Surr: BFB	440		500.0		88.4	70	130			

Sample ID	rb	SampType: MBLK			TestCode: EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS	Batch ID: A52678			RunNo: 52678					
Prep Date:		Analysis Date: 7/13/2018			SeqNo: 1729481		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	500		500.0		99.7	70	130			

Sample ID	1807688-001ams		SampType: MS		TestCode: EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-4		Batch ID: A52678		RunNo: 52678					
Prep Date:			Analysis Date: 7/13/2018		SeqNo: 1730195		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	3.8	18.84	0	102	64.7	142			
Surr: BFB	370		376.8		97.1	70	130			

Sample ID	1807688-001amsd		SampType: MSD		TestCode: EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-4		Batch ID: A52678		RunNo: 52678					
Prep Date:			Analysis Date: 7/13/2018		SeqNo: 1730196		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	3.8	18.84	0	101	64.7	142	0.867	20	
Surr: BFB	370		376.8		97.3	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1807688

RcptNo: 1

Received By: Anne Thorne 7/13/2018 8:05:00 AM

Completed By: Anne Thorne 7/13/2018 8:22:34 AM

Reviewed By: ENM 7/13/18

Labeled by: AS 07/13/18

Anne Thorne

Anne Thorne

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.0	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 03, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1808105

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 10 sample(s) on 8/2/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Removed by excavation -HW

Analytical Report

Lab Order 1808105

Date Reported: 8/3/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-3

Project: Lucerne 1

Collection Date: 8/1/2018 10:08:00 AM

Lab ID: 1808105-001

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	36	19		mg/Kg	5	8/2/2018 10:33:57 AM	A53167
Surr: BFB	110	70-130		%Rec	5	8/2/2018 10:33:57 AM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	74	10		mg/Kg	1	8/2/2018 10:07:27 AM	39550
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/2/2018 10:07:27 AM	39550
Surr: DNOP	96.0	50.6-138		%Rec	1	8/2/2018 10:07:27 AM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.093		mg/Kg	5	8/2/2018 10:33:57 AM	B53167
Toluene	ND	0.19		mg/Kg	5	8/2/2018 10:33:57 AM	B53167
Ethylbenzene	ND	0.19		mg/Kg	5	8/2/2018 10:33:57 AM	B53167
Xylenes, Total	0.40	0.37		mg/Kg	5	8/2/2018 10:33:57 AM	B53167
Surr: 4-Bromofluorobenzene	121	70-130		%Rec	5	8/2/2018 10:33:57 AM	B53167
Surr: Toluene-d8	97.4	70-130		%Rec	5	8/2/2018 10:33:57 AM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808105**

Date Reported: **8/3/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-8

Project: Lucerne 1

Collection Date: 8/1/2018 9:49:00 AM

Lab ID: 1808105-002

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.9		mg/Kg	1	8/2/2018 10:57:02 AM	A53167
Surr: BFB	109	70-130		%Rec	1	8/2/2018 10:57:02 AM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/2/2018 10:31:52 AM	39550
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/2/2018 10:31:52 AM	39550
Surr: DNOP	97.5	50.6-138		%Rec	1	8/2/2018 10:31:52 AM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.020		mg/Kg	1	8/2/2018 10:57:02 AM	B53167
Toluene	ND	0.039		mg/Kg	1	8/2/2018 10:57:02 AM	B53167
Ethylbenzene	ND	0.039		mg/Kg	1	8/2/2018 10:57:02 AM	B53167
Xylenes, Total	ND	0.079		mg/Kg	1	8/2/2018 10:57:02 AM	B53167
Surr: 4-Bromofluorobenzene	122	70-130		%Rec	1	8/2/2018 10:57:02 AM	B53167
Surr: Toluene-d8	97.0	70-130		%Rec	1	8/2/2018 10:57:02 AM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808105**

Date Reported: **8/3/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-9

Project: Lucerne 1

Collection Date: 8/1/2018 9:42:00 AM

Lab ID: 1808105-003

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	8/2/2018 11:20:10 AM	A53167
Surr: BFB	109	70-130		%Rec	1	8/2/2018 11:20:10 AM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/2/2018 10:56:23 AM	39550
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/2/2018 10:56:23 AM	39550
Surr: DNOP	98.9	50.6-138		%Rec	1	8/2/2018 10:56:23 AM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.019		mg/Kg	1	8/2/2018 11:20:10 AM	B53167
Toluene	ND	0.037		mg/Kg	1	8/2/2018 11:20:10 AM	B53167
Ethylbenzene	ND	0.037		mg/Kg	1	8/2/2018 11:20:10 AM	B53167
Xylenes, Total	ND	0.074		mg/Kg	1	8/2/2018 11:20:10 AM	B53167
Surr: 4-Bromofluorobenzene	123	70-130		%Rec	1	8/2/2018 11:20:10 AM	B53167
Surr: Toluene-d8	96.9	70-130		%Rec	1	8/2/2018 11:20:10 AM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1808105

Date Reported: 8/3/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-17

Project: Lucerne 1

Collection Date: 8/1/2018 10:19:00 AM

Lab ID: 1808105-004

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	21	19		mg/Kg	5	8/2/2018 11:43:20 AM	A53167
Surr: BFB	107	70-130		%Rec	5	8/2/2018 11:43:20 AM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	170	9.9		mg/Kg	1	8/2/2018 11:20:46 AM	39550
Motor Oil Range Organics (MRO)	52	50		mg/Kg	1	8/2/2018 11:20:46 AM	39550
Surr: DNOP	105	50.6-138		%Rec	1	8/2/2018 11:20:46 AM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.093		mg/Kg	5	8/2/2018 11:43:20 AM	B53167
Toluene	ND	0.19		mg/Kg	5	8/2/2018 11:43:20 AM	B53167
Ethylbenzene	ND	0.19		mg/Kg	5	8/2/2018 11:43:20 AM	B53167
Xylenes, Total	ND	0.37		mg/Kg	5	8/2/2018 11:43:20 AM	B53167
Surr: 4-Bromofluorobenzene	119	70-130		%Rec	5	8/2/2018 11:43:20 AM	B53167
Surr: Toluene-d8	99.0	70-130		%Rec	5	8/2/2018 11:43:20 AM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1808105

Date Reported: 8/3/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-18

Project: Lucerne 1

Collection Date: 8/1/2018 10:10:00 AM

Lab ID: 1808105-005

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	140	19		mg/Kg	5	8/2/2018 12:06:30 PM	A53167
Surr: BFB	105	70-130		%Rec	5	8/2/2018 12:06:30 PM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	270	9.9		mg/Kg	1	8/2/2018 11:45:17 AM	39550
Motor Oil Range Organics (MRO)	71	49		mg/Kg	1	8/2/2018 11:45:17 AM	39550
Surr: DNOP	102	50.6-138		%Rec	1	8/2/2018 11:45:17 AM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.093		mg/Kg	5	8/2/2018 12:06:30 PM	B53167
Toluene	ND	0.19		mg/Kg	5	8/2/2018 12:06:30 PM	B53167
Ethylbenzene	ND	0.19		mg/Kg	5	8/2/2018 12:06:30 PM	B53167
Xylenes, Total	3.7	0.37		mg/Kg	5	8/2/2018 12:06:30 PM	B53167
Surr: 4-Bromofluorobenzene	121	70-130		%Rec	5	8/2/2018 12:06:30 PM	B53167
Surr: Toluene-d8	100	70-130		%Rec	5	8/2/2018 12:06:30 PM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808105**

Date Reported: **8/3/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-19

Project: Lucerne 1

Collection Date: 8/1/2018 10:46:00 AM

Lab ID: 1808105-006

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	8/2/2018 12:29:39 PM	A53167
Surr: BFB	110	70-130		%Rec	1	8/2/2018 12:29:39 PM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/2/2018 12:09:40 PM	39550
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/2/2018 12:09:40 PM	39550
Surr: DNOP	100	50.6-138		%Rec	1	8/2/2018 12:09:40 PM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.018		mg/Kg	1	8/2/2018 12:29:39 PM	B53167
Toluene	ND	0.037		mg/Kg	1	8/2/2018 12:29:39 PM	B53167
Ethylbenzene	ND	0.037		mg/Kg	1	8/2/2018 12:29:39 PM	B53167
Xylenes, Total	ND	0.074		mg/Kg	1	8/2/2018 12:29:39 PM	B53167
Surr: 4-Bromofluorobenzene	124	70-130		%Rec	1	8/2/2018 12:29:39 PM	B53167
Surr: Toluene-d8	96.6	70-130		%Rec	1	8/2/2018 12:29:39 PM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1808105

Date Reported: 8/3/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-20

Project: Lucerne 1

Collection Date: 8/1/2018 10:33:00 AM

Lab ID: 1808105-007

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	150	19		mg/Kg	5	8/2/2018 1:05:38 PM	A53167
Surr: BFB	106	70-130		%Rec	5	8/2/2018 1:05:38 PM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	220	9.8		mg/Kg	1	8/2/2018 12:34:19 PM	39550
Motor Oil Range Organics (MRO)	93	49		mg/Kg	1	8/2/2018 12:34:19 PM	39550
Surr: DNOP	102	50.6-138		%Rec	1	8/2/2018 12:34:19 PM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.095		mg/Kg	5	8/2/2018 1:05:38 PM	B53167
Toluene	0.33	0.19		mg/Kg	5	8/2/2018 1:05:38 PM	B53167
Ethylbenzene	0.21	0.19		mg/Kg	5	8/2/2018 1:05:38 PM	B53167
Xylenes, Total	3.6	0.38		mg/Kg	5	8/2/2018 1:05:38 PM	B53167
Surr: 4-Bromofluorobenzene	119	70-130		%Rec	5	8/2/2018 1:05:38 PM	B53167
Surr: Toluene-d8	100	70-130		%Rec	5	8/2/2018 1:05:38 PM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808105**Date Reported: **8/3/2018****CLIENT:** Rule Engineering LLC**Client Sample ID:** SC-21**Project:** Lucerne 1**Collection Date:** 8/1/2018 10:38:00 AM**Lab ID:** 1808105-008**Matrix:** SOIL**Received Date:** 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	18		mg/Kg	5	8/2/2018 1:28:51 PM	A53167
Surr: BFB	100	70-130		%Rec	5	8/2/2018 1:28:51 PM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/2/2018 12:58:47 PM	39550
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/2/2018 12:58:47 PM	39550
Surr: DNOP	97.6	50.6-138		%Rec	1	8/2/2018 12:58:47 PM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.090		mg/Kg	5	8/2/2018 1:28:51 PM	B53167
Toluene	ND	0.18		mg/Kg	5	8/2/2018 1:28:51 PM	B53167
Ethylbenzene	ND	0.18		mg/Kg	5	8/2/2018 1:28:51 PM	B53167
Xylenes, Total	ND	0.36		mg/Kg	5	8/2/2018 1:28:51 PM	B53167
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	5	8/2/2018 1:28:51 PM	B53167
Surr: Toluene-d8	102	70-130		%Rec	5	8/2/2018 1:28:51 PM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808105**

Date Reported: **8/3/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-22

Project: Lucerne 1

Collection Date: 8/1/2018 10:55:00 AM

Lab ID: 1808105-009

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	8/2/2018 1:52:05 PM	A53167
Surr: BFB	107	70-130		%Rec	1	8/2/2018 1:52:05 PM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/2/2018 1:23:31 PM	39550
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/2/2018 1:23:31 PM	39550
Surr: DNOP	100	50.6-138		%Rec	1	8/2/2018 1:23:31 PM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.018		mg/Kg	1	8/2/2018 1:52:05 PM	B53167
Toluene	ND	0.037		mg/Kg	1	8/2/2018 1:52:05 PM	B53167
Ethylbenzene	ND	0.037		mg/Kg	1	8/2/2018 1:52:05 PM	B53167
Xylenes, Total	ND	0.074		mg/Kg	1	8/2/2018 1:52:05 PM	B53167
Surr: 4-Bromofluorobenzene	120	70-130		%Rec	1	8/2/2018 1:52:05 PM	B53167
Surr: Toluene-d8	95.8	70-130		%Rec	1	8/2/2018 1:52:05 PM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808105**

Date Reported: **8/3/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-23

Project: Lucerne 1

Collection Date: 8/1/2018 10:25:00 AM

Lab ID: 1808105-010

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.6		mg/Kg	1	8/2/2018 2:15:20 PM	A53167
Surr: BFB	108	70-130		%Rec	1	8/2/2018 2:15:20 PM	A53167
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/2/2018 1:48:03 PM	39550
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/2/2018 1:48:03 PM	39550
Surr: DNOP	98.3	50.6-138		%Rec	1	8/2/2018 1:48:03 PM	39550
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.018		mg/Kg	1	8/2/2018 2:15:20 PM	B53167
Toluene	ND	0.036		mg/Kg	1	8/2/2018 2:15:20 PM	B53167
Ethylbenzene	ND	0.036		mg/Kg	1	8/2/2018 2:15:20 PM	B53167
Xylenes, Total	ND	0.071		mg/Kg	1	8/2/2018 2:15:20 PM	B53167
Surr: 4-Bromofluorobenzene	121	70-130		%Rec	1	8/2/2018 2:15:20 PM	B53167
Surr: Toluene-d8	98.3	70-130		%Rec	1	8/2/2018 2:15:20 PM	B53167

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808105

03-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	LCS-39550		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 39550		RunNo: 53150					
Prep Date:	8/2/2018		Analysis Date: 8/2/2018		SeqNo: 1748858		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	90.8	70	130			
Surr: DNOP	4.4		5.000		88.6	50.6	138			

Sample ID	MB-39550	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID:	PBS	Batch ID: 39550		RunNo: 53150						
Prep Date:	8/2/2018	Analysis Date: 8/2/2018		SeqNo: 1748859		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.3		10.00		93.2	50.6	138			

Sample ID	LCS-39511		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 39511		RunNo: 53150					
Prep Date:	7/31/2018		Analysis Date: 8/2/2018		SeqNo: 1749788		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.5		5.000		89.1	50.6	138			

Sample ID	MB-39511		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 39511		RunNo: 53150					
Prep Date:	7/31/2018		Analysis Date: 8/2/2018		SeqNo: 1749790		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.7		10.00		97.0	50.6	138			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808105

03-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID 100ng btex lcs	SampType: LCS4			TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: BatchQC	Batch ID: B53167			RunNo: 53167						
Prep Date:	Analysis Date: 8/2/2018			SeqNo: 1749330		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	98.1	80	120			
Toluene	1.0	0.050	1.000	0	103	80	120			
Ethylbenzene	1.0	0.050	1.000	0	103	80	120			
Xylenes, Total	3.0	0.10	3.000	0	102	80	120			
Surr: 4-Bromofluorobenzene	0.49		0.5000		98.9	70	130			
Surr: Toluene-d8	0.49		0.5000		99.0	70	130			

Sample ID rb	SampType: MBLK			TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: PBS	Batch ID: B53167			RunNo: 53167						
Prep Date:	Analysis Date: 8/2/2018			SeqNo: 1749349		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.55		0.5000		111	70	130			
Surr: Toluene-d8	0.52		0.5000		104	70	130			

Sample ID 1808105-002ams	SampType: MS4			TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: SC-8	Batch ID: B53167			RunNo: 53167						
Prep Date:	Analysis Date: 8/2/2018			SeqNo: 1749917		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.73	0.020	0.7886	0.01064	90.9	80	120			
Toluene	0.76	0.039	0.7886	0.007247	95.6	80	120			
Ethylbenzene	0.78	0.039	0.7886	0.01228	97.8	82	121			
Xylenes, Total	2.5	0.079	2.366	0.05470	103	80.2	120			
Surr: 4-Bromofluorobenzene	0.42		0.3943		107	70	130			
Surr: Toluene-d8	0.38		0.3943		95.7	70	130			

Sample ID 1808105-002amsd	SampType: MSD4			TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: SC-8	Batch ID: B53167			RunNo: 53167						
Prep Date:	Analysis Date: 8/2/2018			SeqNo: 1749918		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.73	0.020	0.7886	0.01064	90.6	80	120	0.305	20	
Toluene	0.75	0.039	0.7886	0.007247	93.7	80	120	2.01	20	
Ethylbenzene	0.79	0.039	0.7886	0.01228	98.0	82	121	0.225	20	
Xylenes, Total	2.4	0.079	2.366	0.05470	101	80.2	120	1.87	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808105

03-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	1808105-002amsd	SampType:	MSD4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-8	Batch ID:	B53167	RunNo:	53167					
Prep Date:		Analysis Date:	8/2/2018	SeqNo:	1749918	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.44		0.3943		110	70	130	0	0	
Surr: Toluene-d8	0.38		0.3943		95.5	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808105

03-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS	Batch ID:	A53167	RunNo:	53167					
Prep Date:		Analysis Date:	8/2/2018	SeqNo:	1749301	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	109	70	130			
Surr: BFB	470		500.0		93.6	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS	Batch ID:	A53167	RunNo:	53167					
Prep Date:		Analysis Date:	8/2/2018	SeqNo:	1749302	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	500		500.0		99.1	70	130			

Sample ID	1808105-001ams	SampType:	MS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-3	Batch ID:	A53167	RunNo:	53167					
Prep Date:		Analysis Date:	8/2/2018	SeqNo:	1749913	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	140	19	92.59	36.44	107	64.7	142			
Surr: BFB	1900		1852		102	70	130			

Sample ID	1808105-001amsd	SampType:	MSD	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-3	Batch ID:	A53167	RunNo:	53167					
Prep Date:		Analysis Date:	8/2/2018	SeqNo:	1749914	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	120	19	92.59	36.44	94.1	64.7	142	9.26	20	
Surr: BFB	1900		1852		105	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1808105

RcptNo: 1

Received By: Anne Thorne 8/2/2018 8:37:00 AM

Completed By: Anne Thorne 8/2/2018 8:40:21 AM

Reviewed By: ENM 8/2/18

Labeled by: A-08/02/18 C0950

Anne Thorne

Anne Thorne

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.1	Good	Yes			
2	1.1	Good	Yes			

