STAGE 1 ABATEMENT PLAN

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO

AP-126 pJEG1821432884

NMOCD

DEC 05 2018

DISTRICT III

NOVEMBER 30, 2018

Prepared for:

MS. JENNIFER DEAL
HILCORP ENERGY COMPANY
382 Road 3100
Aztec, New Mexico 87410

Prepared by:

LT ENVIRONMENTAL, INC.
848 East Second Avenue
Durango, Colorado 81301
970.385.1096

LT Environmental, Inc.
Advancing Opportunity

STAGE 1 ABATEMENT PLAN

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO

Project Number: 017817006

Prepared by: _____ November 30, 2018

Danny Burns
LTE Project Geologist

Date

Reviewed by: _____ November 30, 2018

Ashley Ager, M.S., P.G.
LTE Senior Geologist

Date

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

STAGE 1 ABATEMENT PLAN

LT Environmental, Inc. (LTE), on behalf of Hilcorp Energy Company (Hilcorp), presents the following Stage 1 Abatement Plan (AP-126-0) associated with subsurface hydrocarbon impacts encountered at the Standard #1 natural gas production well (Site). This plan details the site description and background, initial response and assessment, and site geologic and hydrologic characteristics. The plan proposes additional monitoring and delineation activities and provides a proposed schedule for completion of those activities with subsequent submittal of a Stage 2 Abatement Plan per New Mexico Administrative Code (NMAC) 19.15.30.

1.0 SITE DESCRIPTION AND BACKGROUND

The Site is located on Crouch Mesa between the Animas and San Juan rivers in Unit J of Section 4 of Township 29 North, Range 12 West, San Juan County, New Mexico, approximately 3 miles southwest of Flora Vista (Figure 1). The Site is an active natural gas production facility consisting of a production wellhead, three-phase separator, a below-grade produced water storage tank, and an aboveground condensate storage tank. On November 28, 2017, the Site was shut in during construction activities when subsurface hydrocarbon impacts were encountered from a suspected historical release from a production dump line. The dump line transported condensate and produced water from the separator to an aboveground storage tank. The duration and volume of the release is unknown. The release was reported to the New Mexico Oil Conservation Division (NMOCD) by Hilcorp on a Form C-141 *Release Notification and Corrective Action Form* dated December 6, 2017.

1.1 Regional Geology and Hydrology

The area is regionally described as Nacimiento Formation at the surface that grades into the Animas Formation to the West. The lower portion of the Nacimiento Formation is composed of interbedded black, carbonaceous mudstones and white coarse-grained sandstones. The upper part is comprised of mudstone and sandstone. It is generally slope-forming, even within the sandstone units. Aquifers within the coarser and continuous sandstone bodies of the Nacimiento Formation are between 0 and 1,000 feet deep in the San Juan Basin. The 1,000-foot depth range for aquifers covers an area over 20 miles wide and depth decreases towards the margins of the San Juan Basin. The Site in question is more centrally located, and depth to the aquifer is expected to be closer to 200 feet to 500 feet below ground surface (bgs) (Stone et al., 1983). It is well known that groundwater close to the Animas River is shallow, as the Quaternary deposits associated with the Animas River form shallow aquifers. However, the Site is greater than a mile and a half southeast of the Animas River and almost 400 feet higher in elevation.

Local stratigraphy at the Site is based on observations from excavation and subsurface drilling. It consists of graded fill over approximately 6 feet of grayish-brown gravely sand. Cobbles are present from 6 feet to approximately 25 feet bgs. The cobbles are tightly situated in an unconsolidated silty to sandy matrix. Moisture was identified within the cobbles at approximately 23 feet bgs. The cobbles rest on a thin, (less than 1 foot thick), friable, dark greenish-gray clay that is wet. Beneath the thin clay at approximately 26 feet bgs is a tan to grayish-brown claystone that is dry. The greenish-gray clay and underlying claystone likely represent the top of the Nacimiento Formation and the cobbles above are a younger terrace deposit associated with the historic Animas River. The less erosive cobble deposit would explain the higher topographic elevation of the Site as related to slope-forming Nacimiento outcrops along the flanks of Crouch Mesa. Limited water is present at the interface between the cobbles and thin clay, but the water does not extend into the shale beneath the clay.

1.2 Land and Water Use

Land use surrounding the Site consists of natural gas development, a gravel pit, unused land, and residential housing. The nearest residence is located approximately 1,107 feet northwest of the Site. The shallow water encountered during excavation and drilling is not associated with existing beneficial use and is not mentioned in publications describing local aquifers. The closest permitted water well is SJ 01031, located approximately 2,988 feet north of the Site with a depth to water of 172 feet and a total

depth of 275 feet bgs. There are six additional water wells within one mile of the Site. Depth to groundwater ranges from 155 feet to 310 feet bgs. The nearest identified significant surface water feature is an unnamed arroyo approximately 2,065 feet to the north of the Site. This surface hydrological feature appears to be a third-order tributary of the Animas River. No impact to surface water has been identified and based on the distance and the geological characteristics of the Site, potential impact to any surface water is unlikely.

1.3 Initial Response

Hilcorp conducted a preliminary hand auger investigation and initiated excavation activities to mitigate subsurface impact. Based on the estimated proximity to potential receptors at the time the release was discovered, Hilcorp ranked the Site a zero, according to the NMOCD 1993 *Guidelines for Remediation of Spills, Leaks, and Releases*. In accordance with that site ranking, Hilcorp's excavation progress was based on a remediation action level of 5,000 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons (TPH). Soil confirmation samples were collected from the excavation sidewalls as soil was removed, and portions of the excavation were backfilled, with approval from the NMOCD, when sample results indicated the remediation action levels for TPH and benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations had been met. Samples collected from the base of the excavation continued to exceed remediation action levels for TPH and the excavation was advanced vertically. Subsequently, Hilcorp encountered saturated sediment at approximately 25 feet bgs, significantly shallower than the estimated depth to groundwater of greater than 100 feet and deeper than the established existing local aquifer from which beneficial use is acquired. The accumulation of fluid, consisting of water and phase separated hydrocarbon (PSH), significantly altered remediation progress and planning. The site ranking increased to 20, thereby decreasing the TPH remediation action level in soil to 100 mg/kg. Hilcorp ultimately excavated approximately 1,400 cubic yards of impacted soil, the extent of which is included on Figure 2; however, excavation activities ceased so that additional investigation could be conducted to determine lateral extent of the impact to soil and/or groundwater.