Chain-of-Custody Record

Client: Blue Engineering LLC

Mailing Address: 501 Airport Drive
Suite 205
Franklin, NM 87401
 Phone #: 505 743 7446
 email or Fax#: 505 743 7446

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☒ Rush Same Day

Project Name:
Lucerne #1

Project #:
4901

Project Manager:
Hunter Woods

Sampler: Justin Valdez
 On Ice: ☒ Yes ☐ No

Sample Temperature: 2-1-CF-10-1.1

Container Type and #
2 coolers
NEOTEX

Preservative Type
COB

HEAL No.
1808105

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
8/1/18	1003	Soil	SL-3	500000	Cold	1808105
8/1/18	1004		SL-3			202
8/1/18	1012		SL-4			203
8/1/18	1019		SL-17			204
8/1/18	1020		SL-18			205
8/1/18	1021		SL-19			206
8/1/18	1022		SL-20			207
8/1/18	1023		SL-21			208
8/1/18	1024		SL-22			209
8/1/18	1025		SL-23			210

Relinquished by: Justin Valdez Date: 8/1/18 Time: 1725

Relinquished by: Hunter Woods Date: 8/1/18 Time: 1817



**HALL ENVIRONMENTAL
ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TPB (Gas only)	X	BTEX + MTBE + TPB (8021)
TPH 8015B (GRO / DRO / MRO)	X	TPH (Method 418.1)
EDB (Method 504.1)		PAH's (8310 or 8270 SIMS)
RCRA 8 Metals		Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)
8081 Pesticides / 8082 PCB's		8260B (VOA)
8270 (Semi-VOA)		Air Bubbles (Y or N)

Remarks:
Direct Bill to Hilltop

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 07, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1808125

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 3 sample(s) on 8/2/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Removed by excavation -HW

Analytical Report

Lab Order 1808125

Date Reported: 8/7/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-11

Project: Lucerne 1

Collection Date: 8/1/2018 9:36:00 AM

Lab ID: 1808125-001

Matrix: SOIL

Received Date: 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	19	4.9		mg/Kg	1	8/3/2018 3:37:44 PM	39567
Surr: BFB	125	70-130		%Rec	1	8/3/2018 3:37:44 PM	39567
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	130	10		mg/Kg	1	8/3/2018 4:35:38 PM	39571
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/2018 4:35:38 PM	39571
Surr: DNOP	86.1	50.6-138		%Rec	1	8/3/2018 4:35:38 PM	39571
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.024		mg/Kg	1	8/3/2018 3:37:44 PM	39567
Toluene	ND	0.049		mg/Kg	1	8/3/2018 3:37:44 PM	39567
Ethylbenzene	ND	0.049		mg/Kg	1	8/3/2018 3:37:44 PM	39567
Xylenes, Total	ND	0.097		mg/Kg	1	8/3/2018 3:37:44 PM	39567
Surr: 4-Bromofluorobenzene	132	70-130	S	%Rec	1	8/3/2018 3:37:44 PM	39567
Surr: Toluene-d8	99.9	70-130		%Rec	1	8/3/2018 3:37:44 PM	39567

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank	Page 1 of 7
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified	

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808125**Date Reported: **8/7/2018****CLIENT:** Rule Engineering LLC**Client Sample ID:** SC-12**Project:** Lucerne 1**Collection Date:** 8/1/2018 9:31:00 AM**Lab ID:** 1808125-002**Matrix:** SOIL**Received Date:** 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/3/2018 5:10:54 PM	39567
Surr: BFB	113	70-130		%Rec	1	8/3/2018 5:10:54 PM	39567
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	16	9.8		mg/Kg	1	8/3/2018 4:57:43 PM	39571
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/3/2018 4:57:43 PM	39571
Surr: DNOP	88.7	50.6-138		%Rec	1	8/3/2018 4:57:43 PM	39571
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.025		mg/Kg	1	8/3/2018 5:10:54 PM	39567
Toluene	ND	0.049		mg/Kg	1	8/3/2018 5:10:54 PM	39567
Ethylbenzene	ND	0.049		mg/Kg	1	8/3/2018 5:10:54 PM	39567
Xylenes, Total	ND	0.098		mg/Kg	1	8/3/2018 5:10:54 PM	39567
Surr: 4-Bromofluorobenzene	127	70-130		%Rec	1	8/3/2018 5:10:54 PM	39567
Surr: Toluene-d8	96.8	70-130		%Rec	1	8/3/2018 5:10:54 PM	39567

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808125**Date Reported: **8/7/2018****CLIENT:** Rule Engineering LLC**Client Sample ID:** SC-13**Project:** Lucerne 1**Collection Date:** 8/1/2018 9:25:00 AM**Lab ID:** 1808125-003**Matrix:** SOIL**Received Date:** 8/2/2018 8:37:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/3/2018 5:57:29 PM	39567
Surr: BFB	117	70-130		%Rec	1	8/3/2018 5:57:29 PM	39567
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	10	10		mg/Kg	1	8/3/2018 5:19:49 PM	39571
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/2018 5:19:49 PM	39571
Surr: DNOP	88.3	50.6-138		%Rec	1	8/3/2018 5:19:49 PM	39571
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.024		mg/Kg	1	8/3/2018 5:57:29 PM	39567
Toluene	ND	0.047		mg/Kg	1	8/3/2018 5:57:29 PM	39567
Ethylbenzene	ND	0.047		mg/Kg	1	8/3/2018 5:57:29 PM	39567
Xylenes, Total	ND	0.095		mg/Kg	1	8/3/2018 5:57:29 PM	39567
Surr: 4-Bromofluorobenzene	131	70-130	S	%Rec	1	8/3/2018 5:57:29 PM	39567
Surr: Toluene-d8	96.0	70-130		%Rec	1	8/3/2018 5:57:29 PM	39567

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808125

07-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39571		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 39571		RunNo: 53193					
Prep Date:	8/2/2018		Analysis Date: 8/3/2018		SeqNo: 1750580		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.6		10.00		86.3	50.6	138			

Sample ID	LCS-39571		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 39571		RunNo: 53193					
Prep Date:	8/2/2018		Analysis Date: 8/3/2018		SeqNo: 1750710		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.00	0	102	70	130			
Surr: DNOP	4.2		5.000		83.7	50.6	138			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808125

07-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID 1808125-001ams	SampType: MS4		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: SC-11	Batch ID: 39567		RunNo: 53199							
Prep Date: 8/2/2018	Analysis Date: 8/3/2018		SeqNo: 1751100		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.024	0.9775	0	97.7	80	120			
Toluene	1.0	0.049	0.9775	0.007549	103	80	120			
Ethylbenzene	1.1	0.049	0.9775	0.01099	110	82	121			
Xylenes, Total	3.5	0.098	2.933	0.07489	115	80.2	120			
Surr: 4-Bromofluorobenzene	0.56		0.4888		114	70	130			
Surr: Toluene-d8	0.47		0.4888		95.5	70	130			

Sample ID 1808125-001amsd	SampType: MSD4		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: SC-11	Batch ID: 39567		RunNo: 53199							
Prep Date: 8/2/2018	Analysis Date: 8/3/2018		SeqNo: 1751101		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.024	0.9625	0	98.7	80	120	0.502	20	
Toluene	1.0	0.048	0.9625	0.007549	103	80	120	2.22	20	
Ethylbenzene	1.0	0.048	0.9625	0.01099	107	82	121	4.72	20	
Xylenes, Total	3.3	0.096	2.887	0.07489	111	80.2	120	5.18	20	
Surr: 4-Bromofluorobenzene	0.59		0.4812		123	70	130	0	0	
Surr: Toluene-d8	0.45		0.4812		93.5	70	130	0	0	

Sample ID lcs-39567	SampType: LCS4		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: BatchQC	Batch ID: 39567		RunNo: 53199							
Prep Date: 8/2/2018	Analysis Date: 8/3/2018		SeqNo: 1751160		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	92.9	80	120			
Toluene	0.94	0.050	1.000	0	94.2	80	120			
Ethylbenzene	0.94	0.050	1.000	0	94.1	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 4-Bromofluorobenzene	0.53		0.5000		107	70	130			
Surr: Toluene-d8	0.48		0.5000		95.4	70	130			

Sample ID mb-39567	SampType: MBLK		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: PBS	Batch ID: 39567		RunNo: 53199							
Prep Date: 8/2/2018	Analysis Date: 8/3/2018		SeqNo: 1751161		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808125

07-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	mb-39567	SampType:	MBLK	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	PBS	Batch ID:	39567	RunNo:	53199					
Prep Date:	8/2/2018	Analysis Date:	8/3/2018	SeqNo:	1751161	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.64		0.5000		128	70	130			
Surr: Toluene-d8	0.50		0.5000		99.1	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808125

07-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	lcs-39567		SampType: LCS		TestCode: EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS		Batch ID: 39567		RunNo: 53199					
Prep Date:	8/2/2018		Analysis Date: 8/3/2018		SeqNo: 1751079		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	98.6	70	130			
Surr: BFB	510		500.0		102	70	130			

Sample ID	mb-39567		SampType: MBLK		TestCode: EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS		Batch ID: 39567		RunNo: 53199					
Prep Date:	8/2/2018		Analysis Date: 8/3/2018		SeqNo: 1751080		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	570		500.0		114	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1808125

RcptNo: 1

Received By: Anne Thorne 8/2/2018 8:37:00 AM

Completed By: Anne Thorne 8/2/2018 10:33:46 AM

Reviewed By:

Labeled by: AT 08/02/18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

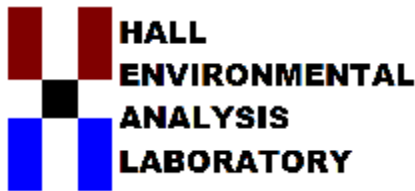
15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.1	Good	Yes			
2	1.1	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 13, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1808513

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 6 sample(s) on 8/9/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Removed by excavation -HW

Analytical Report

Lab Order 1808513

Date Reported: 8/13/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-11

Project: Lucerne 1

Collection Date: 8/8/2018 11:37:00 AM

Lab ID: 1808513-001

Matrix: SOIL

Received Date: 8/9/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	110	36		mg/Kg	10	8/9/2018 10:55:34 AM	A53327
Surr: BFB	112	70-130		%Rec	10	8/9/2018 10:55:34 AM	A53327
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	130	9.9		mg/Kg	1	8/9/2018 9:49:21 AM	39684
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/9/2018 9:49:21 AM	39684
Surr: DNOP	94.1	50.6-138		%Rec	1	8/9/2018 9:49:21 AM	39684
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.18		mg/Kg	10	8/9/2018 10:55:34 AM	B53327
Toluene	0.57	0.36		mg/Kg	10	8/9/2018 10:55:34 AM	B53327
Ethylbenzene	ND	0.36		mg/Kg	10	8/9/2018 10:55:34 AM	B53327
Xylenes, Total	3.7	0.72		mg/Kg	10	8/9/2018 10:55:34 AM	B53327
Surr: 4-Bromofluorobenzene	124	70-130		%Rec	10	8/9/2018 10:55:34 AM	B53327
Surr: Toluene-d8	99.4	70-130		%Rec	10	8/9/2018 10:55:34 AM	B53327

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1808513

Date Reported: 8/13/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-17

Project: Lucerne 1

Collection Date: 8/8/2018 11:24:00 AM

Lab ID: 1808513-002

Matrix: SOIL

Received Date: 8/9/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	30	20		mg/Kg	5	8/9/2018 11:18:43 AM	A53327
Surr: BFB	115	70-130		%Rec	5	8/9/2018 11:18:43 AM	A53327
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	76	9.8		mg/Kg	1	8/9/2018 10:11:35 AM	39684
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/9/2018 10:11:35 AM	39684
Surr: DNOP	95.9	50.6-138		%Rec	1	8/9/2018 10:11:35 AM	39684
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.098		mg/Kg	5	8/9/2018 11:18:43 AM	B53327
Toluene	ND	0.20		mg/Kg	5	8/9/2018 11:18:43 AM	B53327
Ethylbenzene	ND	0.20		mg/Kg	5	8/9/2018 11:18:43 AM	B53327
Xylenes, Total	ND	0.39		mg/Kg	5	8/9/2018 11:18:43 AM	B53327
Surr: 4-Bromofluorobenzene	128	70-130		%Rec	5	8/9/2018 11:18:43 AM	B53327
Surr: Toluene-d8	98.7	70-130		%Rec	5	8/9/2018 11:18:43 AM	B53327

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808513**Date Reported: **8/13/2018****CLIENT:** Rule Engineering LLC**Client Sample ID:** SC-18**Project:** Lucerne 1**Collection Date:** 8/8/2018 11:30:00 AM**Lab ID:** 1808513-003**Matrix:** SOIL**Received Date:** 8/9/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.4		mg/Kg	1	8/9/2018 11:41:48 AM	A53327
Surr: BFB	112	70-130		%Rec	1	8/9/2018 11:41:48 AM	A53327
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/9/2018 10:33:38 AM	39684
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/9/2018 10:33:38 AM	39684
Surr: DNOP	92.0	50.6-138		%Rec	1	8/9/2018 10:33:38 AM	39684
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.017		mg/Kg	1	8/9/2018 11:41:48 AM	B53327
Toluene	ND	0.034		mg/Kg	1	8/9/2018 11:41:48 AM	B53327
Ethylbenzene	0.051	0.034		mg/Kg	1	8/9/2018 11:41:48 AM	B53327
Xylenes, Total	0.25	0.068		mg/Kg	1	8/9/2018 11:41:48 AM	B53327
Surr: 4-Bromofluorobenzene	125	70-130		%Rec	1	8/9/2018 11:41:48 AM	B53327
Surr: Toluene-d8	95.1	70-130		%Rec	1	8/9/2018 11:41:48 AM	B53327

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808513**

Date Reported: **8/13/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-20

Project: Lucerne 1

Collection Date: 8/8/2018 11:02:00 AM

Lab ID: 1808513-004

Matrix: SOIL

Received Date: 8/9/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	8/9/2018 12:04:58 PM	A53327
Surr: BFB	116	70-130		%Rec	1	8/9/2018 12:04:58 PM	A53327
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/9/2018 10:55:47 AM	39684
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/9/2018 10:55:47 AM	39684
Surr: DNOP	92.9	50.6-138		%Rec	1	8/9/2018 10:55:47 AM	39684
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	0.021	0.019		mg/Kg	1	8/9/2018 12:04:58 PM	B53327
Toluene	ND	0.038		mg/Kg	1	8/9/2018 12:04:58 PM	B53327
Ethylbenzene	ND	0.038		mg/Kg	1	8/9/2018 12:04:58 PM	B53327
Xylenes, Total	ND	0.075		mg/Kg	1	8/9/2018 12:04:58 PM	B53327
Surr: 4-Bromofluorobenzene	131	70-130	S	%Rec	1	8/9/2018 12:04:58 PM	B53327
Surr: Toluene-d8	98.3	70-130		%Rec	1	8/9/2018 12:04:58 PM	B53327

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1808513

Date Reported: 8/13/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-25

Project: Lucerne 1

Collection Date: 8/8/2018 12:10:00 PM

Lab ID: 1808513-005

Matrix: SOIL

Received Date: 8/9/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	60	18		mg/Kg	5	8/9/2018 12:28:03 PM	A53327
Surr: BFB	116	70-130		%Rec	5	8/9/2018 12:28:03 PM	A53327
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	59	9.9		mg/Kg	1	8/9/2018 11:17:49 AM	39684
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/9/2018 11:17:49 AM	39684
Surr: DNOP	99.7	50.6-138		%Rec	1	8/9/2018 11:17:49 AM	39684
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.092		mg/Kg	5	8/9/2018 12:28:03 PM	B53327
Toluene	ND	0.18		mg/Kg	5	8/9/2018 12:28:03 PM	B53327
Ethylbenzene	ND	0.18		mg/Kg	5	8/9/2018 12:28:03 PM	B53327
Xylenes, Total	0.46	0.37		mg/Kg	5	8/9/2018 12:28:03 PM	B53327
Surr: 4-Bromofluorobenzene	129	70-130		%Rec	5	8/9/2018 12:28:03 PM	B53327
Surr: Toluene-d8	96.8	70-130		%Rec	5	8/9/2018 12:28:03 PM	B53327

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808513**Date Reported: **8/13/2018****CLIENT:** Rule Engineering LLC**Client Sample ID:** SC-24**Project:** Lucerne 1**Collection Date:** 8/8/2018 11:15:00 AM**Lab ID:** 1808513-006**Matrix:** SOIL**Received Date:** 8/9/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	18		mg/Kg	5	8/9/2018 12:51:13 PM	A53327
Surr: BFB	104	70-130		%Rec	5	8/9/2018 12:51:13 PM	A53327
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/9/2018 11:40:01 AM	39684
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/9/2018 11:40:01 AM	39684
Surr: DNOP	95.9	50.6-138		%Rec	1	8/9/2018 11:40:01 AM	39684
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.090		mg/Kg	5	8/9/2018 12:51:13 PM	B53327
Toluene	ND	0.18		mg/Kg	5	8/9/2018 12:51:13 PM	B53327
Ethylbenzene	ND	0.18		mg/Kg	5	8/9/2018 12:51:13 PM	B53327
Xylenes, Total	ND	0.36		mg/Kg	5	8/9/2018 12:51:13 PM	B53327
Surr: 4-Bromofluorobenzene	116	70-130		%Rec	5	8/9/2018 12:51:13 PM	B53327
Surr: Toluene-d8	97.8	70-130		%Rec	5	8/9/2018 12:51:13 PM	B53327

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808513

13-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39684		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 39684		RunNo: 53283					
Prep Date:	8/9/2018		Analysis Date: 8/9/2018		SeqNo: 1755103		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.4		10.00		84.2	50.6	138			

Sample ID	LCS-39684		SampType:	LCS		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	LCSS		Batch ID:	39684		RunNo:	53283				
Prep Date:	8/9/2018		Analysis Date:	8/9/2018		SeqNo:	1755104		Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	47	10	50.00	0	94.0	70	130				
Surr: DNOP	4.3		5.000		85.6	50.6	138				