1.4 Local Geology and Hydrology

A small pothole in the middle of the excavation was excavated to observe fluid conditions (Figure 2). The pothole did not immediately fill in with water, so LTE collected a sample of the claystone beneath the wet clay, crushed it, and submitted it for laboratory analysis of BTEX and TPH. The goal was to document a clean horizon beneath the impact for vertical delineation. Results confirmed the bedrock beneath the water-bearing unit was not impacted by the release (Table 1, soil sample BR-1). The claystone appeared to represent vertical delineation of the release and an aquitard, preventing vertical migration of observed water deeper into the subsurface.

The water was allowed to accumulate in the pothole at the bottom of the excavation for two days, then a vacuum truck recovered the water to calculate recharge rates and collect a representative sample. Approximately one-half inch of PSH was observed on the water. LTE used a clean, unused, and open-top sample bottle connected to disposable rope on a wooden pole to collect a water sample on May 15, 2018. LTE transferred the sample from the sample "cup" into laboratory provided sample vials for analysis of BTEX. LTE collected a second sample on May 16, 2018 to be analyzed for total dissolved solids (TDS). Free-phase product was observed during sampling, but additional recovery was successful in removing the free-phase product to allow for water sample collection. Laboratory analytical results are presented on Table 2 and demonstrate that benzene, toluene, total xylenes, and TDS exceeded New Mexico Water Quality

Control Commission (NMWQCC) standards in the water sample. Water quality results and presence of PSH suggested at least a portion of the water volume is sourced from the historical pipeline release.

After removing approximately 75 barrels (bbls) of water over 9 recovery events, Hilcorp allowed water to accumulate for three days in advance of another sampling event, which was conducted in the presence of the NMOCD. LTE collected a sample according to the methods described above on June 12, 2018. The sample was analyzed for BTEX, conductivity, sulfate, and chloride. Laboratory analytical results are presented on Table 2 and indicate benzene, toluene, and total xylenes exceeded remediation action levels. Conductivity and chloride were also elevated.

There were no nearby sources of background water to sample and compare water quality results; however, LTE did collect a sample of produced water at a nearby production well (Walker #1). While significant concentrations of BTEX were not detected in the produced water, conductivity, chloride, and TDS concentrations were elevated and detected at similar ratios to the results for the excavation water (Sample PW01 on Table 2). It is possible that the source of some of the water observed and recovered from the excavation is the released fluids from the pipeline.

Prior to water sampling on June 12, 2018, Hilcorp estimated the total volume of liquid in the excavation pothole was 701 gallons with a ½-inch accumulation, or 15.6 gallons, of PSH on top of the water. Based on the vacuum truck recovery volumes, LTE estimated water accumulated in the excavation pothole at approximately 7 to 14 gallons per hour. The slow recharge rate and lack of vertical migration suggests the water-bearing unit is not conducive to significant water storage or flow. Water migrated swiftly though the porous cobbles and collected on the clay-bedrock interface, where a small volume of water is stored due to the confining properties of the underlying shale. Based on Fetter (2001), a default value for hydraulic conductivity of the clay is assigned to be 10^{-9} to 10^{-6} centimeters per second (cm/s), which is equivalent to approximately 0.003 feet per day; a low value associated with the lack of permeability in the clay. Assuming hydraulic conductivity of 10^{-6} cm/s and a saturated thickness of 1 foot, a transmissivity of 0.0212 gallons per day per foot is estimated. In general, transmissivities greater than 0.37 gallons per day per foot represent good aquifers for domestic water well use (Freeze et. al, 1979); more is required for industrial, agricultural, and recreational use.

2.0 SITE CHARACTERIZATION

Based on site assessment activities, depth to groundwater at the Site is less than 50 feet below ground surface (bgs). Therefore, the following remediation action levels apply for soil according to 19.15.29 NMAC dated August 14, 2018: 10 mg/kg benzene; 50 mg/kg total BTEX; 100 mg/kg TPH; and 600 mg/kg chloride. Additionally, the following New Mexico Water Quality Control Commission (NMWCC) standards apply to groundwater: 10 µg/l benzene, 750 µg/l toluene, 750 µg/l ethylbenzene, and 620 µg/l total xylenes.

In August and October 2018, LTE conducted soil and groundwater assessment activities at the Site. A variety of drilling techniques were used during assessment activities in order to penetrate and characterize the dense cobble lithology including: hollow-stem auger, air rotary, ODEX, and sonic. A total of 14 boreholes were advanced at the Site ranging from 25 feet to 45 feet bgs. Soil borings were advanced in each cardinal direction outside of the known impacted area and then laterally to define field-identified subsurface hydrocarbon impacts. The soil borings were logged by an LTE geologist who inspected the soil for the presence or absence of petroleum hydrocarbon odor and/or staining. The soil was characterized by visually inspecting the soil samples and field screening the soil headspace using a photo-ionization detector (PID) to monitor for the presence of volatile organic vapors. Two soil samples from each soil boring were submitted for laboratory analysis: the most impacted sample based on field screening techniques and the terminus of the borehole. Groundwater monitoring wells were constructed in each borehole by installing screened casing across the groundwater interface and solid casing to surface. Wells were constructed out of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 2-inch Schedule 40 PVC 0.010-inch slotted screen. Wells were completed with 10-20 silica sand pack to two feet above the screened interval, then two feet of hydrated bentonite seal, and then bentonite-cement slurry grout to ground surface. The wells were completed aboveground with a locking, steel protective casing cemented into the ground. Borehole locations are depicted on Figure 2. Soil boring logs are included as Appendix A.

Following well construction, monitoring wells were developed using a disposable bailer. Fluid-level measurements were collected using an oil/water interface probe. During well development, ten well casing volumes of groundwater were removed from each monitoring well or the well was purged dry. At least 24 hours after development, groundwater samples were collected using disposable bailers from monitoring wells MW02, MW10, MW11, MW12, and MW14. During well development activities, PSH was observed in monitoring wells MW01 and MW06 with measured thicknesses of 0.15 ft and 0.33 ft, respectively. Due to the presence of PSH in MW01 and MW06, no groundwater samples were collected. Monitoring well MW05 did not contain a sufficient volume of water and monitoring wells MW03, MW04, MW07, MW08, MW09, and MW13 were dry. Therefore, no samples could be collected at these locations.

Soil samples were submitted for laboratory analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021 and TPH-gasoline range organics (GRO), TPH-diesel range organics (DRO), and TPH-motor oil range organics (MRO) by USEPA Method 8015. Groundwater samples were submitted for laboratory analysis of BTEX by USEPA Method 8260. All samples collected were placed on ice to maintain a temperature of approximately 4 degrees Celsius (°C) and sealed in a cooler for delivery to Hall Environmental Analysis Laboratory (Hall), of Albuquerque, New Mexico, for analysis. Samples were labeled with the date and time of collection, sample name, sampler's name, and parameters to be analyzed. Strict chain-of-custody procedures were documented including the date and time sampled, sample number, type of sample, sampler's name and signature, preservative used, and analyses required.

2.1 Results

Laboratory analytical results of soil samples indicate total BTEX concentrations exceeded the NMOCD remediation action level in soil samples MW06 @ 21'-23' and MW12 @ 17'-19' with concentrations of 86.4 mg/kg and 83.7 mg/kg, respectively. Additionally, TPH concentrations exceeded the NMOCD remediation action level in soil borings MW01, MW03, MW04, MW06, MW09, MW10, and MW12 with concentrations ranging from 129.9 mg/kg (MW03 @ 30'-32') to 1,430 mg/kg (MW12 @ 17'-19'). All other samples collected were below laboratory detection limits for the listed parameters. The soil analytical results as compared to the NMOCD remediation action levels are presented in Figure 2 and Table 1. The laboratory analytical reports are included as Appendix B.

Laboratory analytical results of groundwater samples indicate BTEX concentrations exceeded the NMWQCC standards in MW02, MW10, MW12, and MW14. All BTEX concentrations in MW11 were below laboratory detection limits. The groundwater analytical results as compared to the NMWQCC standards are presented on Figure 3 and summarized in Table 2. The laboratory analytical reports are included as Appendix B.

Depth to groundwater ranged from 19.89 feet below top of casing (btoc) (MW11) to 32.26 feet btoc (MW10). During the groundwater sampling event, PSH was observed in monitoring wells MW01 and MW06 with measured thicknesses of 0.17 ft and 0.4 ft, respectively, during the sampling event. Based on topography, initial data, and regional groundwater trends, the generalized groundwater flow direction is to the northwest, towards the Animas River. However, initial data suggests groundwater flow is relatively flat at the well pad, situated on a potentiometric high that falls off in several directions with distance from the well pad (Figure 3). Groundwater at the Site is discontinuous as evidence by lack of groundwater in several monitoring wells. At this time, LTE is unable to determine what controls accumulation of water in the monitoring wells. Water may even accumulate in monitoring wells as a result of the introduction of a borehole conduit in the subsurface. Based on this unknown and the lack of full delineation of soil and groundwater impacts, additional data points are needed to evaluate remediation options.

3.0 PROPOSED ADDITIONAL DELINEATION

LTE proposes to install at least seven additional soil borings by sonic drilling at the Site to continue delineation of the identified hydrocarbon subsurface impacts. The soil borings will be logged by an LTE geologist who will inspect the soil for the presence or absence of petroleum hydrocarbon odor and/or staining. The soil will be characterized by visually inspecting the soil samples and field screening the soil headspace using a PID to monitor for the presence of volatile organic vapors. Two soil samples from each soil boring will be submitted for laboratory analysis: the most impacted sample based on field screening techniques and the terminus of the borehole. Soil samples will be submitted for analysis of BTEX by USEPA 8021 and TPH-GRO, TPH-DRO, and TPH-MRO by USEPA Method 8015. If groundwater is encountered, monitoring wells will be constructed by installing screened casing across the groundwater interface and solid casing to surface. Upon completion of additional boreholes, groundwater monitoring wells will be developed and tied into the existing survey data. To develop the wells, depth to water will be measured and ten casing volumes will be purged or until dry. At least 48 hours after development, the new groundwater monitoring wells will be sampled with a disposable bailer after three casing volumes have been purged. Groundwater samples will be submitted for analysis of BTEX by USEPA Method 8260. Proposed borehole locations are depicted on Figure 3. Additional borings and monitoring wells will be installed as needed based on field observations to complete delineation of the identified impacts. Prior to drilling activities, all additional proposed borehole locations will be permitted with the New Mexico Office of the State Engineer (NMOSE).

3.1 Proposed Groundwater Monitoring

LTE is proposing quarterly groundwater monitoring at the Site beginning when the additional monitoring wells are installed. Existing monitoring wells will be sampled concurrently with new monitoring wells. Fluid-level measurements will be monitored in all wells using an oil/water interface probe. Based on fluid-level measurements, wells containing sufficient groundwater will be purged and sampled. Each well will be purged of three well casing volumes or until the well is purged dry. Groundwater samples will be collected from each monitoring and submitted for laboratory analysis of BTEX by USEPA 8260. Wells with measurable PSH will not be sampled.

3.2 Quality Assurance

Sampling and analytical techniques have been identified in the text above and conforms with the references identified in Subsection B of 20.6.2.3107 NMAC and with 20.6.4.14 NMAC of the water quality standards for interstate and intrastate surface waters in New Mexico.

3.3 Proposed Schedule

The additional delineation activities are proposed for the first quarter of 2019. The limited availability of sonic drill rigs and public notice will dictate the drilling date. Hilcorp will provide Public Notice within 15 days of notice from NMOCD that this Abatement Plan is administratively complete as required per NMAC 19.15.30.15. Hilcorp has submitted a proposed public notice and participation plan under separate cover. If no public comments are received within 30 days of posting public notice, LTE will proceed with permitting and scheduling additional delineation drilling. Prior to any field work, LTE and/or Hilcorp will provide the NMOCD with 48-hour notification.