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808513

13-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	100ng lcs	SampType:	LCS4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	BatchQC	Batch ID:	B53327	RunNo:	53327					
Prep Date:		Analysis Date:	8/9/2018	SeqNo:	1755662	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.92	0.050	1.000	0	91.6	80	120			
Benzene	0.96	0.025	1.000	0	96.0	80	120			
Toluene	0.99	0.050	1.000	0	99.3	80	120			
Ethylbenzene	0.99	0.050	1.000	0	99.2	80	120			
Xylenes, Total	2.9	0.10	3.000	0	98.3	80	120			
Surr: 4-Bromofluorobenzene	0.54		0.5000		107	70	130			
Surr: Toluene-d8	0.50		0.5000		99.3	70	130			

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	PBS	Batch ID:	B53327	RunNo:	53327					
Prep Date:		Analysis Date:	8/9/2018	SeqNo:	1755674	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.050								
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.59		0.5000		117	70	130			
Surr: Toluene-d8	0.50		0.5000		101	70	130			

Sample ID	1808513-002ams	SampType:	MS4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-17	Batch ID:	B53327	RunNo:	53327					
Prep Date:		Analysis Date:	8/9/2018	SeqNo:	1756108	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	3.7	0.20	3.934	0	94.4	80	120			
Benzene	3.7	0.098	3.934	0	93.0	80	120			
Toluene	3.8	0.20	3.934	0.03289	96.2	80	120			
Ethylbenzene	4.1	0.20	3.934	0.04520	102	82	121			
Xylenes, Total	12	0.39	11.80	0.3783	100	80.2	120			
Surr: 4-Bromofluorobenzene	2.3		1.967		116	70	130			
Surr: Toluene-d8	2.0		1.967		101	70	130			

Sample ID	1808513-002amsd	SampType:	MSD4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-17	Batch ID:	B53327	RunNo:	53327					
Prep Date:		Analysis Date:	8/9/2018	SeqNo:	1756109	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	3.7	0.20	3.934	0	93.7	80	120	0.763	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808513

13-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	1808513-002amsd		SampType: MSD4		TestCode: EPA Method 8260B: Volatiles Short List					
Client ID:	SC-17		Batch ID: B53327		RunNo: 53327					
Prep Date:			Analysis Date: 8/9/2018		SeqNo: 1756109		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3.6	0.098	3.934	0	91.8	80	120	1.29	20	
Toluene	3.7	0.20	3.934	0.03289	93.3	80	120	3.05	20	
Ethylbenzene	3.8	0.20	3.934	0.04520	95.6	82	121	6.56	20	
Xylenes, Total	12	0.39	11.80	0.3783	97.4	80.2	120	2.96	20	
Surr: 4-Bromofluorobenzene	2.2		1.967		112	70	130	0	0	
Surr: Toluene-d8	2.0		1.967		99.2	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808513

13-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS	Batch ID:	A53327	RunNo:	53327					
Prep Date:		Analysis Date:	8/9/2018	SeqNo:	1755649	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	105	70	130			
Surr: BFB	490		500.0		97.6	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS	Batch ID:	A53327	RunNo:	53327					
Prep Date:		Analysis Date:	8/9/2018	SeqNo:	1755650	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	520		500.0		105	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: **RULE ENGINEERING LL**

Work Order Number: **1808513**

RcptNo: **1**

Received By: **Anne Thorne**

8/9/2018 6:50:00 AM

Anne Thorne

Completed By: **Anne Thorne**

8/9/2018 6:56:08 AM

Anne Thorne

Reviewed By:

IO

8/9/18

Labeled by: 8/9/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐

2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐

4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐

5. Sample(s) in proper container(s)? Yes ☒ No ☐

6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐

7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐

8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐

9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒

10. Were any sample containers received broken? Yes ☐ No ☒

11. Does paperwork match bottle labels? Yes ☒ No ☐

(Note discrepancies on chain of custody)

12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐

13. Is it clear what analyses were requested? Yes ☒ No ☐

14. Were all holding times able to be met? Yes ☒ No ☐

(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date:

By Whom:

Via:

☐ eMail

☐ Phone

☐ Fax

☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
3	1.0	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 14, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HEC Lucerne 1

OrderNo.: 1808720

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 7 sample(s) on 8/11/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808720**

Date Reported: **8/14/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-3 (R)

Project: HEC Lucerne 1

Collection Date: 8/10/2018 2:27:00 PM

Lab ID: 1808720-001

Matrix: SOIL

Received Date: 8/11/2018 10:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	17		mg/Kg	5	8/13/2018 11:03:12 AM	A53389
Surr: BFB	104	70-130		%Rec	5	8/13/2018 11:03:12 AM	A53389
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/13/2018 11:20:40 AM	39736
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/13/2018 11:20:40 AM	39736
Surr: DNOP	91.6	50.6-138		%Rec	1	8/13/2018 11:20:40 AM	39736
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.085		mg/Kg	5	8/13/2018 11:03:12 AM	C53389
Toluene	ND	0.17		mg/Kg	5	8/13/2018 11:03:12 AM	C53389
Ethylbenzene	ND	0.17		mg/Kg	5	8/13/2018 11:03:12 AM	C53389
Xylenes, Total	ND	0.34		mg/Kg	5	8/13/2018 11:03:12 AM	C53389
Surr: 4-Bromofluorobenzene	118	70-130		%Rec	5	8/13/2018 11:03:12 AM	C53389
Surr: Toluene-d8	97.5	70-130		%Rec	5	8/13/2018 11:03:12 AM	C53389

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808720**

Date Reported: **8/14/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-11 (R)

Project: HEC Lucerne 1

Collection Date: 8/10/2018 2:16:00 PM

Lab ID: 1808720-002

Matrix: SOIL

Received Date: 8/11/2018 10:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	22	3.6		mg/Kg	1	8/13/2018 11:26:18 AM	A53389
Surr: BFB	116	70-130		%Rec	1	8/13/2018 11:26:18 AM	A53389
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	20	9.8		mg/Kg	1	8/13/2018 11:42:39 AM	39736
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/13/2018 11:42:39 AM	39736
Surr: DNOP	82.7	50.6-138		%Rec	1	8/13/2018 11:42:39 AM	39736
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	0.052	0.018		mg/Kg	1	8/13/2018 11:26:18 AM	C53389
Toluene	0.30	0.036		mg/Kg	1	8/13/2018 11:26:18 AM	C53389
Ethylbenzene	0.079	0.036		mg/Kg	1	8/13/2018 11:26:18 AM	C53389
Xylenes, Total	0.89	0.073		mg/Kg	1	8/13/2018 11:26:18 AM	C53389
Surr: 4-Bromofluorobenzene	132	70-130	S	%Rec	1	8/13/2018 11:26:18 AM	C53389
Surr: Toluene-d8	97.5	70-130		%Rec	1	8/13/2018 11:26:18 AM	C53389

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1808720

Date Reported: 8/14/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-17 (R)

Project: HEC Lucerne 1

Collection Date: 8/10/2018 2:03:00 PM

Lab ID: 1808720-003

Matrix: SOIL

Received Date: 8/11/2018 10:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	28	17		mg/Kg	5	8/13/2018 11:49:23 AM	A53389
Surr: BFB	110	70-130		%Rec	5	8/13/2018 11:49:23 AM	A53389
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	77	9.5		mg/Kg	1	8/13/2018 12:04:40 PM	39736
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/13/2018 12:04:40 PM	39736
Surr: DNOP	85.7	50.6-138		%Rec	1	8/13/2018 12:04:40 PM	39736
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.086		mg/Kg	5	8/13/2018 11:49:23 AM	C53389
Toluene	ND	0.17		mg/Kg	5	8/13/2018 11:49:23 AM	C53389
Ethylbenzene	ND	0.17		mg/Kg	5	8/13/2018 11:49:23 AM	C53389
Xylenes, Total	ND	0.34		mg/Kg	5	8/13/2018 11:49:23 AM	C53389
Surr: 4-Bromofluorobenzene	125	70-130		%Rec	5	8/13/2018 11:49:23 AM	C53389
Surr: Toluene-d8	101	70-130		%Rec	5	8/13/2018 11:49:23 AM	C53389

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1808720**

Date Reported: **8/14/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-25 (R)

Project: HEC Lucerne 1

Collection Date: 8/10/2018 2:09:00 PM

Lab ID: 1808720-004

Matrix: SOIL

Received Date: 8/11/2018 10:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.3		mg/Kg	1	8/13/2018 12:12:32 PM	A53389
Surr: BFB	110	70-130		%Rec	1	8/13/2018 12:12:32 PM	A53389
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/13/2018 12:26:39 PM	39736
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/13/2018 12:26:39 PM	39736
Surr: DNOP	75.9	50.6-138		%Rec	1	8/13/2018 12:26:39 PM	39736
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	0.030	0.017		mg/Kg	1	8/13/2018 12:12:32 PM	C53389
Toluene	0.14	0.033		mg/Kg	1	8/13/2018 12:12:32 PM	C53389
Ethylbenzene	ND	0.033		mg/Kg	1	8/13/2018 12:12:32 PM	C53389
Xylenes, Total	0.11	0.066		mg/Kg	1	8/13/2018 12:12:32 PM	C53389
Surr: 4-Bromofluorobenzene	125	70-130		%Rec	1	8/13/2018 12:12:32 PM	C53389
Surr: Toluene-d8	95.3	70-130		%Rec	1	8/13/2018 12:12:32 PM	C53389

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SP-4

Project: HEC Lucerne 1

Collection Date: 8/10/2018 8:30:00 AM

Lab ID: 1808720-005

Matrix: SOIL

Received Date: 8/11/2018 10:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	4.1	3.5		mg/Kg	1	8/13/2018 12:35:39 PM	A53389
Surr: BFB	120	70-130		%Rec	1	8/13/2018 12:35:39 PM	A53389
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	37	9.5		mg/Kg	1	8/13/2018 11:24:24 AM	39736
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/13/2018 11:24:24 AM	39736
Surr: DNOP	99.1	50.6-138		%Rec	1	8/13/2018 11:24:24 AM	39736
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.018		mg/Kg	1	8/13/2018 12:35:39 PM	C53389
Toluene	ND	0.035		mg/Kg	1	8/13/2018 12:35:39 PM	C53389
Ethylbenzene	ND	0.035		mg/Kg	1	8/13/2018 12:35:39 PM	C53389
Xylenes, Total	ND	0.071		mg/Kg	1	8/13/2018 12:35:39 PM	C53389
Surr: 4-Bromofluorobenzene	136	70-130	S	%Rec	1	8/13/2018 12:35:39 PM	C53389
Surr: Toluene-d8	94.3	70-130		%Rec	1	8/13/2018 12:35:39 PM	C53389

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SP-8

Project: HEC Lucerne 1

Collection Date: 8/10/2018 8:35:00 AM

Lab ID: 1808720-006

Matrix: SOIL

Received Date: 8/11/2018 10:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	4.6	3.5		mg/Kg	1	8/13/2018 12:58:43 PM	A53389
Surr: BFB	120	70-130		%Rec	1	8/13/2018 12:58:43 PM	A53389
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	32	9.3		mg/Kg	1	8/13/2018 10:59:59 AM	39736
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/13/2018 10:59:59 AM	39736
Surr: DNOP	96.0	50.6-138		%Rec	1	8/13/2018 10:59:59 AM	39736
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.018		mg/Kg	1	8/13/2018 12:58:43 PM	C53389
Toluene	ND	0.035		mg/Kg	1	8/13/2018 12:58:43 PM	C53389
Ethylbenzene	ND	0.035		mg/Kg	1	8/13/2018 12:58:43 PM	C53389
Xylenes, Total	ND	0.071		mg/Kg	1	8/13/2018 12:58:43 PM	C53389
Surr: 4-Bromofluorobenzene	129	70-130		%Rec	1	8/13/2018 12:58:43 PM	C53389
Surr: Toluene-d8	97.5	70-130		%Rec	1	8/13/2018 12:58:43 PM	C53389

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1808720

Date Reported: 8/14/2018

CLIENT: Rule Engineering LLC

Client Sample ID: Island

Project: HEC Lucerne 1

Collection Date: 8/10/2018 2:45:00 PM

Lab ID: 1808720-007

Matrix: SOIL

Received Date: 8/11/2018 10:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	8/13/2018 1:21:52 PM	A53389
Surr: BFB	114	70-130		%Rec	1	8/13/2018 1:21:52 PM	A53389
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	29	9.5		mg/Kg	1	8/13/2018 10:35:37 AM	39736
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/13/2018 10:35:37 AM	39736
Surr: DNOP	92.0	50.6-138		%Rec	1	8/13/2018 10:35:37 AM	39736
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.019		mg/Kg	1	8/13/2018 1:21:52 PM	C53389
Toluene	ND	0.037		mg/Kg	1	8/13/2018 1:21:52 PM	C53389
Ethylbenzene	ND	0.037		mg/Kg	1	8/13/2018 1:21:52 PM	C53389
Xylenes, Total	ND	0.075		mg/Kg	1	8/13/2018 1:21:52 PM	C53389
Surr: 4-Bromofluorobenzene	129	70-130		%Rec	1	8/13/2018 1:21:52 PM	C53389
Surr: Toluene-d8	95.5	70-130		%Rec	1	8/13/2018 1:21:52 PM	C53389

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808720

14-Aug-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	MB-39736	SampType: MBLK			TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS	Batch ID: 39736			RunNo: 53383					
Prep Date:	8/13/2018	Analysis Date: 8/13/2018			SeqNo: 1758231		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	6.5		10.00		65.4	50.6	138			

Sample ID	LCS-39736		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 39736		RunNo: 53383					
Prep Date:	8/13/2018		Analysis Date: 8/13/2018		SeqNo: 1758232		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	90.3	70	130			
Surr: DNOP	3.3		5.000		66.5	50.6	138			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808720

14-Aug-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	100ng lcs	SampType:	LCS4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	BatchQC	Batch ID:	C53389	RunNo:	53389					
Prep Date:		Analysis Date:	8/13/2018	SeqNo:	1758221	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	102	80	120			
Toluene	1.1	0.050	1.000	0	108	80	120			
Ethylbenzene	1.1	0.050	1.000	0	110	80	120			
Xylenes, Total	3.2	0.10	3.000	0	106	80	120			
Surr: 4-Bromofluorobenzene	0.51		0.5000		103	70	130			
Surr: Toluene-d8	0.49		0.5000		97.5	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	PBS	Batch ID:	C53389	RunNo:	53389					
Prep Date:		Analysis Date:	8/13/2018	SeqNo:	1758230	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.59		0.5000		118	70	130			
Surr: Toluene-d8	0.50		0.5000		99.9	70	130			

Sample ID	1808720-001AMS	SampType:	MS4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-3 (R)	Batch ID:	C53389	RunNo:	53389					
Prep Date:		Analysis Date:	8/13/2018	SeqNo:	1759042	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3.4	0.085	3.385	0	100	80	120			
Toluene	3.6	0.17	3.385	0	107	80	120			
Ethylbenzene	3.7	0.17	3.385	0.02908	107	82	121			
Xylenes, Total	11	0.34	10.16	0.08222	107	80.2	120			
Surr: 4-Bromofluorobenzene	1.9		1.693		111	70	130			
Surr: Toluene-d8	1.7		1.693		102	70	130			

Sample ID	1808720-001AMSD	SampType:	MSD4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-3 (R)	Batch ID:	C53389	RunNo:	53389					
Prep Date:		Analysis Date:	8/13/2018	SeqNo:	1759043	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3.2	0.085	3.385	0	94.6	80	120	5.82	20	
Toluene	3.4	0.17	3.385	0	100	80	120	6.88	20	
Ethylbenzene	3.5	0.17	3.385	0.02908	102	82	121	5.22	20	
Xylenes, Total	10	0.34	10.16	0.08222	101	80.2	120	5.09	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808720

14-Aug-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	1808720-001AMSD		SampType:	MSD4		TestCode:	EPA Method 8260B: Volatiles Short List				
Client ID:	SC-3 (R)		Batch ID:	C53389		RunNo:	53389				
Prep Date:			Analysis Date:	8/13/2018		SeqNo:	1759043		Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Surr: 4-Bromofluorobenzene	1.8		1.693		107	70	130	0	0		
Surr: Toluene-d8	1.6		1.693		96.7	70	130	0	0		

Sample ID	lcs-39720		SampType: LCS4		TestCode: EPA Method 8260B: Volatiles Short List					
Client ID:	BatchQC		Batch ID: 39720		RunNo: 53389					
Prep Date:	8/10/2018		Analysis Date: 8/13/2018		SeqNo: 1759044		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.56		0.5000		113	70	130			
Surr: Toluene-d8	0.48		0.5000		95.2	70	130			

Sample ID	lcs-39723		SampType: LCS4		TestCode: EPA Method 8260B: Volatiles Short List					
Client ID:	BatchQC		Batch ID: 39723		RunNo: 53389					
Prep Date:	8/10/2018		Analysis Date: 8/13/2018		SeqNo: 1759045		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.58		0.5000		116	70	130			
Surr: Toluene-d8	0.45		0.5000		90.7	70	130			

Sample ID	mb-39720		SampType:	MBLK		TestCode:	EPA Method 8260B: Volatiles Short List				
Client ID:	PBS		Batch ID:	39720		RunNo:	53389				
Prep Date:	8/10/2018		Analysis Date:	8/13/2018		SeqNo:	1759046		Units: %Rec		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Surr: 4-Bromofluorobenzene	0.64		0.5000		128	70	130				
Surr: Toluene-d8	0.48		0.5000		95.1	70	130				

Sample ID	mb-39723		SampType: MBLK		TestCode: EPA Method 8260B: Volatiles Short List					
Client ID:	PBS		Batch ID: 39723		RunNo: 53389					
Prep Date:	8/10/2018		Analysis Date: 8/13/2018		SeqNo: 1759047		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.64		0.5000		128	70	130			
Surr: Toluene-d8	0.48		0.5000		95.6	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808720