Following additional delineation activities, LTE will assess and present the results to the NMOCD in a supplemental report to the Stage 1 Abatement Plan. If the subsurface impacts are fully defined, and the geology and hydrology are fully understood after the second round of site assessment activities, LTE will design and submit remediation options as part of the Stage 2 Abatement Plan for approval from the NMOCD within 60 days of the director's approval of the final site investigation report per NMAC 19.15.30.13.D (1).

LTE appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this Stage 1 Abatement Plan, do not hesitate to contact Danny Burns at (970) 385-1096 or via email at dburns@ltenv.com or Jennifer Deal at (505) 324-5128 or at jdeal@hilcorp.com.

4.0 REFERENCES

Fetter, C.W., 2001, *Applied Hydrogeology*, 592 p.

Freeze, R.A., Cherry, J.A., 1979, *Physical Properties and Principals: Groundwater*, Prentice Hall, Englewood Cliffs, NJ, pp. 15-79.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizell, N.H., and Padgett, E.T., 1983, *Hydrogeology and Water Resources of the San Juan Basin, New Mexico*, New Mexico Bureau of Mines and Mineral Resources Hydrologic Report 6, 70 p.

FIGURES

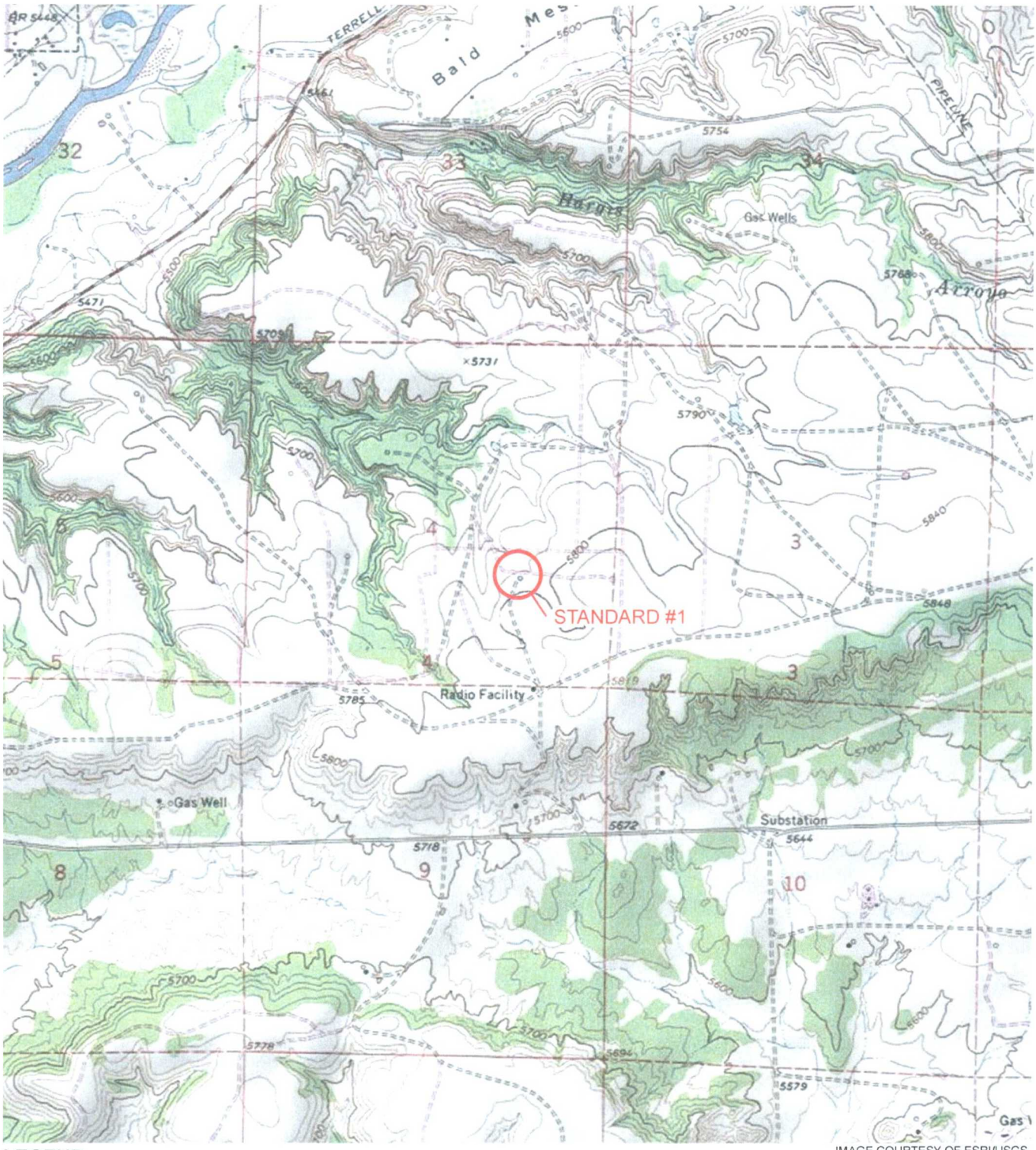


IMAGE COURTESY OF ESRI/USGS

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

NEW MEXICO

FIGURE 1
SITE LOCATION MAP
STANDARD #1
SE SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG01_SL.mxd

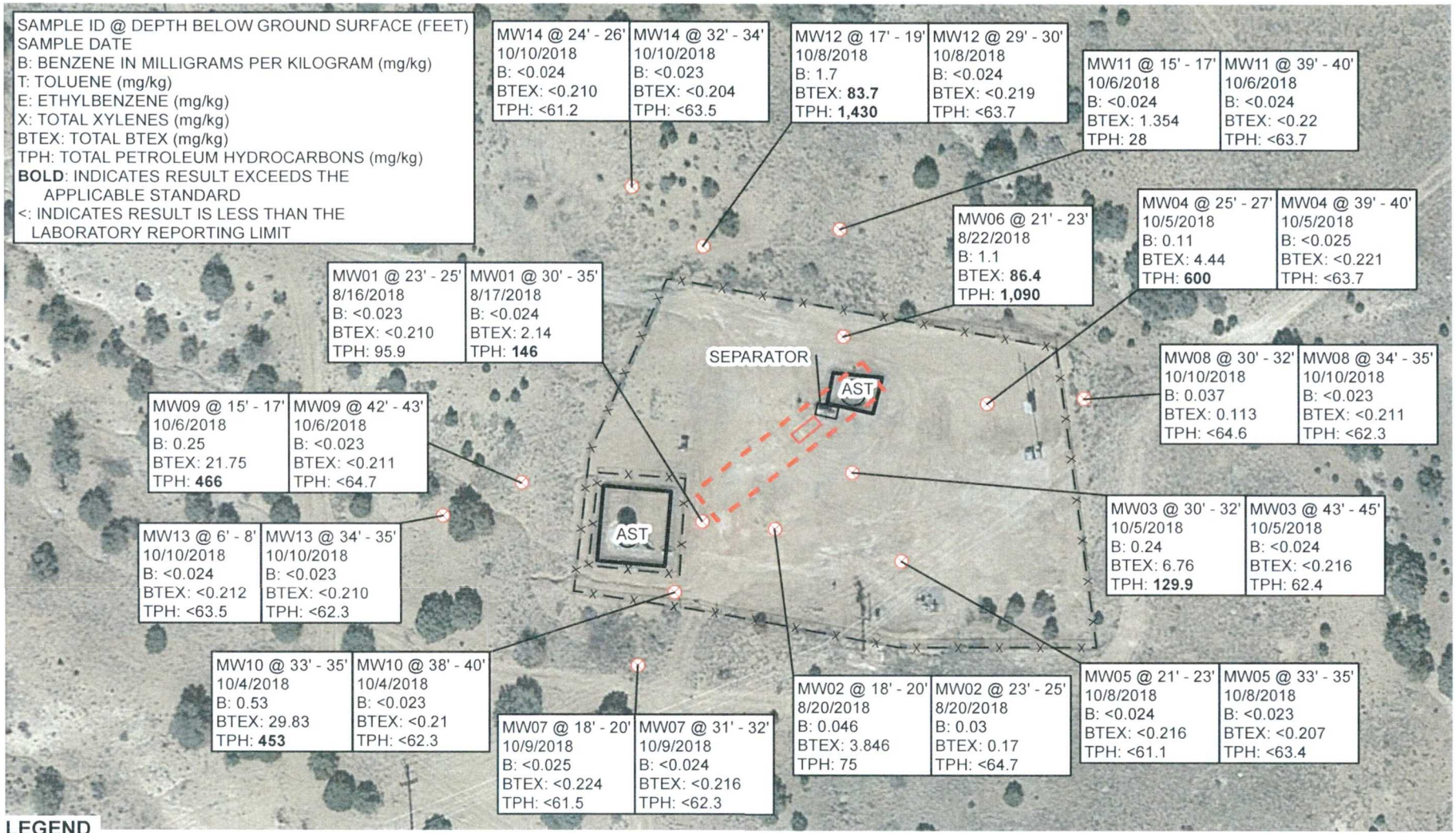


IMAGE COURTESY OF GOOGLE EARTH 2015

ONLY LABORATORY ANALYTICAL RESULTS EXCEEDING NEW MEXICO OIL CONSERVATION DIVISION REMEDIATION ACTION LEVELS ARE PRESENTED. A FULL PRESENTATION OF RESULTS ARE ON TABLE 2.

FIGURE 2
SOIL ANALYTICAL RESULTS
STANDARD #1
SE SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG01_SOIL_ANALY_AUG_OCT_2018.mxd