14-Aug-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS	Batch ID:	A53389	RunNo:	53389					
Prep Date:		Analysis Date:	8/13/2018	SeqNo:	1758218	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	104	70	130			
Surr: BFB	480		500.0		95.5	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS	Batch ID:	A53389	RunNo:	53389					
Prep Date:		Analysis Date:	8/13/2018	SeqNo:	1758219	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	530		500.0		105	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1808720

RcptNo: 1

Received By: Isaiah Ortiz

8/11/2018 10:30:00 AM

IO

Completed By: Anne Thorne

8/13/2018 7:34:48 AM

Am Th

Reviewed By: *LB*

8/13/18

Label By: AT 8/13/18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

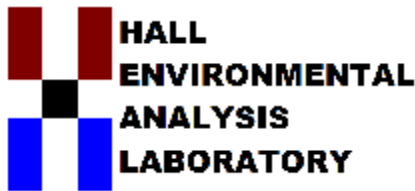
15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.1	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 24, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1808E15

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 1 sample(s) on 8/23/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1808E15

Date Reported: 8/24/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-17

Project: Lucerne 1

Collection Date: 8/22/2018 9:11:00 AM

Lab ID: 1808E15-001

Matrix: SOIL

Received Date: 8/23/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	8/23/2018 10:27:33 AM	B53667
Surr: BFB	110	70-130		%Rec	1	8/23/2018 10:27:33 AM	B53667
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	11	9.9		mg/Kg	1	8/23/2018 10:07:45 AM	39950
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/23/2018 10:07:45 AM	39950
Surr: DNOP	112	50.6-138		%Rec	1	8/23/2018 10:07:45 AM	39950
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.019		mg/Kg	1	8/23/2018 10:27:33 AM	A53667
Toluene	ND	0.038		mg/Kg	1	8/23/2018 10:27:33 AM	A53667
Ethylbenzene	ND	0.038		mg/Kg	1	8/23/2018 10:27:33 AM	A53667
Xylenes, Total	ND	0.075		mg/Kg	1	8/23/2018 10:27:33 AM	A53667
Surr: 4-Bromofluorobenzene	123	70-130		%Rec	1	8/23/2018 10:27:33 AM	A53667
Surr: Toluene-d8	98.1	70-130		%Rec	1	8/23/2018 10:27:33 AM	A53667

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808E15

24-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39950		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 39950		RunNo: 53643					
Prep Date:	8/23/2018		Analysis Date: 8/23/2018		SeqNo: 1769069		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		102	50.6	138			

Sample ID	LCS-39950		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 39950		RunNo: 53643					
Prep Date:	8/23/2018		Analysis Date: 8/23/2018		SeqNo: 1769181		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	93.3	70	130			
Surr: DNOP	4.9		5.000		97.5	50.6	138			

Sample ID	1808E15-001AMS		SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-17		Batch ID: 39950		RunNo: 53643					
Prep Date:	8/23/2018		Analysis Date: 8/23/2018		SeqNo: 1769449		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	9.8	49.21	10.61	86.8	53.5	126			
Surr: DNOP	5.1		4.921		103	50.6	138			

Sample ID	1808E15-001AMSD		SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-17		Batch ID: 39950		RunNo: 53643					
Prep Date:	8/23/2018		Analysis Date: 8/23/2018		SeqNo: 1769450		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	55	9.7	48.64	10.61	90.9	53.5	126	2.79	21.7	
Surr: DNOP	5.2		4.864		107	50.6	138	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808E15

24-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	100ng lcs	SampType:	LCS4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	BatchQC	Batch ID:	A53667	RunNo:	53667					
Prep Date:		Analysis Date:	8/23/2018	SeqNo:	1769874	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	105	80	120			
Toluene	1.1	0.050	1.000	0	109	80	120			
Ethylbenzene	1.1	0.050	1.000	0	110	80	120			
Xylenes, Total	3.2	0.10	3.000	0	107	80	120			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			
Surr: Toluene-d8	0.53		0.5000		105	70	130			

Sample ID	1808e15-001ams	SampType: MS4		TestCode: EPA Method 8260B: Volatiles Short List						
Client ID:	SC-17	Batch ID: A53667		RunNo: 53667						
Prep Date:	Analysis Date: 8/23/2018		SeqNo: 1769876		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.74	0.019	0.7502	0	98.0	80	120			
Toluene	0.78	0.038	0.7502	0.004674	104	80	120			
Ethylbenzene	0.80	0.038	0.7502	0.006144	106	82	121			
Xylenes, Total	2.5	0.075	2.251	0.03467	109	80.2	120			
Surr: 4-Bromofluorobenzene	0.43		0.3751		115	70	130			
Surr: Toluene-d8	0.37		0.3751		98.0	70	130			

Sample ID	1808e15-001amsd		SampType: MSD4		TestCode: EPA Method 8260B: Volatiles Short List					
Client ID:	SC-17		Batch ID: A53667		RunNo: 53667					
Prep Date:			Analysis Date: 8/23/2018		SeqNo: 1769877		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.71	0.019	0.7502	0	94.9	80	120	3.25	20	
Toluene	0.77	0.038	0.7502	0.004674	102	80	120	1.98	20	
Ethylbenzene	0.81	0.038	0.7502	0.006144	107	82	121	1.02	20	
Xylenes, Total	2.4	0.075	2.251	0.03467	107	80.2	120	1.51	20	
Surr: 4-Bromofluorobenzene	0.44		0.3751		118	70	130	0	0	
Surr: Toluene-d8	0.36		0.3751		96.0	70	130	0	0	

Sample ID	rb	SampType: MBLK			TestCode: EPA Method 8260B: Volatiles Short List					
Client ID:	PBS	Batch ID: A53667			RunNo: 53667					
Prep Date:		Analysis Date: 8/23/2018			SeqNo: 1769878		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808E15

24-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	PBS	Batch ID:	A53667	RunNo:	53667					
Prep Date:		Analysis Date:	8/23/2018	SeqNo:	1769878	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.56		0.5000		113	70	130			
Surr: Toluene-d8	0.51		0.5000		102	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808E15

24-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	1808e15-001ams	SampType:	MS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-17	Batch ID:	B53667	RunNo:	53667					
Prep Date:		Analysis Date:	8/23/2018	SeqNo:	1769869	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	3.8	18.76	1.973	97.5	64.7	142			
Surr: BFB	400		375.1		105	70	130			

Sample ID	1808e15-001amsd	SampType:	MSD	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-17	Batch ID:	B53667	RunNo:	53667					
Prep Date:		Analysis Date:	8/23/2018	SeqNo:	1769870	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	3.8	18.76	1.973	96.7	64.7	142	0.706	20	
Surr: BFB	410		375.1		109	70	130	0	0	

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS	Batch ID:	B53667	RunNo:	53667					
Prep Date:		Analysis Date:	8/23/2018	SeqNo:	1769871	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	102	70	130			
Surr: BFB	480		500.0		95.5	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS	Batch ID:	B53667	RunNo:	53667					
Prep Date:		Analysis Date:	8/23/2018	SeqNo:	1769872	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	500		500.0		100	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1808E15

RcptNo: 1

Received By: Anne Thorne 8/23/2018 7:00:00 AM

Completed By: Anne Thorne 8/23/2018 7:17:45 AM

Reviewed By: AL 8/23/18

Labeled by AT 8/23/18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.3	Good	Yes			
2	1.0	Good	Yes			

Chain-of-Custody Record

Client: Paul Engineering, LLC

Mailing Address: 501 Almont Dr Suite

105 Washington, NM 87101

Phone #: 505 793 9480

email or Fax#: justinvaldez@pauleng.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Date Time Matrix Sample Request ID

8/24/18 911 Soil SC-17

Date: 8/24/18 1114

Date: 8/24/18 1837

Relinquished by: Justin Valdez

Relinquished by: Madeline Waack

Turn-Around Time:

☐ Standard ☒ Rush Some Day

Project Name: Luernne #1

Project #: Project Manager: Heather Woods

Sampler: Justin Valdez

On Ice: ☒ Yes ☐ No

Sample Temperature: 22.00°C 5.3-6.1°C

Container Type and # 1000 #1

Preservative Type HEAL No.

HEAL No. 1808 EIS

702

4oz Glass Cold

BTEX + MTBE + TPH (Gas only)

BTEX + MTBE + TPH (Gas only)

TPH 8015B (GRO / DRO / MRO)

TPH (Method 418.1)

EDB (Method 504.1)

PAH's (8310 or 8270 SIMS)

RCRA 8 Metals

Anions (F⁻, Cl⁻, NO₃⁻, NO₂⁻, PO₄³⁻, SO₄²⁻)

8081 Pesticides / 8082 PCB's

8260B (VOA)

8270 (Semi-VOA)

Air Bubbles (Y or N)

Remarks: Direct Bill to Hillcorp

Received by: Justin Waack 8/22/18 1114

Received by: Madeline Waack 08/23/18 0700

HALL ENVIRONMENTAL ANALYSIS LABORATORY

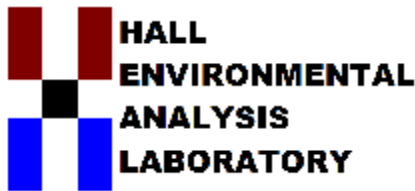
www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 29, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Lucerne 1

OrderNo.: 1808E48

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 4 sample(s) on 8/23/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1808E48

Date Reported: 8/29/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-26

Project: Lucerne 1

Collection Date: 8/22/2018 9:17:00 AM

Lab ID: 1808E48-001

Matrix: SOIL

Received Date: 8/23/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	11	9.9		mg/Kg	1	8/27/2018 8:34:47 PM	39983
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/27/2018 8:34:47 PM	39983
Surr: DNOP	124	50.6-138		%Rec	1	8/27/2018 8:34:47 PM	39983
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/27/2018 5:04:57 PM	39981
Surr: BFB	97.3	15-316		%Rec	1	8/27/2018 5:04:57 PM	39981
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.053	0.024		mg/Kg	1	8/27/2018 5:04:57 PM	39981
Toluene	0.18	0.048		mg/Kg	1	8/27/2018 5:04:57 PM	39981
Ethylbenzene	ND	0.048		mg/Kg	1	8/27/2018 5:04:57 PM	39981
Xylenes, Total	0.35	0.096		mg/Kg	1	8/27/2018 5:04:57 PM	39981
Surr: 4-Bromofluorobenzene	95.8	80-120		%Rec	1	8/27/2018 5:04:57 PM	39981

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1808E48

Date Reported: 8/29/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-27

Project: Lucerne 1

Collection Date: 8/22/2018 9:23:00 AM

Lab ID: 1808E48-002

Matrix: SOIL

Received Date: 8/23/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	8/27/2018 8:56:49 PM	39983
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/27/2018 8:56:49 PM	39983
Surr: DNOP	115	50.6-138		%Rec	1	8/27/2018 8:56:49 PM	39983
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/27/2018 5:28:25 PM	39981
Surr: BFB	95.1	15-316		%Rec	1	8/27/2018 5:28:25 PM	39981
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	8/27/2018 5:28:25 PM	39981
Toluene	0.082	0.050		mg/Kg	1	8/27/2018 5:28:25 PM	39981
Ethylbenzene	ND	0.050		mg/Kg	1	8/27/2018 5:28:25 PM	39981
Xylenes, Total	0.11	0.10		mg/Kg	1	8/27/2018 5:28:25 PM	39981
Surr: 4-Bromofluorobenzene	95.2	80-120		%Rec	1	8/27/2018 5:28:25 PM	39981

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1808E48

Date Reported: 8/29/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-28

Project: Lucerne 1

Collection Date: 8/22/2018 9:30:00 AM

Lab ID: 1808E48-003

Matrix: SOIL

Received Date: 8/23/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/27/2018 9:18:50 PM	39983
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/27/2018 9:18:50 PM	39983
Surr: DNOP	112	50.6-138		%Rec	1	8/27/2018 9:18:50 PM	39983
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/27/2018 5:51:53 PM	39981
Surr: BFB	94.5	15-316		%Rec	1	8/27/2018 5:51:53 PM	39981
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	8/27/2018 5:51:53 PM	39981
Toluene	ND	0.046		mg/Kg	1	8/27/2018 5:51:53 PM	39981
Ethylbenzene	ND	0.046		mg/Kg	1	8/27/2018 5:51:53 PM	39981
Xylenes, Total	ND	0.092		mg/Kg	1	8/27/2018 5:51:53 PM	39981
Surr: 4-Bromofluorobenzene	96.2	80-120		%Rec	1	8/27/2018 5:51:53 PM	39981

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1808E48

Date Reported: 8/29/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-29

Project: Lucerne 1

Collection Date: 8/22/2018 9:40:00 AM

Lab ID: 1808E48-004

Matrix: SOIL

Received Date: 8/23/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/27/2018 9:40:54 PM	39983
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/27/2018 9:40:54 PM	39983
Surr: DNOP	116	50.6-138		%Rec	1	8/27/2018 9:40:54 PM	39983
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/27/2018 6:15:19 PM	39981
Surr: BFB	91.1	15-316		%Rec	1	8/27/2018 6:15:19 PM	39981
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	8/27/2018 6:15:19 PM	39981
Toluene	ND	0.047		mg/Kg	1	8/27/2018 6:15:19 PM	39981
Ethylbenzene	ND	0.047		mg/Kg	1	8/27/2018 6:15:19 PM	39981
Xylenes, Total	ND	0.095		mg/Kg	1	8/27/2018 6:15:19 PM	39981
Surr: 4-Bromofluorobenzene	92.9	80-120		%Rec	1	8/27/2018 6:15:19 PM	39981

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808E48

29-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39983		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 39983		RunNo: 53721					
Prep Date:	8/24/2018		Analysis Date: 8/27/2018		SeqNo: 1772381		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	12		10.00		116	50.6	138			

Sample ID	LCS-39983		SampType:	LCS		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	LCSS		Batch ID:	39983		RunNo:	53721				
Prep Date:	8/24/2018		Analysis Date:	8/27/2018		SeqNo:	1773347		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	51	10	50.00	0	102	70	130				
Surr: DNOP	5.8		5.000		115	50.6	138				

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808E48

29-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39981		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBS		Batch ID: 39981		RunNo: 53734					
Prep Date:	8/24/2018		Analysis Date: 8/27/2018		SeqNo: 1772556		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	940		1000		93.6	15	316			

Sample ID	LCS-39981		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 39981		RunNo: 53734					
Prep Date:	8/24/2018		Analysis Date: 8/27/2018		SeqNo: 1772557		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	102	75.9	131			
Surr: BFB	1100		1000		106	15	316			

Sample ID	1808E48-002AMS		SampType: MS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	SC-27		Batch ID: 39981		RunNo: 53734					
Prep Date:	8/24/2018		Analysis Date: 8/27/2018		SeqNo: 1772560		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	31	4.6	23.06	0	133	77.8	128			S
Surr: BFB	990		922.5		108	15	316			

Sample ID	1808E48-002AMSD		SampType:	MSD		TestCode:	EPA Method 8015D: Gasoline Range				
Client ID:	SC-27		Batch ID:	39981		RunNo:	53734				
Prep Date:	8/24/2018		Analysis Date:	8/27/2018		SeqNo:	1772561		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Organics (GRO)	33	4.8	24.20	0	138	77.8	128	7.86	20	S	
Surr: BFB	1000		968.1		108	15	316	0	0		

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1808E48

29-Aug-18

Client: Rule Engineering LLC

Project: Lucerne 1

Sample ID	MB-39981		SampType:	MBLK		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	PBS		Batch ID:	39981		RunNo:	53734			
Prep Date:	8/24/2018		Analysis Date:	8/27/2018		SeqNo:	1772586		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.96		1.000		96.4	80	120			

Sample ID	LCS-39981		SampType:	LCS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	LCSS		Batch ID:	39981		RunNo:	53734			
Prep Date:	8/24/2018		Analysis Date:	8/27/2018		SeqNo:	1772587		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.0	77.3	128			
Toluene	0.96	0.050	1.000	0	96.2	79.2	125			
Ethylbenzene	0.96	0.050	1.000	0	96.0	80.7	127			
Xylenes, Total	2.9	0.10	3.000	0	97.6	81.6	129			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID	1808E48-001AMS		SampType:	MS		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-26		Batch ID:	39981		RunNo:	53734			
Prep Date:	8/24/2018		Analysis Date:	8/27/2018		SeqNo:	1772589		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9833	0.05335	96.7	68.5	133			
Toluene	1.1	0.049	0.9833	0.1845	90.1	75	130			
Ethylbenzene	1.0	0.049	0.9833	0.03352	101	79.4	128			
Xylenes, Total	3.2	0.098	2.950	0.3452	97.7	77.3	131			
Surr: 4-Bromofluorobenzene	0.94		0.9833		95.6	80	120			

Sample ID	1808E48-001AMSD		SampType:	MSD		TestCode:	EPA Method 8021B: Volatiles			
Client ID:	SC-26		Batch ID:	39981		RunNo:	53734			
Prep Date:	8/24/2018		Analysis Date:	8/27/2018		SeqNo:	1772590		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.023	0.9141	0.05335	95.4	68.5	133	8.17	20	
Toluene	1.0	0.046	0.9141	0.1845	90.0	75	130	6.16	20	
Ethylbenzene	0.96	0.046	0.9141	0.03352	101	79.4	128	6.60	20	
Xylenes, Total	3.0	0.091	2.742	0.3452	98.0	77.3	131	6.20	20	
Surr: 4-Bromofluorobenzene	0.87		0.9141		95.7	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1808E48

RcptNo: 1

Received By: Anne Thorne 8/23/2018 7:00:00 AM

Completed By: Anne Thorne 8/23/2018 9:39:09 AM

Reviewed By: JAB 08/24/18

Labeled by: JO 8/23/18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: JO
(<2 or >12 unless noted)
Adjusted? 8/23/18
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.3	Good	Yes			
2	1.0	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 18, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HEC Lucerne 1