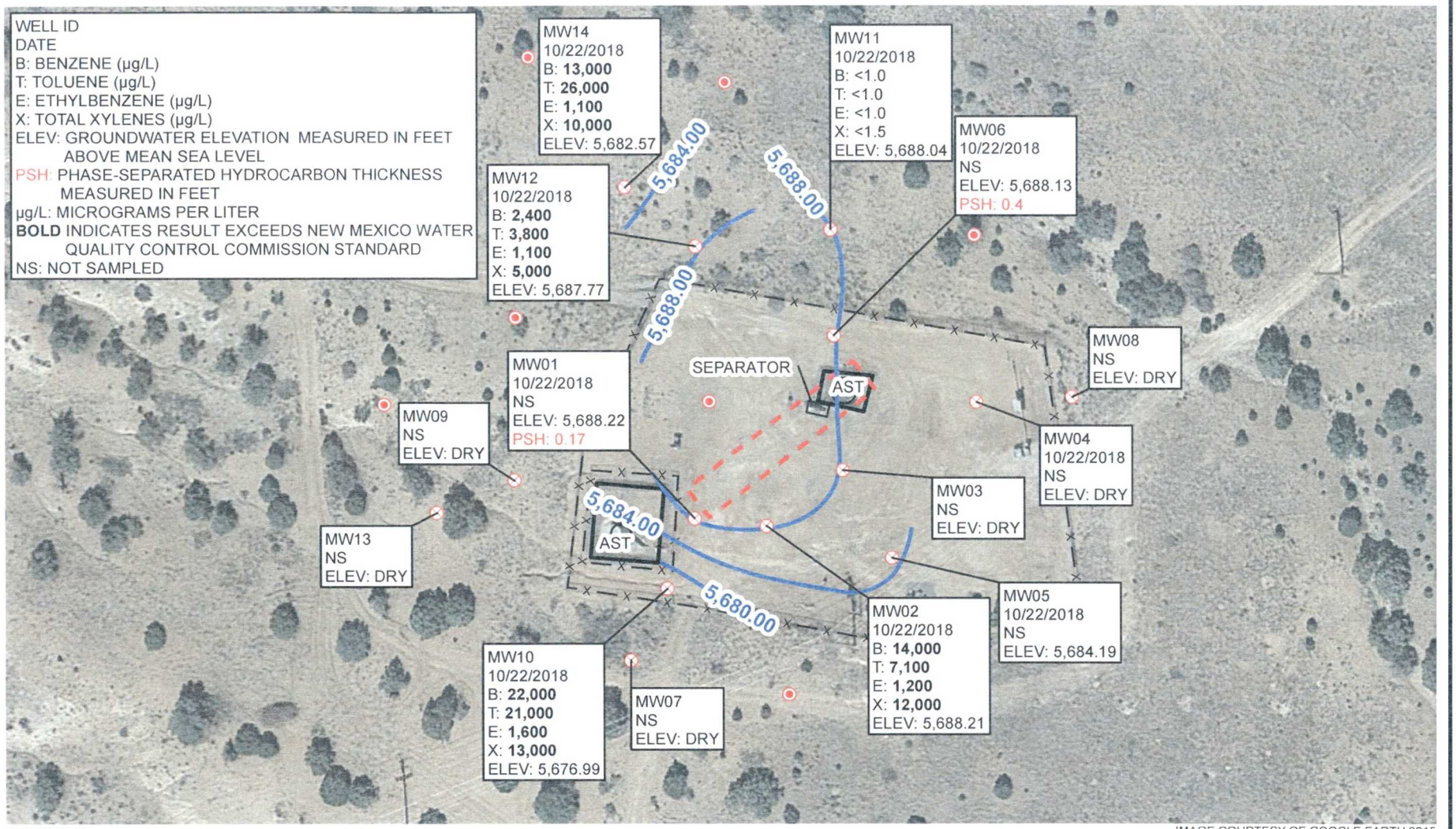


IMAGE COURTESY OF GOOGLE EARTH 2015

LEGEND

- EXISTING INSTALLED MONITORING WELL
- PROPOSED SOIL BORING
- FENCE
- INFERRED GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 4.0 FEET
- REMEDIATION EXCAVATION EXTENT
- BERM
- AST: ABOVEGROUND STORAGE TANK

0 80 160
Feet

N

FIGURE 3
GROUNDWATER ANALYTICAL RESULTS
STANDARD #1
SE SEC 4 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017817006_STANDARD 1\017817006_FIG03_GWA_GWE_OCT_2018_181130.mxd

TABLES

TABLE 1
SOIL ANALYTICAL RESULTS

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
BR-1	5/7/2018	NA	0.053	<0.041	<0.041	0.11	0.163	<4.1	<10	<50	<64.1
MW01 @ 23' - 25'	8/16/2018	111	<0.023	<0.047	<0.047	<0.093	<0.210	9.9	16	70	95.9
MW01 @ 30' - 35'	8/17/2018	67.3	<0.024	0.20	0.14	1.8	2.14	46	26	74	**146**
MW02 @ 18' - 20'	8/20/2018	1,809	0.046	0.64	0.26	2.9	3.85	38	37	<49	75
MW02 @ 23' - 25'	8/20/2018	11.0	0.030	0.14	<0.047	<0.094	0.17	<4.7	<10	<50	<64.7
MW03 @ 30' - 32'	10/5/2018	24.79	0.24	1.7	0.42	4.4	6.76	120	9.9	<49	**129.9**
MW03 @ 43' - 45'	10/5/2018	11.8	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.6	<48	62.4
MW04 @ 25' - 27'	10/5/2018	2,014	0.11	0.82	0.31	3.2	4.44	150	330	120	**600**
MW04 @ 39' - 40'	10/5/2018	51.4	<0.025	<0.049	<0.049	<0.098	<0.221	<4.9	<9.8	<49	<63.7
MW05 @ 21' - 23'	10/8/2018	496.7	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.3	<47	<61.1
MW05 @ 33' - 35'	10/8/2018	19.2	<0.023	<0.046	<0.046	<0.092	<0.207	<4.6	<9.8	<49	<63.4
MW06 @ 21' - 23'	8/22/2018	233	1.1	25	5.3	55	**86.4**	950	140	<49	**1,090**
MW07 @ 18' - 20'	10/9/2018	18.6	<0.025	<0.050	<0.050	<0.099	<0.224	<5.0	<9.5	<47	<61.5
MW07 @ 31' - 32'	10/9/2018	4.2	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.5	<48	<62.3
MW08 @ 30' - 32'	10/10/2018	11.5	0.037	0.076	<0.047	<0.095	0.113	<4.7	<9.9	<50	<64.6
MW08 @ 34' - 35'	10/10/2018	10.6	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<9.6	<48	<62.3
MW09 @ 15' - 17'	10/6/2018	1,821	0.25	3.0	1.5	17	21.75	430	36	<46	**466**
MW09 @ 42' - 43'	10/6/2018	5.6	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<10	<50	<64.7
MW10 @ 33' - 35'	10/4/2018	2,615	0.53	8.2	2.1	19	29.83	360	93	<48	**453**
MW10 @ 38' - 40'	10/4/2018	6.5	<0.023	<0.047	<0.047	<0.093	<0.21	<4.7	<9.6	<48	<62.3
MW11 @ 15' - 17'	10/6/2018	32.8	<0.024	0.060	0.094	1.2	1.354	28	<9.5	<47	28
MW11 @ 39' - 40'	10/6/2018	8	<0.024	<0.049	<0.049	<0.098	<0.22	<4.9	<9.8	<49	<63.7
MW12 @ 17' - 19'	10/8/2018	28.9	1.7	19	6.0	57	**83.7**	1,300	130	<46	**1,430**
MW12 @ 29' - 30'	10/8/2018	10	<0.024	<0.049	<0.049	<0.097	<0.219	<4.9	<9.8	<49	<63.7
MW13 @ 6' - 8'	10/10/2018	10	<0.024	<0.047	<0.047	<0.094	<0.212	<4.7	<9.8	<49	<63.5
MW13 @ 34' - 35'	10/10/2018	3	<0.023	<0.047	<0.047	<0.093	<0.210	<4.7	<9.6	<48	<62.3

TABLE 1
SOIL ANALYTICAL RESULTS

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
MW14 @ 24' - 26'	10/10/2018	18.8	<0.024	<0.047	<0.047	<0.095	<0.210	<4.7	<9.5	<47	<61.2
MW14 @ 32' - 34'	10/10/2018	2.3	<0.023	<0.046	<0.046	<0.092	<0.204	<4.6	<9.9	<49	<63.5
NMOCD Table 1 Limit			**10**	NE	NE	NE	**50**	NE	NE	NE	**100**

NOTES:

BTEX - benzene, toluene, ethylbenzene, and total xylenes analyzed by US EPA Method 8021B
DRO - diesel range organics analyzed by US EPA Method 8015D
GRO - gasoline range organics analyzed by US EPA Method 8015D
mg/kg - milligrams per kilogram
MRO - motor oil range organics analyzed by US EPA method 8015D
NA - not applicable
NE - not established
NMOCD - New Mexico Oil Conservation Division
PID - photo-ionization detector
ppm - parts per million
Table 1 - Closure Criteria for Soils Impacted by a Release per 19.15.19 August 2018
TPH - total petroleum hydrocarbons (sum of GRO, DRO, and MRO)
< - indicates result is less than the stated laboratory reporting limit
Bold - indicates value exceeds stated NMOCD standard

TABLE 2
GROUNDWATER ANALYTICAL RESULTS

STANDARD #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Sample Identification	Sample Date	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Total Xylenes (µg/l)	Conductivity (µmhos/cm)	Sulfate (mg/L)	Chloride (mg/L)	Total Dissolved Solids (mg/L)
GW01	5/15/2018	**3,400**	**6,800**	360	**3,600**	--	--	--	--
GW01	5/16/2018	--	--	--	--	--	--	--	**2,060**
GW01	6/12/2018	**1,600**	**4,100**	260	**3,400**	3,400	57	**500**	--
PW01	6/12/2018	5	4	<1.0	10	7,000	160	**2,000**	**3,810**
MW-02	10/22/2018	**14,000**	**7,100**	**1,200**	**12,000**	--	--	--	--
MW-10	10/22/2018	**22,000**	**21,000**	**1,600**	**13,000**	--	--	--	--
MW-11	10/22/2018	<1.0	<1.0	<1.0	<1.5	--	--	--	--
MW-12	10/22/2018	**2,400**	**3,800**	**1,100**	**5,000**	--	--	--	--
MW-14	10/22/2018	**13,000**	**26,000**	**1,100**	**10,000**	--	--	--	--
NMWQCC Standard		**10**	**750**	**750**	**620**	**NE**	**600**	**250**	**1,000**

NOTES:

µg/l - micrograms per liter

µmhos/cm - micromhos per centimeter

mg/L - milligrams per liter

NMWQCC - New Mexico Water Quality Control Commission

NE - not established

< - indicates result is less than the stated laboratory reporting limit

Bold - indicates value exceeds stated NMWQCC standard

APPENDIX A: SOIL BORING LOGS

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW01		Project: Standard #1	
Date: 8/16/2018		Project Number: 017817006	
Logged By: Eric Carroll		Drilled By: Enviro Drill	
Elevation: 5,795	Detector: PID	Drilling Method: Hollow Stem/ODEX	Sampling Method: Split Spoon
Gravel Pack: 10-20 Silica Sand (17'-29')		Seal: Bentonite (14'-17')	Grout: Bentonite/Cement slurry (0'-14')
Casing Type: Schedule 40 PVC		Diameter: 2" Length: 19'	Hole Diameter: 4.5" / Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"	Diameter: 2" Length: 10'	Total Depth: 36.1' / Depth to Water: 21'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
		0.0	N		0			SP	Poorly graded sand w/gravel, reddish brown, compact	Flush mount
	Dry				1				no stain/odor	
					2		40 %			
		0.0	N			1		SP	SAA	
	Dry				3					
					4					
		0.0	N					CL	Sandy clay with gravel< 15% , reddish brown, compact	
					5					
	Moist								No stain/odor	
					6					
		4.3	N		7			CL	SAA	
						2				
	Moist				8					
					9					
		7.0	N							
					10		40 %			
								CL	Sandy clay and gravel, reddish brown, compact, cobbles up to 1" diameter	
					11				No stain/odor	
	Moist				12				Switch to ODEX @13'	
						3				
					13					
					14				Poorly graded sand with gravel, cobbles and coarse sand, dark brown/black, loose	
								GP-GC		
	Dry	0.4	N		15				No stain/odor	

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW01
Project:	Standard #1
Project #	017817006
Date	8/16/2018 - 8/17/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					
	Dry	17.6	N		17	4		GP-GC	Coarse sand and gravel, trace clay/silt, light yellow brown No stain/odor	
					18					
					19					
	Dry	25.9	N		20			GP-GC	Coarse sand and gravel, trace clay/silt, light yellow brown No stain/odor	
					21					
	Dry	96.7	N		22	5		CH	Silty clay some sand/gravel, light brown compact, medium plasticity No stain/odor	
					23					
					24					
	Dry	111	N	MW01 @ 23 - 25'	25			Bed-rock	Cobbles and gravel (bedrock), dark brown No stain/odor	
					26					
					27	6				
					28					
					29					
	Dry	10.5	N		30			Bed-rock	SAA, No stain/odor	TD = 29' due to slough in borehole
					31					
					32					
					33	7				
	Dry	67.3	N	MW01 @ 30-	34				SAA	
					35					
					36					
					37				TD at 36.1', backfilled to 29' to set well	

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW02	Project: Standard #1
Date: 8/17/2018 - 8/20/2018	Project Number: 017817006
Logged By: Eric Carroll	Drilled By: Enviro Drill
Elevation: 5,795	Detector: PID
Drilling Method: ODEX	Sampling Method: Split Spoon
Gravel Pack: 10-20 Silica Sand (13'-25')	Seal: Bentonite (10'-13')
Grout: Bentonite/Cement Slurry (0'-10')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 15'
Hole Diameter: 4.5"	Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"
Diameter: 2" Length: 10'	Total Depth: 25'
Depth to Water: ~20'	