OrderNo.: 1809830

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 4 sample(s) on 9/14/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809830**

Date Reported: **9/18/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-30

Project: HEC Lucerne 1

Collection Date: 9/13/2018 2:40:00 PM

Lab ID: 1809830-001

Matrix: SOIL

Received Date: 9/14/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	4.0		mg/Kg	1	9/14/2018 10:32:18 AM	A54152
Surr: BFB	105	70-130		%Rec	1	9/14/2018 10:32:18 AM	A54152
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: irm
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/14/2018 10:22:21 AM	40344
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/14/2018 10:22:21 AM	40344
Surr: DNOP	83.0	50.6-138		%Rec	1	9/14/2018 10:22:21 AM	40344
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.020		mg/Kg	1	9/14/2018 10:32:18 AM	B54152
Toluene	ND	0.040		mg/Kg	1	9/14/2018 10:32:18 AM	B54152
Ethylbenzene	ND	0.040		mg/Kg	1	9/14/2018 10:32:18 AM	B54152
Xylenes, Total	ND	0.081		mg/Kg	1	9/14/2018 10:32:18 AM	B54152
Surr: 4-Bromofluorobenzene	117	70-130		%Rec	1	9/14/2018 10:32:18 AM	B54152
Surr: Toluene-d8	100	70-130		%Rec	1	9/14/2018 10:32:18 AM	B54152

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809830**

Date Reported: **9/18/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-31

Project: HEC Lucerne 1

Collection Date: 9/13/2018 2:48:00 PM

Lab ID: 1809830-002

Matrix: SOIL

Received Date: 9/14/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	6.0	3.6		mg/Kg	1	9/14/2018 10:55:23 AM	A54152
Surr: BFB	110	70-130		%Rec	1	9/14/2018 10:55:23 AM	A54152
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/14/2018 10:46:44 AM	40344
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/14/2018 10:46:44 AM	40344
Surr: DNOP	84.2	50.6-138		%Rec	1	9/14/2018 10:46:44 AM	40344
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	0.019	0.018		mg/Kg	1	9/14/2018 10:55:23 AM	B54152
Toluene	ND	0.036		mg/Kg	1	9/14/2018 10:55:23 AM	B54152
Ethylbenzene	ND	0.036		mg/Kg	1	9/14/2018 10:55:23 AM	B54152
Xylenes, Total	0.29	0.071		mg/Kg	1	9/14/2018 10:55:23 AM	B54152
Surr: 4-Bromofluorobenzene	122	70-130		%Rec	1	9/14/2018 10:55:23 AM	B54152
Surr: Toluene-d8	94.8	70-130		%Rec	1	9/14/2018 10:55:23 AM	B54152

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank	Page 2 of 8
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified	

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809830**

Date Reported: **9/18/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-32

Project: HEC Lucerne 1

Collection Date: 9/13/2018 3:25:00 PM

Lab ID: 1809830-003

Matrix: SOIL

Received Date: 9/14/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.9		mg/Kg	1	9/14/2018 11:18:24 AM	A54152
Surr: BFB	104	70-130		%Rec	1	9/14/2018 11:18:24 AM	A54152
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/14/2018 11:11:02 AM	40344
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/14/2018 11:11:02 AM	40344
Surr: DNOP	83.8	50.6-138		%Rec	1	9/14/2018 11:11:02 AM	40344
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	0.038	0.020		mg/Kg	1	9/14/2018 11:18:24 AM	B54152
Toluene	0.15	0.039		mg/Kg	1	9/14/2018 11:18:24 AM	B54152
Ethylbenzene	ND	0.039		mg/Kg	1	9/14/2018 11:18:24 AM	B54152
Xylenes, Total	ND	0.079		mg/Kg	1	9/14/2018 11:18:24 AM	B54152
Surr: 4-Bromofluorobenzene	116	70-130		%Rec	1	9/14/2018 11:18:24 AM	B54152
Surr: Toluene-d8	94.7	70-130		%Rec	1	9/14/2018 11:18:24 AM	B54152

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809830**

Date Reported: **9/18/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-33

Project: HEC Lucerne 1

Collection Date: 9/13/2018 3:13:00 PM

Lab ID: 1809830-004

Matrix: SOIL

Received Date: 9/14/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	ND	3.9		mg/Kg	1	9/14/2018 11:41:32 AM	A54152
Surr: BFB	102	70-130		%Rec	1	9/14/2018 11:41:32 AM	A54152
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/14/2018 11:35:34 AM	40344
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/14/2018 11:35:34 AM	40344
Surr: DNOP	85.8	50.6-138		%Rec	1	9/14/2018 11:35:34 AM	40344
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.019		mg/Kg	1	9/14/2018 11:41:32 AM	B54152
Toluene	ND	0.039		mg/Kg	1	9/14/2018 11:41:32 AM	B54152
Ethylbenzene	ND	0.039		mg/Kg	1	9/14/2018 11:41:32 AM	B54152
Xylenes, Total	0.078	0.078		mg/Kg	1	9/14/2018 11:41:32 AM	B54152
Surr: 4-Bromofluorobenzene	115	70-130		%Rec	1	9/14/2018 11:41:32 AM	B54152
Surr: Toluene-d8	94.4	70-130		%Rec	1	9/14/2018 11:41:32 AM	B54152

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank	Page 4 of 8
	D	Sample Diluted Due to Matrix	E	Value above quantitation range	
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range	
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit	
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809830

18-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	MB-40344		SampType:	MBLK		TestCode:	EPA Method 8015M/D: Diesel Range Organics			
Client ID:	PBS		Batch ID:	40344		RunNo:	54142			
Prep Date:	9/14/2018		Analysis Date:	9/14/2018		SeqNo:	1790203		Units: mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	7.9		10.00		78.8	50.6	138			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809830

18-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID 100ng btex lcs	SampType: LCS4		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: BatchQC	Batch ID: B54152		RunNo: 54152							
Prep Date:	Analysis Date: 9/14/2018		SeqNo: 1790348		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	103	80	120			
Toluene	1.1	0.050	1.000	0	105	80	120			
Ethylbenzene	1.1	0.050	1.000	0	107	80	120			
Xylenes, Total	3.1	0.10	3.000	0	103	80	120			
Surr: 4-Bromofluorobenzene	0.46		0.5000		92.4	70	130			
Surr: Toluene-d8	0.49		0.5000		97.7	70	130			

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: PBS	Batch ID: B54152		RunNo: 54152							
Prep Date:	Analysis Date: 9/14/2018		SeqNo: 1790354		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.53		0.5000		106	70	130			
Surr: Toluene-d8	0.52		0.5000		104	70	130			

Sample ID 1809830-002ams	SampType: MS4		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: SC-31	Batch ID: B54152		RunNo: 54152							
Prep Date:	Analysis Date: 9/14/2018		SeqNo: 1791514		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.75	0.018	0.7133	0.01910	102	80	120			
Toluene	0.79	0.036	0.7133	0.02481	107	80	120			
Ethylbenzene	0.83	0.036	0.7133	0.03022	112	82	121			
Xylenes, Total	2.6	0.071	2.140	0.2895	109	80.2	120			
Surr: 4-Bromofluorobenzene	0.41		0.3566		115	70	130			
Surr: Toluene-d8	0.34		0.3566		95.4	70	130			

Sample ID 1809830-002amsd	SampType: MSD4		TestCode: EPA Method 8260B: Volatiles Short List							
Client ID: SC-31	Batch ID: B54152		RunNo: 54152							
Prep Date:	Analysis Date: 9/14/2018		SeqNo: 1791515		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.70	0.018	0.7133	0.01910	95.2	80	120	6.51	20	
Toluene	0.74	0.036	0.7133	0.02481	100	80	120	6.60	20	
Ethylbenzene	0.76	0.036	0.7133	0.03022	102	82	121	8.58	20	
Xylenes, Total	2.5	0.071	2.140	0.2895	103	80.2	120	5.22	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809830

18-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	1809830-002amsd	SampType:	MSD4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	SC-31	Batch ID:	B54152	RunNo:	54152					
Prep Date:		Analysis Date:	9/14/2018	SeqNo:	1791515	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.39		0.3566		109	70	130	0	0	
Surr: Toluene-d8	0.33		0.3566		92.9	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809830

18-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS	Batch ID:	A54152	RunNo:	54152					
Prep Date:		Analysis Date:	9/14/2018	SeqNo:	1790345	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	104	70	130			
Surr: BFB	450		500.0		89.3	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS	Batch ID:	A54152	RunNo:	54152					
Prep Date:		Analysis Date:	9/14/2018	SeqNo:	1790346	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		95.1	70	130			

Sample ID	1809830-001ams	SampType:	MS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-30	Batch ID:	A54152	RunNo:	54152					
Prep Date:		Analysis Date:	9/14/2018	SeqNo:	1791512	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.0	20.14	0	97.7	64.7	142			
Surr: BFB	380		402.9		95.3	70	130			

Sample ID	1809830-001amsd	SampType:	MSD	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	SC-30	Batch ID:	A54152	RunNo:	54152					
Prep Date:		Analysis Date:	9/14/2018	SeqNo:	1791513	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	4.0	20.14	0	95.6	64.7	142	2.15	20	
Surr: BFB	390		402.9		98.0	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1809830

RcptNo: 1

Received By: Anne Thorne

9/14/2018 7:00:00 AM

Anne Thorne

Completed By: Anne Thorne

9/14/2018 7:19:10 AM

Anne Thorne

Reviewed By:

JAB 09/14/18

Labeled by: AT 09/14/18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			
2	1.2	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 28, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HEC Lucerne 1

OrderNo.: 1809F05

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 8 sample(s) on 9/26/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809F05**

Date Reported: **9/28/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-34

Project: HEC Lucerne 1

Collection Date: 9/25/2018 2:24:00 PM

Lab ID: 1809F05-001

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/26/2018 11:06:06 AM	40586
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/26/2018 11:06:06 AM	40586
Surr: DNOP	121	50.6-138		%Rec	1	9/26/2018 11:06:06 AM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	18		mg/Kg	5	9/26/2018 9:36:18 AM	A54425
Surr: BFB	89.9	15-316		%Rec	5	9/26/2018 9:36:18 AM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.090		mg/Kg	5	9/26/2018 9:36:18 AM	C54425
Toluene	ND	0.18		mg/Kg	5	9/26/2018 9:36:18 AM	C54425
Ethylbenzene	ND	0.18		mg/Kg	5	9/26/2018 9:36:18 AM	C54425
Xylenes, Total	ND	0.36		mg/Kg	5	9/26/2018 9:36:18 AM	C54425
Surr: 4-Bromofluorobenzene	88.6	80-120		%Rec	5	9/26/2018 9:36:18 AM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809F05**

Date Reported: **9/28/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-35

Project: HEC Lucerne 1

Collection Date: 9/25/2018 1:32:00 PM

Lab ID: 1809F05-002

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/26/2018 11:30:42 AM	40586
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/26/2018 11:30:42 AM	40586
Surr: DNOP	121	50.6-138		%Rec	1	9/26/2018 11:30:42 AM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	9/26/2018 9:59:50 AM	A54425
Surr: BFB	90.1	15-316		%Rec	1	9/26/2018 9:59:50 AM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.018		mg/Kg	1	9/26/2018 9:59:50 AM	C54425
Toluene	ND	0.037		mg/Kg	1	9/26/2018 9:59:50 AM	C54425
Ethylbenzene	ND	0.037		mg/Kg	1	9/26/2018 9:59:50 AM	C54425
Xylenes, Total	ND	0.073		mg/Kg	1	9/26/2018 9:59:50 AM	C54425
Surr: 4-Bromofluorobenzene	89.9	80-120		%Rec	1	9/26/2018 9:59:50 AM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809F05**

Date Reported: **9/28/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-36

Project: HEC Lucerne 1

Collection Date: 9/25/2018 2:02:00 PM

Lab ID: 1809F05-003

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/26/2018 11:55:08 AM	40586
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/26/2018 11:55:08 AM	40586
Surr: DNOP	119	50.6-138		%Rec	1	9/26/2018 11:55:08 AM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	9/26/2018 10:23:21 AM	A54425
Surr: BFB	93.8	15-316		%Rec	1	9/26/2018 10:23:21 AM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.019		mg/Kg	1	9/26/2018 10:23:21 AM	C54425
Toluene	ND	0.038		mg/Kg	1	9/26/2018 10:23:21 AM	C54425
Ethylbenzene	ND	0.038		mg/Kg	1	9/26/2018 10:23:21 AM	C54425
Xylenes, Total	ND	0.075		mg/Kg	1	9/26/2018 10:23:21 AM	C54425
Surr: 4-Bromofluorobenzene	91.8	80-120		%Rec	1	9/26/2018 10:23:21 AM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809F05**

Date Reported: **9/28/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-37

Project: HEC Lucerne 1

Collection Date: 9/25/2018 2:15:00 PM

Lab ID: 1809F05-004

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/26/2018 12:19:43 PM	40586
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/26/2018 12:19:43 PM	40586
Surr: DNOP	119	50.6-138		%Rec	1	9/26/2018 12:19:43 PM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.9		mg/Kg	1	9/26/2018 10:46:54 AM	A54425
Surr: BFB	90.3	15-316		%Rec	1	9/26/2018 10:46:54 AM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.019		mg/Kg	1	9/26/2018 10:46:54 AM	C54425
Toluene	ND	0.039		mg/Kg	1	9/26/2018 10:46:54 AM	C54425
Ethylbenzene	ND	0.039		mg/Kg	1	9/26/2018 10:46:54 AM	C54425
Xylenes, Total	ND	0.078		mg/Kg	1	9/26/2018 10:46:54 AM	C54425
Surr: 4-Bromofluorobenzene	90.4	80-120		%Rec	1	9/26/2018 10:46:54 AM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1809F05

Date Reported: 9/28/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-38

Project: HEC Lucerne 1

Collection Date: 9/25/2018 1:39:00 PM

Lab ID: 1809F05-005

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	170	9.7		mg/Kg	1	9/26/2018 12:44:09 PM	40586
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/26/2018 12:44:09 PM	40586
Surr: DNOP	124	50.6-138		%Rec	1	9/26/2018 12:44:09 PM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	26	20		mg/Kg	5	9/26/2018 11:10:25 AM	A54425
Surr: BFB	136	15-316		%Rec	5	9/26/2018 11:10:25 AM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.099		mg/Kg	5	9/26/2018 11:10:25 AM	C54425
Toluene	ND	0.20		mg/Kg	5	9/26/2018 11:10:25 AM	C54425
Ethylbenzene	ND	0.20		mg/Kg	5	9/26/2018 11:10:25 AM	C54425
Xylenes, Total	1.3	0.40		mg/Kg	5	9/26/2018 11:10:25 AM	C54425
Surr: 4-Bromofluorobenzene	93.1	80-120		%Rec	5	9/26/2018 11:10:25 AM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809F05**

Date Reported: **9/28/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-39

Project: HEC Lucerne 1

Collection Date: 9/25/2018 1:46:00 PM

Lab ID: 1809F05-006

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/26/2018 1:08:40 PM	40586
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/26/2018 1:08:40 PM	40586
Surr: DNOP	106	50.6-138		%Rec	1	9/26/2018 1:08:40 PM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/26/2018 11:57:25 AM	A54425
Surr: BFB	91.2	15-316		%Rec	1	9/26/2018 11:57:25 AM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.023		mg/Kg	1	9/26/2018 11:57:25 AM	C54425
Toluene	ND	0.046		mg/Kg	1	9/26/2018 11:57:25 AM	C54425
Ethylbenzene	ND	0.046		mg/Kg	1	9/26/2018 11:57:25 AM	C54425
Xylenes, Total	ND	0.093		mg/Kg	1	9/26/2018 11:57:25 AM	C54425
Surr: 4-Bromofluorobenzene	88.4	80-120		%Rec	1	9/26/2018 11:57:25 AM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809F05**

Date Reported: **9/28/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-40

Project: HEC Lucerne 1

Collection Date: 9/25/2018 1:52:00 PM

Lab ID: 1809F05-007

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/26/2018 1:33:00 PM	40586
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/26/2018 1:33:00 PM	40586
Surr: DNOP	95.3	50.6-138		%Rec	1	9/26/2018 1:33:00 PM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.2		mg/Kg	1	9/26/2018 12:20:47 PM	A54425
Surr: BFB	99.1	15-316		%Rec	1	9/26/2018 12:20:47 PM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.026	0.021		mg/Kg	1	9/26/2018 12:20:47 PM	C54425
Toluene	ND	0.042		mg/Kg	1	9/26/2018 12:20:47 PM	C54425
Ethylbenzene	ND	0.042		mg/Kg	1	9/26/2018 12:20:47 PM	C54425
Xylenes, Total	0.13	0.083		mg/Kg	1	9/26/2018 12:20:47 PM	C54425
Surr: 4-Bromofluorobenzene	92.7	80-120		%Rec	1	9/26/2018 12:20:47 PM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809F05**

Date Reported: **9/28/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-41

Project: HEC Lucerne 1

Collection Date: 9/25/2018 2:31:00 PM

Lab ID: 1809F05-008

Matrix: SOIL

Received Date: 9/26/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/26/2018 1:57:27 PM	40586
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/26/2018 1:57:27 PM	40586
Surr: DNOP	103	50.6-138		%Rec	1	9/26/2018 1:57:27 PM	40586
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.1		mg/Kg	1	9/26/2018 12:44:08 PM	A54425
Surr: BFB	91.5	15-316		%Rec	1	9/26/2018 12:44:08 PM	A54425
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.020		mg/Kg	1	9/26/2018 12:44:08 PM	C54425
Toluene	ND	0.041		mg/Kg	1	9/26/2018 12:44:08 PM	C54425
Ethylbenzene	ND	0.041		mg/Kg	1	9/26/2018 12:44:08 PM	C54425
Xylenes, Total	ND	0.081		mg/Kg	1	9/26/2018 12:44:08 PM	C54425
Surr: 4-Bromofluorobenzene	90.0	80-120		%Rec	1	9/26/2018 12:44:08 PM	C54425

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809F05

28-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	MB-40586	SampType:	MBLK		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	PBS	Batch ID:	40586		RunNo:	54424				
Prep Date:	9/26/2018	Analysis Date:	9/26/2018		SeqNo:	1803489		Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		110	50.6	138			

Sample ID	LCS-40586		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 40586		RunNo: 54424					
Prep Date:	9/26/2018		Analysis Date: 9/26/2018		SeqNo: 1803490		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	109	70	130			
Surr: DNOP	5.7		5.000		113	50.6	138			

Sample ID	1809F05-008AMS		SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-41		Batch ID: 40586		RunNo: 54424					
Prep Date:	9/26/2018		Analysis Date: 9/26/2018		SeqNo: 1805096		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	9.6	48.08	0	97.0	53.5	126			
Surr: DNOP	4.9		4.808		101	50.6	138			

Sample ID	1809F05-008AMSD		SampType:	MSD		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	SC-41		Batch ID:	40586		RunNo:	54424				
Prep Date:	9/26/2018		Analysis Date:	9/26/2018		SeqNo:	1805097		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	48	9.9	49.65	0	96.6	53.5	126	2.82	21.7		
Surr: DNOP	5.0		4.965		101	50.6	138	0	0		

Sample ID	LCS-40568			SampType:	LCS		TestCode:	EPA Method 8015M/D: Diesel Range Organics			
Client ID:	LCSS			Batch ID:	40568		RunNo:	54424			
Prep Date:	9/25/2018			Analysis Date:	9/26/2018		SeqNo:	1805098		Units:	%Rec
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Surr: DNOP	5.1		5.000		101	50.6	138				

Sample ID	MB-40568		SampType:	MBLK		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	PBS		Batch ID:	40568		RunNo:	54424				
Prep Date:	9/25/2018		Analysis Date:	9/26/2018		SeqNo:	1805099		Units: %Rec		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809F05

28-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	MB-40568		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 40568		RunNo: 54424					
Prep Date:	9/25/2018		Analysis Date: 9/26/2018		SeqNo: 1805099		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	11		10.00		106	50.6	138			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809F05

28-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBS	Batch ID:	A54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804180	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	950		1000		94.9	15	316			

Sample ID	2.5UG GRO LCS	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	A54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804181	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	113	75.9	131			
Surr: BFB	1100		1000		109	15	316			

Sample ID	1809F05-001AMS	SampType:	MS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-34	Batch ID:	A54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804182	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	91	18	90.06	0	101	77.8	128			
Surr: BFB	3800		3602		106	15	316			

Sample ID	1809F05-001AMSD	SampType:	MSD	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-34	Batch ID:	A54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804183	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	91	18	90.06	0	101	77.8	128	0.119	20	
Surr: BFB	3800		3602		106	15	316	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809F05

28-Sep-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	PBS	Batch ID:	C54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804203	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.94		1.000		94.1	80	120			

Sample ID	100NG BTEX LCS	SampType:	LCS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	LCSS	Batch ID:	C54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804204	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.3	77.3	128			
Toluene	0.96	0.050	1.000	0	96.2	79.2	125			
Ethylbenzene	0.95	0.050	1.000	0	94.6	80.7	127			
Xylenes, Total	2.8	0.10	3.000	0	94.5	81.6	129			
Surr: 4-Bromofluorobenzene	0.95		1.000		95.0	80	120			

Sample ID	1809F05-002AMS	SampType:	MS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	SC-35	Batch ID:	C54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804205	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.70	0.018	0.7305	0.01585	94.3	68.5	133			
Toluene	0.73	0.037	0.7305	0.01235	98.1	75	130			
Ethylbenzene	0.70	0.037	0.7305	0.008547	94.7	79.4	128			
Xylenes, Total	2.1	0.073	2.192	0.03119	95.1	77.3	131			
Surr: 4-Bromofluorobenzene	0.69		0.7305		94.8	80	120			

Sample ID	1809F05-002AMSD	SampType:	MSD	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	SC-35	Batch ID:	C54425	RunNo:	54425					
Prep Date:		Analysis Date:	9/26/2018	SeqNo:	1804206	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.69	0.018	0.7305	0.01585	91.7	68.5	133	2.79	20	
Toluene	0.71	0.037	0.7305	0.01235	94.9	75	130	3.26	20	
Ethylbenzene	0.69	0.037	0.7305	0.008547	92.7	79.4	128	2.12	20	
Xylenes, Total	2.1	0.073	2.192	0.03119	92.7	77.3	131	2.58	20	
Surr: 4-Bromofluorobenzene	0.67		0.7305		92.0	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: **RULE ENGINEERING LL**

Work Order Number: **1809F05**

RcptNo: **1**

Received By: **Anne Thorne**

9/26/2018 7:00:00 AM

Anne Thorne

Completed By: **Anne Thorne**

9/26/2018 7:14:31 AM

Anne Thorne

Reviewed By: **JO**

9/26/18

Labeled by: AS 09/26/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐

2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐

4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐

5. Sample(s) in proper container(s)? Yes ☒ No ☐

6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐

7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐

8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐

9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒

10. Were any sample containers received broken? Yes ☐ No ☒

11. Does paperwork match bottle labels? Yes ☒ No ☐

(Note discrepancies on chain of custody)

12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐

13. Is it clear what analyses were requested? Yes ☒ No ☐

14. Were all holding times able to be met? Yes ☒ No ☐

(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date:

By Whom:

Via:

☐ eMail

☐ Phone

☐ Fax

☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.1	Good	Yes			

Chain-of-Custody Record

Client: Rule Engineering LLC
 Mailing Address: 501 Airport Dr., Ste 205
Farmington NM 87401
 Phone #: (505) 716-2787
 email or Fax#: hwoods@ruleengineering.com

QA/QC Package: ☒ Standard ☐ Level 4 (Full Validation) ☐ Other _____
 Accreditation ☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Date	Time	Matrix	Sample Request ID
9/25/10	1424	Soil	SC-34
9/25/10	1332	Soil	SC-35
9/25/10	1402	Soil	SC-36
9/25/10	1415	Soil	SC-37
9/25/10	1339	Soil	SC-38
9/25/10	1346	Soil	SC-39
9/25/10	1352	Soil	SC-40
9/25/10	1431	Soil	SC-41

NFS HHS
 Date: 9/25/10 Time: 1730 Relinquished by: Heather Woods
 Date: 9/25/10 Time: 1800 Relinquished by: Justin Woods

Turn-Around Time:

☐ Standard ☒ Rush Same Day
 Project Name: HEC Lucerne #1
 Project #: _____

Project Manager:

Heather Woods
 Sampler: Heather Woods / Justin Woods
 On Ice: ☒ Yes ☐ No
 Sample Temperature: 21.1 °C (69.8) °F

Container Type and #	Preservative Type	HEAL No.
<u>100ml</u>	<u>None</u>	<u>130965</u>
<u>100ml</u>	<u>None</u>	<u>130965</u>
<u>100ml</u>	<u>None</u>	<u>130965</u>
<u>100ml</u>	<u>None</u>	<u>130965</u>
<u>100ml</u>	<u>None</u>	<u>130965</u>
<u>100ml</u>	<u>None</u>	<u>130965</u>
<u>100ml</u>	<u>None</u>	<u>130965</u>
<u>100ml</u>	<u>None</u>	<u>130965</u>

Received by: Justin Woods Date: 9/25/10 Time: 1730
 Received by: Justin Woods Date: 9/25/10 Time: 1800

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:

Direct Bill to Hilcorp
c/o Clara Cardoza



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 02, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HEC Lucerne 1

OrderNo.: 1809G88

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/28/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1809G88**

Date Reported: **10/2/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-38R

Project: HEC Lucerne 1

Collection Date: 9/27/2018 1:45:00 PM

Lab ID: 1809G88-001

Matrix: MEOH (SOIL)

Received Date: 9/28/2018 8:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: AG
Gasoline Range Organics (GRO)	23	21		mg/Kg	5	9/28/2018 2:53:11 PM	A54515
Surr: BFB	90.3	70-130		%Rec	5	9/28/2018 2:53:11 PM	A54515
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: lrm
Diesel Range Organics (DRO)	54	9.9		mg/Kg	1	9/28/2018 10:26:13 AM	40652
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/28/2018 10:26:13 AM	40652
Surr: DNOP	104	50.6-138		%Rec	1	9/28/2018 10:26:13 AM	40652
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: AG
Benzene	ND	0.10		mg/Kg	5	9/28/2018 2:53:11 PM	B54515
Toluene	ND	0.21		mg/Kg	5	9/28/2018 2:53:11 PM	B54515
Ethylbenzene	ND	0.21		mg/Kg	5	9/28/2018 2:53:11 PM	B54515
Xylenes, Total	0.52	0.41		mg/Kg	5	9/28/2018 2:53:11 PM	B54515
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	5	9/28/2018 2:53:11 PM	B54515
Surr: Toluene-d8	95.6	70-130		%Rec	5	9/28/2018 2:53:11 PM	B54515

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G88

02-Oct-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	1809G88-001AMS	SampType:	MS	TestCode:	EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-38R	Batch ID:	40652	RunNo:	54488					
Prep Date:	9/28/2018	Analysis Date:	9/28/2018	SeqNo:	1807199	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	120	10	50.00	54.45	123	53.5	126			
Surr: DNOP	4.7		5.000		94.9	50.6	138			

Sample ID	1809G88-001AMSD	SampType:	MSD	TestCode:	EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-38R	Batch ID:	40652	RunNo:	54488					
Prep Date:	9/28/2018	Analysis Date:	9/28/2018	SeqNo:	1807200	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	110	9.8	48.83	54.45	118	53.5	126	3.55	21.7	
Surr: DNOP	4.9		4.883		101	50.6	138	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G88

02-Oct-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	100ng btex lcs	SampType:	LCS4	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	BatchQC	Batch ID:	B54515	RunNo:	54515					
Prep Date:		Analysis Date:	9/28/2018	SeqNo:	1807139	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	105	80	120			
Toluene	1.1	0.050	1.000	0	107	80	120			
Ethylbenzene	1.0	0.050	1.000	0	105	80	120			
Xylenes, Total	3.2	0.10	3.000	0	106	80	120			
Surr: 4-Bromofluorobenzene	0.44		0.5000		88.2	70	130			
Surr: Toluene-d8	0.49		0.5000		98.8	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: Volatiles Short List					
Client ID:	PBS	Batch ID:	B54515	RunNo:	54515					
Prep Date:		Analysis Date:	9/28/2018	SeqNo:	1807148	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.0	70	130			
Surr: Toluene-d8	0.48		0.5000		96.4	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G88

02-Oct-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	2.5ug gro lcs	SampType:	LCS	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	LCSS	Batch ID:	A54515	RunNo:	54515					
Prep Date:		Analysis Date:	9/28/2018	SeqNo:	1807134	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	88.2	70	130			
Surr: BFB	370		500.0		74.0	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8015D Mod: Gasoline Range					
Client ID:	PBS	Batch ID:	A54515	RunNo:	54515					
Prep Date:		Analysis Date:	9/28/2018	SeqNo:	1807135	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	420		500.0		84.8	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: **RULE ENGINEERING LL**

Work Order Number: **1809G88**

RcptNo: 1

Received By: **Anne Thorne** 9/28/2018 8:40:00 AM

Completed By: **Ashley Gallegos** 9/28/2018 9:06:00 AM

Reviewed By: **ENM** 9/28/18

Labelled by: JU 9.28.18

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: 50
 (<2 or >12 unless noted)

Adjusted? 50

Checked by: 9.28.18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.3	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 02, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HEC Lucerne 1

OrderNo.: 1811004

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 14 sample(s) on 11/1/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-38

Project: HEC Lucerne 1

Collection Date: 10/31/2018 10:18:00 AM

Lab ID: 1811004-001

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	130	9.9		mg/Kg	1	11/1/2018 11:20:10 AM	41308
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/1/2018 11:20:10 AM	41308
Surr: DNOP	95.4	50.6-138		%Rec	1	11/1/2018 11:20:10 AM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	99	22		mg/Kg	5	11/1/2018 9:00:35 AM	G55335
Surr: BFB	299	73.8-119	S	%Rec	5	11/1/2018 9:00:35 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.11		mg/Kg	5	11/1/2018 9:00:35 AM	B55335
Toluene	ND	0.22		mg/Kg	5	11/1/2018 9:00:35 AM	B55335
Ethylbenzene	0.39	0.22		mg/Kg	5	11/1/2018 9:00:35 AM	B55335
Xylenes, Total	0.89	0.44		mg/Kg	5	11/1/2018 9:00:35 AM	B55335
Surr: 4-Bromofluorobenzene	99.8	80-120		%Rec	5	11/1/2018 9:00:35 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811004**

Date Reported: **11/2/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-39

Project: HEC Lucerne 1

Collection Date: 10/31/2018 10:24:00 AM

Lab ID: 1811004-002

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	11/1/2018 11:44:27 AM	41308
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/1/2018 11:44:27 AM	41308
Surr: DNOP	98.9	50.6-138		%Rec	1	11/1/2018 11:44:27 AM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.2		mg/Kg	1	11/1/2018 9:23:20 AM	G55335
Surr: BFB	108	73.8-119		%Rec	1	11/1/2018 9:23:20 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.021		mg/Kg	1	11/1/2018 9:23:20 AM	B55335
Toluene	ND	0.042		mg/Kg	1	11/1/2018 9:23:20 AM	B55335
Ethylbenzene	ND	0.042		mg/Kg	1	11/1/2018 9:23:20 AM	B55335
Xylenes, Total	ND	0.085		mg/Kg	1	11/1/2018 9:23:20 AM	B55335
Surr: 4-Bromofluorobenzene	94.3	80-120		%Rec	1	11/1/2018 9:23:20 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1811004

Date Reported: 11/2/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-40

Project: HEC Lucerne 1

Collection Date: 10/31/2018 10:33:00 AM

Lab ID: 1811004-003

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	11/1/2018 12:08:40 PM	41308
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/1/2018 12:08:40 PM	41308
Surr: DNOP	101	50.6-138		%Rec	1	11/1/2018 12:08:40 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.0		mg/Kg	1	11/1/2018 9:46:05 AM	G55335
Surr: BFB	119	73.8-119	S	%Rec	1	11/1/2018 9:46:05 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.020		mg/Kg	1	11/1/2018 9:46:05 AM	B55335
Toluene	ND	0.040		mg/Kg	1	11/1/2018 9:46:05 AM	B55335
Ethylbenzene	ND	0.040		mg/Kg	1	11/1/2018 9:46:05 AM	B55335
Xylenes, Total	ND	0.081		mg/Kg	1	11/1/2018 9:46:05 AM	B55335
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	11/1/2018 9:46:05 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811004**

Date Reported: **11/2/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-41

Project: HEC Lucerne 1

Collection Date: 10/31/2018 10:44:00 AM

Lab ID: 1811004-004

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	75	9.8		mg/Kg	1	11/1/2018 12:32:58 PM	41308
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/1/2018 12:32:58 PM	41308
Surr: DNOP	103	50.6-138		%Rec	1	11/1/2018 12:32:58 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	20		mg/Kg	5	11/1/2018 10:08:48 AM	G55335
Surr: BFB	125	73.8-119	S	%Rec	5	11/1/2018 10:08:48 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.098		mg/Kg	5	11/1/2018 10:08:48 AM	B55335
Toluene	ND	0.20		mg/Kg	5	11/1/2018 10:08:48 AM	B55335
Ethylbenzene	ND	0.20		mg/Kg	5	11/1/2018 10:08:48 AM	B55335
Xylenes, Total	ND	0.39		mg/Kg	5	11/1/2018 10:08:48 AM	B55335
Surr: 4-Bromofluorobenzene	95.5	80-120		%Rec	5	11/1/2018 10:08:48 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811004**Date Reported: **11/2/2018****CLIENT:** Rule Engineering LLC**Client Sample ID:** SC-42**Project:** HEC Lucerne 1**Collection Date:** 10/31/2018 10:50:00 AM**Lab ID:** 1811004-005**Matrix:** MEOH (SOIL)**Received Date:** 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	65	10		mg/Kg	1	11/1/2018 12:57:13 PM	41308
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	11/1/2018 12:57:13 PM	41308
Surr: DNOP	107	50.6-138		%Rec	1	11/1/2018 12:57:13 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	20		mg/Kg	5	11/1/2018 10:31:35 AM	G55335
Surr: BFB	118	73.8-119		%Rec	5	11/1/2018 10:31:35 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.10		mg/Kg	5	11/1/2018 10:31:35 AM	B55335
Toluene	ND	0.20		mg/Kg	5	11/1/2018 10:31:35 AM	B55335
Ethylbenzene	ND	0.20		mg/Kg	5	11/1/2018 10:31:35 AM	B55335
Xylenes, Total	ND	0.40		mg/Kg	5	11/1/2018 10:31:35 AM	B55335
Surr: 4-Bromofluorobenzene	95.0	80-120		%Rec	5	11/1/2018 10:31:35 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811004**

Date Reported: **11/2/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-43

Project: HEC Lucerne 1

Collection Date: 10/31/2018 10:59:00 AM

Lab ID: 1811004-006

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	11/1/2018 1:45:54 PM	41308
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/1/2018 1:45:54 PM	41308
Surr: DNOP	104	50.6-138		%Rec	1	11/1/2018 1:45:54 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.2		mg/Kg	1	11/1/2018 10:54:21 AM	G55335
Surr: BFB	91.1	73.8-119		%Rec	1	11/1/2018 10:54:21 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.021		mg/Kg	1	11/1/2018 10:54:21 AM	B55335
Toluene	ND	0.042		mg/Kg	1	11/1/2018 10:54:21 AM	B55335
Ethylbenzene	ND	0.042		mg/Kg	1	11/1/2018 10:54:21 AM	B55335
Xylenes, Total	ND	0.084		mg/Kg	1	11/1/2018 10:54:21 AM	B55335
Surr: 4-Bromofluorobenzene	91.1	80-120		%Rec	1	11/1/2018 10:54:21 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1811004

Date Reported: 11/2/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-44

Project: HEC Lucerne 1

Collection Date: 10/31/2018 11:08:00 AM

Lab ID: 1811004-007

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	310	9.9		mg/Kg	1	11/1/2018 2:10:26 PM	41308
Motor Oil Range Organics (MRO)	68	50		mg/Kg	1	11/1/2018 2:10:26 PM	41308
Surr: DNOP	110	50.6-138		%Rec	1	11/1/2018 2:10:26 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	38	20		mg/Kg	5	11/1/2018 11:16:58 AM	G55335
Surr: BFB	165	73.8-119	S	%Rec	5	11/1/2018 11:16:58 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.10		mg/Kg	5	11/1/2018 11:16:58 AM	B55335
Toluene	ND	0.20		mg/Kg	5	11/1/2018 11:16:58 AM	B55335
Ethylbenzene	ND	0.20		mg/Kg	5	11/1/2018 11:16:58 AM	B55335
Xylenes, Total	1.1	0.41		mg/Kg	5	11/1/2018 11:16:58 AM	B55335
Surr: 4-Bromofluorobenzene	97.3	80-120		%Rec	5	11/1/2018 11:16:58 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1811004

Date Reported: 11/2/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-45

Project: HEC Lucerne 1

Collection Date: 10/31/2018 11:14:00 AM

Lab ID: 1811004-008

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	51	9.7		mg/Kg	1	11/1/2018 2:34:44 PM	41308
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/1/2018 2:34:44 PM	41308
Surr: DNOP	103	50.6-138		%Rec	1	11/1/2018 2:34:44 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	29	21		mg/Kg	5	11/1/2018 11:39:30 AM	G55335
Surr: BFB	135	73.8-119	S	%Rec	5	11/1/2018 11:39:30 AM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.11		mg/Kg	5	11/1/2018 11:39:30 AM	B55335
Toluene	0.25	0.21		mg/Kg	5	11/1/2018 11:39:30 AM	B55335
Ethylbenzene	ND	0.21		mg/Kg	5	11/1/2018 11:39:30 AM	B55335
Xylenes, Total	1.7	0.43		mg/Kg	5	11/1/2018 11:39:30 AM	B55335
Surr: 4-Bromofluorobenzene	93.8	80-120		%Rec	5	11/1/2018 11:39:30 AM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811004**

Date Reported: **11/2/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-46

Project: HEC Lucerne 1

Collection Date: 10/31/2018 11:21:00 AM

Lab ID: 1811004-009

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	12	9.7		mg/Kg	1	11/1/2018 1:37:27 PM	41308
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/1/2018 1:37:27 PM	41308
Surr: DNOP	97.3	50.6-138		%Rec	1	11/1/2018 1:37:27 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	22		mg/Kg	5	11/1/2018 12:02:09 PM	G55335
Surr: BFB	103	73.8-119		%Rec	5	11/1/2018 12:02:09 PM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.11		mg/Kg	5	11/1/2018 12:02:09 PM	B55335
Toluene	ND	0.22		mg/Kg	5	11/1/2018 12:02:09 PM	B55335
Ethylbenzene	ND	0.22		mg/Kg	5	11/1/2018 12:02:09 PM	B55335
Xylenes, Total	ND	0.45		mg/Kg	5	11/1/2018 12:02:09 PM	B55335
Surr: 4-Bromofluorobenzene	97.2	80-120		%Rec	5	11/1/2018 12:02:09 PM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1811004

Date Reported: 11/2/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-47

Project: HEC Lucerne 1

Collection Date: 10/31/2018 11:31:00 AM

Lab ID: 1811004-010

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	120	9.9		mg/Kg	1	11/1/2018 1:59:31 PM	41308
Motor Oil Range Organics (MRO)	52	49		mg/Kg	1	11/1/2018 1:59:31 PM	41308
Surr: DNOP	102	50.6-138		%Rec	1	11/1/2018 1:59:31 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	110	21		mg/Kg	5	11/1/2018 12:24:44 PM	G55335
Surr: BFB	267	73.8-119	S	%Rec	5	11/1/2018 12:24:44 PM	G55335
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.10		mg/Kg	5	11/1/2018 12:24:44 PM	B55335
Toluene	0.54	0.21		mg/Kg	5	11/1/2018 12:24:44 PM	B55335
Ethylbenzene	0.60	0.21		mg/Kg	5	11/1/2018 12:24:44 PM	B55335
Xylenes, Total	6.0	0.41		mg/Kg	5	11/1/2018 12:24:44 PM	B55335
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	5	11/1/2018 12:24:44 PM	B55335

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-48

Project: HEC Lucerne 1

Collection Date: 10/31/2018 11:41:00 AM

Lab ID: 1811004-011

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	150	9.6		mg/Kg	1	11/1/2018 2:21:48 PM	41308
Motor Oil Range Organics (MRO)	59	48		mg/Kg	1	11/1/2018 2:21:48 PM	41308
Surr: DNOP	105	50.6-138		%Rec	1	11/1/2018 2:21:48 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	58	21		mg/Kg	5	11/1/2018 9:31:10 AM	G55334
Surr: BFB	190	73.8-119	S	%Rec	5	11/1/2018 9:31:10 AM	G55334
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.11		mg/Kg	5	11/1/2018 9:31:10 AM	B55334
Toluene	ND	0.21		mg/Kg	5	11/1/2018 9:31:10 AM	B55334
Ethylbenzene	0.22	0.21		mg/Kg	5	11/1/2018 9:31:10 AM	B55334
Xylenes, Total	2.0	0.43		mg/Kg	5	11/1/2018 9:31:10 AM	B55334
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	5	11/1/2018 9:31:10 AM	B55334

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811004**

Date Reported: **11/2/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-49

Project: HEC Lucerne 1

Collection Date: 10/31/2018 11:57:00 AM

Lab ID: 1811004-012

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: JME
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/1/2018 1:15:54 PM	41308
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	11/1/2018 1:15:54 PM	41308
Surr: DNOP	99.3	50.6-138		%Rec	1	11/1/2018 1:15:54 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.3		mg/Kg	1	11/1/2018 9:54:42 AM	G55334
Surr: BFB	103	73.8-119		%Rec	1	11/1/2018 9:54:42 AM	G55334
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.021		mg/Kg	1	11/1/2018 9:54:42 AM	B55334
Toluene	ND	0.043		mg/Kg	1	11/1/2018 9:54:42 AM	B55334
Ethylbenzene	ND	0.043		mg/Kg	1	11/1/2018 9:54:42 AM	B55334
Xylenes, Total	ND	0.085		mg/Kg	1	11/1/2018 9:54:42 AM	B55334
Surr: 4-Bromofluorobenzene	89.1	80-120		%Rec	1	11/1/2018 9:54:42 AM	B55334

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811004**

Date Reported: **11/2/2018**

CLIENT: Rule Engineering LLC

Client Sample ID: SC-50

Project: HEC Lucerne 1

Collection Date: 10/31/2018 12:09:00 PM

Lab ID: 1811004-013

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: JME
Diesel Range Organics (DRO)	19	9.4		mg/Kg	1	11/1/2018 1:39:52 PM	41308
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	11/1/2018 1:39:52 PM	41308
Surr: DNOP	103	50.6-138		%Rec	1	11/1/2018 1:39:52 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	5.2	3.9		mg/Kg	1	11/1/2018 10:18:11 AM	G55334
Surr: BFB	154	73.8-119	S	%Rec	1	11/1/2018 10:18:11 AM	G55334
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.020		mg/Kg	1	11/1/2018 10:18:11 AM	B55334
Toluene	ND	0.039		mg/Kg	1	11/1/2018 10:18:11 AM	B55334
Ethylbenzene	ND	0.039		mg/Kg	1	11/1/2018 10:18:11 AM	B55334
Xylenes, Total	ND	0.078		mg/Kg	1	11/1/2018 10:18:11 AM	B55334
Surr: 4-Bromofluorobenzene	91.6	80-120		%Rec	1	11/1/2018 10:18:11 AM	B55334

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1811004

Date Reported: 11/2/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-51

Project: HEC Lucerne 1

Collection Date: 10/31/2018 12:20:00 PM

Lab ID: 1811004-014

Matrix: MEOH (SOIL)

Received Date: 11/1/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: JME
Diesel Range Organics (DRO)	110	9.6		mg/Kg	1	11/1/2018 2:03:55 PM	41308
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/1/2018 2:03:55 PM	41308
Surr: DNOP	103	50.6-138		%Rec	1	11/1/2018 2:03:55 PM	41308
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	400	18		mg/Kg	5	11/1/2018 10:41:36 AM	G55334
Surr: BFB	626	73.8-119	S	%Rec	5	11/1/2018 10:41:36 AM	G55334
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.59	0.089		mg/Kg	5	11/1/2018 10:41:36 AM	B55334
Toluene	3.1	0.18		mg/Kg	5	11/1/2018 10:41:36 AM	B55334
Ethylbenzene	2.4	0.18		mg/Kg	5	11/1/2018 10:41:36 AM	B55334
Xylenes, Total	26	0.35		mg/Kg	5	11/1/2018 10:41:36 AM	B55334
Surr: 4-Bromofluorobenzene	117	80-120		%Rec	5	11/1/2018 10:41:36 AM	B55334

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811004

02-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	LCS-41301		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 41301		RunNo: 55288					
Prep Date:	10/31/2018		Analysis Date: 11/1/2018		SeqNo: 1840909		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.4		5.000		88.9	50.6	138			

Sample ID	MB-41301		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 41301		RunNo: 55288					
Prep Date:	10/31/2018		Analysis Date: 11/1/2018		SeqNo: 1840910		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.8		10.00		97.8	50.6	138			

Sample ID	LCS-41308		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 41308		RunNo: 55332					
Prep Date:	11/1/2018		Analysis Date: 11/1/2018		SeqNo: 1840996		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	10	50.00	0	86.4	70	130			
Surr: DNOP	4.6		5.000		92.6	50.6	138			

Sample ID	MB-41308	SampType:	MBLK		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	PBS	Batch ID:	41308		RunNo:	55332				
Prep Date:	11/1/2018	Analysis Date:	11/1/2018		SeqNo:	1840997		Units:	mg/Kg	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.6		10.00		96.2	50.6	138			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811004

02-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBS	Batch ID:	G55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841156	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	910		1000		91.0	73.8	119			

Sample ID	2.5UG GRO LCS	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	G55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841157	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.3	80.1	123			
Surr: BFB	1000		1000		102	73.8	119			

Sample ID	1811004-001AMS	SampType:	MS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-38	Batch ID:	G55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841158	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	210	22	111.0	98.85	104	77.8	128			
Surr: BFB	14000		4440		310	73.8	119			S

Sample ID	1811004-001AMSD	SampType:	MSD	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-38	Batch ID:	G55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841159	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	200	22	111.0	98.85	91.7	77.8	128	6.78	20	
Surr: BFB	14000		4440		307	73.8	119	0	0	S

Sample ID	B29	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBS	Batch ID:	G55334	RunNo:	55334					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841189	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	870		1000		87.1	73.8	119			

Sample ID	2.5UG GRO LCS	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	G55334	RunNo:	55334					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841190	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Detection Limit

W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811004

02-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	2.5UG GRO LCS	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	G55334	RunNo:	55334					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841190	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	5.0	25.00	0	116	80.1	123			
Surr: BFB	1100		1000		109	73.8	119			

Sample ID	1811004-011AMS	SampType:	MS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-48	Batch ID:	G55334	RunNo:	55334					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841191	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	190	21	106.3	58.37	125	77.8	128			
Surr: BFB	8900		4252		208	73.8	119			S

Sample ID	1811004-011AMSD	SampType:	MSD	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-48	Batch ID:	G55334	RunNo:	55334					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841192	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	170	21	106.3	58.37	108	77.8	128	9.89	20	
Surr: BFB	8100		4252		190	73.8	119	0	0	S

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811004

02-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	PBS	Batch ID:	B55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841173	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.95		1.000		95.0	80	120			

Sample ID	100NG BTEX LCS	SampType:	LCS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	LCSS	Batch ID:	B55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841174	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	105	77.3	128			
Toluene	1.1	0.050	1.000	0	109	79.2	125			
Ethylbenzene	1.1	0.050	1.000	0	106	80.7	127			
Xylenes, Total	3.1	0.10	3.000	0	105	81.6	129			
Surr: 4-Bromofluorobenzene	0.95		1.000		95.4	80	120			

Sample ID	1811004-002AMS	SampType:	MS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	SC-39	Batch ID:	B55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841175	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.79	0.021	0.8453	0.003762	92.6	68.5	133			
Toluene	0.81	0.042	0.8453	0.002806	95.4	75	130			
Ethylbenzene	0.80	0.042	0.8453	0.007177	93.3	79.4	128			
Xylenes, Total	2.3	0.085	2.536	0.02323	91.2	77.3	131			
Surr: 4-Bromofluorobenzene	0.84		0.8453		99.2	80	120			

Sample ID	1811004-002AMSD	SampType:	MSD	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	SC-39	Batch ID:	B55335	RunNo:	55335					
Prep Date:		Analysis Date:	11/1/2018	SeqNo:	1841176	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.77	0.021	0.8453	0.003762	91.1	68.5	133	1.56	20	
Toluene	0.79	0.042	0.8453	0.002806	93.5	75	130	1.93	20	
Ethylbenzene	0.77	0.042	0.8453	0.007177	90.8	79.4	128	2.72	20	
Xylenes, Total	2.3	0.085	2.536	0.02323	89.3	77.3	131	2.14	20	
Surr: 4-Bromofluorobenzene	0.81		0.8453		95.3	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811004

02-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID B29	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBS	Batch ID: B55334		RunNo: 55334							
Prep Date:	Analysis Date: 11/1/2018		SeqNo: 1841205		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.89		1.000		89.5	80	120			

Sample ID 100NG BTEX LCS	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: B55334		RunNo: 55334							
Prep Date:	Analysis Date: 11/1/2018		SeqNo: 1841206		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.025	1.000	0	87.6	77.3	128			
Toluene	0.94	0.050	1.000	0	94.3	79.2	125			
Ethylbenzene	0.95	0.050	1.000	0	94.5	80.7	127			
Xylenes, Total	2.9	0.10	3.000	0	96.0	81.6	129			
Surr: 4-Bromofluorobenzene	0.91		1.000		90.8	80	120			

Sample ID 1811004-012AMS	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: SC-49	Batch ID: B55334		RunNo: 55334							
Prep Date:	Analysis Date: 11/1/2018		SeqNo: 1841208		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.72	0.021	0.8540	0.01025	83.0	68.5	133			
Toluene	0.78	0.043	0.8540	0.01127	90.2	75	130			
Ethylbenzene	0.79	0.043	0.8540	0.01170	90.7	79.4	128			
Xylenes, Total	2.4	0.085	2.562	0.03134	91.6	77.3	131			
Surr: 4-Bromofluorobenzene	0.78		0.8540		91.9	80	120			

Sample ID 1811004-012AMSD	SampType: MSD		TestCode: EPA Method 8021B: Volatiles							
Client ID: SC-49	Batch ID: B55334		RunNo: 55334							
Prep Date:	Analysis Date: 11/1/2018		SeqNo: 1841209		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.70	0.021	0.8540	0.01025	80.9	68.5	133	2.57	20	
Toluene	0.77	0.043	0.8540	0.01127	88.6	75	130	1.73	20	
Ethylbenzene	0.77	0.043	0.8540	0.01170	89.2	79.4	128	1.73	20	
Xylenes, Total	2.3	0.085	2.562	0.03134	90.0	77.3	131	1.76	20	
Surr: 4-Bromofluorobenzene	0.77		0.8540		89.6	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL

Work Order Number: 1811004

RcptNo: 1

Received By: Victoria Zellar 11/1/2018 8:30:00 AM

Completed By: Erin Melendrez 11/1/2018 8:33:46 AM

Reviewed By: VVZ 11/1/18

LB: DAD 11/1/18

Victoria Zellar

Erin Melendrez

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: DAD 11/1/18

Special Handling (If applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.4	Good	Yes			
2	4.7	Good	Yes			

☐ Standard ☒ Rush Same Day

Project #: AEC Lucerne #1

Project Manager: Heather Woods

Heather Woods

Sampler: Heather Woods
 On Ice: ☒ Yes ☐ No 2 mulls
 Sample Temperature 34 mm 11/12/14/12/10/47

Container Type and #	Preservative Type	HEAL No.
		1311004

(7) 402 Glass	Non	-001
		-002
		003

-003			
-004			
-005			

-006					
-007					
-008					

110					
010					
100					

Received by:	Date	Time
<i>Christine Weber</i>	<i>10/21/18</i>	<i>1746</i>

Received by: Center Date: 11/11/18 Time: 3:30
Antonia Lopez
 VVZ 11/11/18
 11/11/18 3:30
 contracted to other accredited laboratories. This serves as notice of this

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

www.hallenvironmental.com

Tel. 505-345-3975 Fax 505-345-4107

[illegible]

Direct Bill to Hilcorp
C/o Clara Cardoza



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 12, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HEC Lucerne 1

OrderNo.: 1811502

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 5 sample(s) on 11/9/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1811502

Date Reported: 11/12/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-38R

Project: HEC Lucerne 1

Collection Date: 11/8/2018 2:00:00 PM

Lab ID: 1811502-001

Matrix: MEOH (SOIL)

Received Date: 11/9/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	11/9/2018 11:06:06 AM	41442
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/9/2018 11:06:06 AM	41442
Surr: DNOP	78.9	50.6-138		%Rec	1	11/9/2018 11:06:06 AM	41442
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	18		mg/Kg	5	11/9/2018 10:48:48 AM	41429
Surr: BFB	94.4	73.8-119		%Rec	5	11/9/2018 10:48:48 AM	41429
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.092		mg/Kg	5	11/9/2018 10:48:48 AM	41429
Toluene	ND	0.18		mg/Kg	5	11/9/2018 10:48:48 AM	41429
Ethylbenzene	ND	0.18		mg/Kg	5	11/9/2018 10:48:48 AM	41429
Xylenes, Total	ND	0.37		mg/Kg	5	11/9/2018 10:48:48 AM	41429
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	5	11/9/2018 10:48:48 AM	41429

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1811502**Date Reported: **11/12/2018****CLIENT:** Rule Engineering LLC**Client Sample ID:** SC-44R**Project:** HEC Lucerne 1**Collection Date:** 11/8/2018 2:12:00 PM**Lab ID:** 1811502-002**Matrix:** MEOH (SOIL)**Received Date:** 11/9/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	12	9.7		mg/Kg	1	11/9/2018 11:30:17 AM	41442
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	11/9/2018 11:30:17 AM	41442
Surr: DNOP	87.4	50.6-138		%Rec	1	11/9/2018 11:30:17 AM	41442
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	18		mg/Kg	5	11/9/2018 11:12:16 AM	41429
Surr: BFB	95.2	73.8-119		%Rec	5	11/9/2018 11:12:16 AM	41429
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.088		mg/Kg	5	11/9/2018 11:12:16 AM	41429
Toluene	ND	0.18		mg/Kg	5	11/9/2018 11:12:16 AM	41429
Ethylbenzene	ND	0.18		mg/Kg	5	11/9/2018 11:12:16 AM	41429
Xylenes, Total	ND	0.35		mg/Kg	5	11/9/2018 11:12:16 AM	41429
Surr: 4-Bromofluorobenzene	108	80-120		%Rec	5	11/9/2018 11:12:16 AM	41429

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1811502

Date Reported: 11/12/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-47R

Project: HEC Lucerne 1

Collection Date: 11/8/2018 2:20:00 PM

Lab ID: 1811502-003

Matrix: MEOH (SOIL)

Received Date: 11/9/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	150	9.9		mg/Kg	1	11/9/2018 11:54:36 AM	41442
Motor Oil Range Organics (MRO)	59	50		mg/Kg	1	11/9/2018 11:54:36 AM	41442
Surr: DNOP	95.1	50.6-138		%Rec	1	11/9/2018 11:54:36 AM	41442
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	56	17		mg/Kg	5	11/9/2018 11:35:49 AM	41429
Surr: BFB	205	73.8-119	S	%Rec	5	11/9/2018 11:35:49 AM	41429
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.23	0.087		mg/Kg	5	11/9/2018 11:35:49 AM	41429
Toluene	ND	0.17		mg/Kg	5	11/9/2018 11:35:49 AM	41429
Ethylbenzene	0.24	0.17		mg/Kg	5	11/9/2018 11:35:49 AM	41429
Xylenes, Total	2.4	0.35		mg/Kg	5	11/9/2018 11:35:49 AM	41429
Surr: 4-Bromofluorobenzene	116	80-120		%Rec	5	11/9/2018 11:35:49 AM	41429

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1811502

Date Reported: 11/12/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-48R

Project: HEC Lucerne 1

Collection Date: 11/8/2018 2:32:00 PM

Lab ID: 1811502-004

Matrix: MEOH (SOIL)

Received Date: 11/9/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	140	9.8		mg/Kg	1	11/9/2018 12:18:50 PM	41442
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/9/2018 12:18:50 PM	41442
Surr: DNOP	96.0	50.6-138		%Rec	1	11/9/2018 12:18:50 PM	41442
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	17		mg/Kg	5	11/9/2018 11:59:18 AM	41429
Surr: BFB	131	73.8-119	S	%Rec	5	11/9/2018 11:59:18 AM	41429
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.086		mg/Kg	5	11/9/2018 11:59:18 AM	41429
Toluene	ND	0.17		mg/Kg	5	11/9/2018 11:59:18 AM	41429
Ethylbenzene	ND	0.17		mg/Kg	5	11/9/2018 11:59:18 AM	41429
Xylenes, Total	0.53	0.35		mg/Kg	5	11/9/2018 11:59:18 AM	41429
Surr: 4-Bromofluorobenzene	112	80-120		%Rec	5	11/9/2018 11:59:18 AM	41429

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Removed by excavation -HW

Analytical Report

Lab Order 1811502

Date Reported: 11/12/2018

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC

Client Sample ID: SC-51R

Project: HEC Lucerne 1

Collection Date: 11/8/2018 2:45:00 PM

Lab ID: 1811502-005

Matrix: MEOH (SOIL)

Received Date: 11/9/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	110	9.4		mg/Kg	1	11/9/2018 12:43:08 PM	41442
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	11/9/2018 12:43:08 PM	41442
Surr: DNOP	94.4	50.6-138		%Rec	1	11/9/2018 12:43:08 PM	41442
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	180	18		mg/Kg	5	11/9/2018 12:22:50 PM	41429
Surr: BFB	363	73.8-119	S	%Rec	5	11/9/2018 12:22:50 PM	41429
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	0.20	0.089		mg/Kg	5	11/9/2018 12:22:50 PM	41429
Toluene	2.2	0.18		mg/Kg	5	11/9/2018 12:22:50 PM	41429
Ethylbenzene	0.98	0.18		mg/Kg	5	11/9/2018 12:22:50 PM	41429
Xylenes, Total	13	0.36		mg/Kg	5	11/9/2018 12:22:50 PM	41429
Surr: 4-Bromofluorobenzene	118	80-120		%Rec	5	11/9/2018 12:22:50 PM	41429

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811502

12-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	LCS-41442		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 41442		RunNo: 55532					
Prep Date:	11/9/2018		Analysis Date: 11/9/2018		SeqNo: 1849517		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.1	70	130			
Surr: DNOP	4.2		5.000		84.6	50.6	138			

Sample ID	MB-41442		SampType:	MBLK		TestCode:	EPA Method 8015M/D: Diesel Range Organics				
Client ID:	PBS		Batch ID:	41442		RunNo:	55532				
Prep Date:	11/9/2018		Analysis Date:	11/9/2018		SeqNo:	1849518		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Diesel Range Organics (DRO)	ND	10									
Motor Oil Range Organics (MRO)	ND	50									
Surr: DNOP	8.3		10.00		83.0	50.6	138				

Sample ID	1811502-005AMS		SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-51R		Batch ID: 41442		RunNo: 55532					
Prep Date:	11/9/2018		Analysis Date: 11/9/2018		SeqNo: 1849779		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	140	9.7	48.50	107.4	58.7	53.5	126			
Surr: DNOP	3.5		4.850		72.6	50.6	138			

Sample ID	1811502-005AMSD		SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SC-51R		Batch ID: 41442		RunNo: 55532					
Prep Date:	11/9/2018		Analysis Date: 11/9/2018		SeqNo: 1849780		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	150	9.8	48.83	107.4	79.1	53.5	126	7.18	21.7	
Surr: DNOP	4.6		4.883		95.0	50.6	138	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811502

12-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	MB-41429		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	PBS		Batch ID: 41429		RunNo: 55537					
Prep Date:	11/8/2018		Analysis Date: 11/9/2018		SeqNo: 1850020		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	900		1000		90.5	73.8	119			

Sample ID	LCS-41429		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range					
Client ID:	LCSS		Batch ID: 41429		RunNo: 55537					
Prep Date:	11/8/2018		Analysis Date: 11/9/2018		SeqNo: 1850021		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	108	80.1	123			
Surr: BFB	1100		1000		110	73.8	119			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811502

12-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	MB-41429		SampType: MBLK		TestCode: EPA Method 8021B: Volatiles					
Client ID:	PBS		Batch ID: 41429		RunNo: 55537					
Prep Date:	11/8/2018		Analysis Date: 11/9/2018		SeqNo: 1850035		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		104	80	120			

Sample ID	LCS-41429		SampType: LCS		TestCode: EPA Method 8021B: Volatiles					
Client ID:	LCSS		Batch ID: 41429		RunNo: 55537					
Prep Date:	11/8/2018		Analysis Date: 11/9/2018		SeqNo: 1850036		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	92.0	80	120			
Toluene	0.95	0.050	1.000	0	95.2	80	120			
Ethylbenzene	0.97	0.050	1.000	0	96.8	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.9	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: **RULE ENGINEERING LL**

Work Order Number: **1811502**

RcptNo: **1**

Received By: **Victoria Zellar**

11/9/2018 8:00:00 AM

Victoria Zellar

Completed By: **Ashley Gallegos**

11/9/2018 8:36:59 AM

Ashley Gallegos

Reviewed By: **ENM**

11/9/18

Labeled by: **DAD 11/09/18**

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: _____

(<2 or >12 unless noted)

Adjusted? _____

Checked by: **DAD 11/09/18**

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.7	Good	Yes			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 26, 2018

Heather Woods

Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HEC Lucerne 1

OrderNo.: 1811B21

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 4 sample(s) on 11/21/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1811B21

Date Reported: 11/26/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-47 (11/20/18)

Project: HEC Lucerne 1

Collection Date: 11/20/2018 9:10:00 AM

Lab ID: 1811B21-001

Matrix: SOIL

Received Date: 11/21/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	29	9.9		mg/Kg	1	11/21/2018 10:14:19 AM	41674
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/21/2018 10:14:19 AM	41674
Surr: DNOP	105	50.6-138		%Rec	1	11/21/2018 10:14:19 AM	41674
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	19		mg/Kg	5	11/21/2018 9:34:01 AM	G55809
Surr: BFB	101	73.8-119		%Rec	5	11/21/2018 9:34:01 AM	G55809
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.093		mg/Kg	5	11/21/2018 9:34:01 AM	B55809
Toluene	ND	0.19		mg/Kg	5	11/21/2018 9:34:01 AM	B55809
Ethylbenzene	ND	0.19		mg/Kg	5	11/21/2018 9:34:01 AM	B55809
Xylenes, Total	ND	0.37		mg/Kg	5	11/21/2018 9:34:01 AM	B55809
Surr: 4-Bromofluorobenzene	92.4	80-120		%Rec	5	11/21/2018 9:34:01 AM	B55809

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1811B21

Date Reported: 11/26/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-48 (11/20/18)

Project: HEC Lucerne 1

Collection Date: 11/20/2018 9:23:00 AM

Lab ID: 1811B21-002

Matrix: SOIL

Received Date: 11/21/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: irm
Diesel Range Organics (DRO)	16	9.8		mg/Kg	1	11/21/2018 10:36:12 AM	41674
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/21/2018 10:36:12 AM	41674
Surr: DNOP	103	50.6-138		%Rec	1	11/21/2018 10:36:12 AM	41674
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	20		mg/Kg	5	11/21/2018 9:56:56 AM	G55809
Surr: BFB	92.7	73.8-119		%Rec	5	11/21/2018 9:56:56 AM	G55809
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.099		mg/Kg	5	11/21/2018 9:56:56 AM	B55809
Toluene	ND	0.20		mg/Kg	5	11/21/2018 9:56:56 AM	B55809
Ethylbenzene	ND	0.20		mg/Kg	5	11/21/2018 9:56:56 AM	B55809
Xylenes, Total	ND	0.40		mg/Kg	5	11/21/2018 9:56:56 AM	B55809
Surr: 4-Bromofluorobenzene	94.2	80-120		%Rec	5	11/21/2018 9:56:56 AM	B55809

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1811B21

Date Reported: 11/26/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-51 (11/20/18)

Project: HEC Lucerne 1

Collection Date: 11/20/2018 9:35:00 AM

Lab ID: 1811B21-003

Matrix: SOIL

Received Date: 11/21/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: irm
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	11/21/2018 10:58:15 AM	41674
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/21/2018 10:58:15 AM	41674
Surr: DNOP	107	50.6-138		%Rec	1	11/21/2018 10:58:15 AM	41674
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	22		mg/Kg	5	11/21/2018 10:19:45 AM	G55809
Surr: BFB	92.9	73.8-119		%Rec	5	11/21/2018 10:19:45 AM	G55809
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.11		mg/Kg	5	11/21/2018 10:19:45 AM	B55809
Toluene	ND	0.22		mg/Kg	5	11/21/2018 10:19:45 AM	B55809
Ethylbenzene	ND	0.22		mg/Kg	5	11/21/2018 10:19:45 AM	B55809
Xylenes, Total	ND	0.44		mg/Kg	5	11/21/2018 10:19:45 AM	B55809
Surr: 4-Bromofluorobenzene	93.5	80-120		%Rec	5	11/21/2018 10:19:45 AM	B55809

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1811B21

Date Reported: 11/26/2018

CLIENT: Rule Engineering LLC

Client Sample ID: SC-52 (11/20/18)

Project: HEC Lucerne 1

Collection Date: 11/20/2018 9:48:00 AM

Lab ID: 1811B21-004

Matrix: SOIL

Received Date: 11/21/2018 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: IRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	11/21/2018 11:20:13 AM	41674
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	11/21/2018 11:20:13 AM	41674
Surr: DNOP	105	50.6-138		%Rec	1	11/21/2018 11:20:13 AM	41674
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	20		mg/Kg	5	11/21/2018 10:42:31 AM	G55809
Surr: BFB	87.0	73.8-119		%Rec	5	11/21/2018 10:42:31 AM	G55809
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.10		mg/Kg	5	11/21/2018 10:42:31 AM	B55809
Toluene	ND	0.20		mg/Kg	5	11/21/2018 10:42:31 AM	B55809
Ethylbenzene	ND	0.20		mg/Kg	5	11/21/2018 10:42:31 AM	B55809
Xylenes, Total	ND	0.41		mg/Kg	5	11/21/2018 10:42:31 AM	B55809
Surr: 4-Bromofluorobenzene	88.5	80-120		%Rec	5	11/21/2018 10:42:31 AM	B55809

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811B21

26-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	LCS-41674		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 41674		RunNo: 55806					
Prep Date:	11/21/2018		Analysis Date: 11/21/2018		SeqNo: 1861020		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	56	10	50.00	0	112	70	130			
Surr: DNOP	4.6		5.000		91.6	50.6	138			

Sample ID	MB-41674		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 41674		RunNo: 55806					
Prep Date:	11/21/2018		Analysis Date: 11/21/2018		SeqNo: 1861021		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.7		10.00		96.8	50.6	138			

Sample ID	LCS-41655		SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS		Batch ID: 41655		RunNo: 55806					
Prep Date:	11/20/2018		Analysis Date: 11/21/2018		SeqNo: 1861167		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.2		5.000		83.7	50.6	138			

Sample ID	MB-41655		SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS		Batch ID: 41655		RunNo: 55806					
Prep Date:	11/20/2018		Analysis Date: 11/21/2018		SeqNo: 1861168		Units: %Rec			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.7		10.00		86.9	50.6	138			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811B21

26-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBS	Batch ID:	G55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861271	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	930		1000		92.7	73.8	119			

Sample ID	2.5UG GRO LCS	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	G55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861272	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.1	80.1	123			
Surr: BFB	1100		1000		106	73.8	119			

Sample ID	1811B21-001AMS	SampType:	MS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-47 (11/20/18)	Batch ID:	G55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861273	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	100	19	92.72	7.418	105	77.8	128			
Surr: BFB	4200		3709		113	73.8	119			

Sample ID	1811B21-001AMSD	SampType:	MSD	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	SC-47 (11/20/18)	Batch ID:	G55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861274	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	100	19	92.72	7.418	102	77.8	128	2.52	20	
Surr: BFB	4100		3709		111	73.8	119	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1811B21

26-Nov-18

Client: Rule Engineering LLC

Project: HEC Lucerne 1

Sample ID	RB	SampType:	MBLK	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	PBS	Batch ID:	B55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861315	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.94		1.000		94.4	80	120			

Sample ID	100NG BTEX LCS	SampType:	LCS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	LCSS	Batch ID:	B55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861316	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	98.3	80	120			
Toluene	1.0	0.050	1.000	0	100	80	120			
Ethylbenzene	0.99	0.050	1.000	0	99.2	80	120			
Xylenes, Total	3.0	0.10	3.000	0	99.0	80	120			
Surr: 4-Bromofluorobenzene	0.92		1.000		91.8	80	120			

Sample ID	1811B21-002AMS	SampType:	MS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	SC-48 (11/20/18)	Batch ID:	B55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861317	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3.9	0.099	3.959	0.01516	98.8	63.9	127			
Toluene	4.1	0.20	3.959	0.02546	103	69.9	131			
Ethylbenzene	4.1	0.20	3.959	0	103	71	132			
Xylenes, Total	12	0.40	11.88	0.05071	103	71.8	131			
Surr: 4-Bromofluorobenzene	3.9		3.959		98.1	80	120			

Sample ID	1811B21-002AMSD	SampType:	MSD	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	SC-48 (11/20/18)	Batch ID:	B55809	RunNo:	55809					
Prep Date:		Analysis Date:	11/21/2018	SeqNo:	1861318	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3.9	0.099	3.959	0.01516	97.2	63.9	127	1.64	20	
Toluene	4.0	0.20	3.959	0.02546	101	69.9	131	1.41	20	
Ethylbenzene	4.0	0.20	3.959	0	101	71	132	1.49	20	
Xylenes, Total	12	0.40	11.88	0.05071	101	71.8	131	1.73	20	
Surr: 4-Bromofluorobenzene	3.8		3.959		96.9	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: **RULE ENGINEERING LL**

Work Order Number: **1811B21**

RcptNo: **1**

Received By: **Anne Thorne**

11/21/2018 8:30:00 AM

Anne Thorne

Completed By: **Anne Thorne**

11/21/2018 8:36:04 AM

Anne Thorne

Reviewed By:

JAB 11/21/18

labeled by: AT 11/21/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐

2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐

4. Were all samples received at a temperature of >0° C to 6.0° C Yes ☒ No ☐ NA ☐

5. Sample(s) in proper container(s)? Yes ☒ No ☐

6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐

7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐

8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐

9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒

10. Were any sample containers received broken? Yes ☐ No ☒

11. Does paperwork match bottle labels? Yes ☒ No ☐

(Note discrepancies on chain of custody)

12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐

13. Is it clear what analyses were requested? Yes ☒ No ☐

14. Were all holding times able to be met? Yes ☒ No ☐

(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Yes			