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0.0	N		0					
					1					
					2					
	Moist	0.0	N		3	1	80 %	SM	Silty sand, some clay <15%, trace gravel < 5%, reddish brown, compact No stain/odor	
					4					
	Moist	1.4	N		5			SM	SAA	
					6					
					7					
	Dry	0.0	N		8	2	30 %	SP	Coarse sand and gravel, trace fines < 5%, cobbles > 1" diameter, dark brown, very dense No stain/odor	
					9					
50										
	Dry	0.0	N		10			SP	SAA, No stain/odor	
					11					
	Moist	0.0	N		12			SP	Coarse sand some gravel < 15% , dark brown, loose No stain/odor	
					13	3	90 %			
					14					
30										
	Moist	0.0	N		15			SP	SAA	

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW02
Project:	Standard #1
Project #	017817006
Date	8/20/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
		n/a	No		15			GP	No recovery 15-17', large boulder	
					16					
	Dry				17					
					18	4				
					19			GP	Coarse sandy gravel w/cobbles and boulders,	
50		1,809	Yes	MW02 @ 18-20'	20		30 %		trace fines < 5%, dark brown, loose, slight staining and odor. Becoming saturated at 20'	
	Moist				21			GP	SAA Slight stain/odor	
		1,754	Yes		22					
	Sat				23	5				
					24					
100	Moist	110	No	MW02 @ 23-25'	25			CL	Sandy loam clay, yellow brown, compact No stain/odor	
					26				TD at 25'	
					27					
					28					
					29					
					30					
					31					
					32					
					33					
					34					
					35					
					36					
					37					

LT Environmental, Inc.
Advancing Opportunity

G WELL COMPLETION DIAGRAM

Boring/Well Number: MW03	Project: Standard #1
Date: 8/20/2018-8/23/2018, 10/5/2018	Project Number: 017817006
Logged By: Eric Carroll, Josh Adams	Drilled By: Cascade Drilling
Elevation: 5,795 / Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (20'-30')	Seal: Bentonite (17'-20')	Grout: Bentonite/Grout (0'-17')
Casing Type: Schedule 40 PVC	Diameter: 2" / Length: 20'	Hole Diameter: 10"	Depth to Liquid:
Screen Type: Schedule 40 PVC / Slot: 0.010"	Diameter: 2" / Length: 10'	Total Depth: 45' (set @ 30')	Depth to Water: dry

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
		0	N		0			SP	Poorly graded sand, some fines <15%, reddish brown, compact	Flush Mount
	Dry				1				No stain/odor	
					2		10	CL		
						1	0		Sandy clay, trace gravel, reddish brown,	
	Dry	0	N		3		%		No stain/odor	
					4					
20					5			CL	SAA No stain/odor	
					6					
					7					
					8	2				
					9				Refusal of hollow stem at 8', switch to ODEX	
					10		40		Sandy gravel, cobbles, dark brown, loose,	
	Moist	5.30	N				%		No stain/odor	
		28.7	N		11	10'-13'		SP-SM	Poorly graded sand with silt and gravel, light brown	
	Dry				12					
	Dry	42.0	N		13	10'-13'		SP-SM	Poorly graded sand with silt and gravel	
	Moist	34.9	N		14	13'-15'		SW	Well graded sand with gravel, brown	
	Moist	31.9	N		15			SP-SM	Poorly graded sand with silt, dark brown/grey	

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW03
Project:	Standard #1
Project #	017817006
Date	8/20/18-8/23/18, 10/5/18

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
	Moist	59.6	N		15	15'-20'		SP-SM	SAA
					16				
	Moist	45.9	N			15'-20'		SP-SM	SAA
					17				
					18				
	Moist	143.6	N			15'-20'		SP-SM	SAA
					19				
					20				
	Moist	2,294	Y, grey			20'-25'		SP-SM	SAA with grey stain
					21				
	Moist	539.8	Y, yellow			20'-25'		ML	Silt with sand, light brown
					22				
	Moist	1,602	Y, yellow			20'-25'		ML	SAA
					23				
					24				
	Dry	1,268	Y, grey			20'-25'		CH	Fat clay with sand, brown
					25				
	Moist	1,675	Y, yellow			25'-30'		CH	SAA
					26				
					27				
	Moist	2,460	Y, grey/			25'-30'		SP-SM	Poorly graded sand with silt, grey/black
					28				
	Moist	1,979	Y, black/ grey			25'-30'		CH	Fat clay with sand, brown and grey
					29				
					30				
	Moist	2,474	Y, grey/ black	MW03 @ 30'-32'		30'-35'		CH	SAA
					31				
					32				
	Moist	2,089	Y, grey yellow			30'-35'		CH	SAA
					33				
					34				
	Dry	1,436	Y, grey			30'-35'		CH	SAA
					35				
	Dry	154.1	N			35'-40'		CL	Lean clay with sand, brown
					36				
					37				

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW03
Project:	Standard #1
Project #	017817006
Date	8/20/18-8/23/18, 10/5/18

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
					37				
		66.6	N			35'-40'			
					38			CL	Lean clay with sand light brown
	Dry				39				
					40				
		70.1	N			40'-45'			Poorly graded sand with silt and gravel light brown/tan
	Dry				41				
					42				
	Dry	12.2	N			40'-45'			SAA
					43				
		11.8	N	MW03 @ 43'-45'		40'-45'			SAA
	Dry				44				
					45				
					46				TD at 45', backfilled to 30' to set well
					47				
					48				
					49				
					50				
					51				
					52				
					53				
					54				
					55				
					56				
					57				
					58				
					59				

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW04	Project: Standard #1
Date: 10/5/2018	Project Number: 017817006
Logged By: Josh Adams, Mary Mrdjenovich	Drilled By: Cascade Drilling
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (20'-30')	Seal: Bentonite (17'-20')
Grout: Bentonite/Grout (0'-17')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 20'
Hole Diameter: 10"	Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010" Diameter: 2" Length: 10'
Total Depth: 40'	Depth to Water: dry

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	2.4	N		0	0'-5'		SM	Silty sand, light brown	Stick up
	Moist	2.4	N		1	0'-5'		SM	SAA, brown	
	Moist	1.5	N		2	0'-5'		CL	Lean clay with sand, brown	
	Dry	1.2	N		3	0'-5'		CH	Sandy fat clay with leeche and gravel	
	Dry	1.0	N		4	5'-10'		CH	SAA	
	Dry	1.4	N		5	5'-10'		CH	SAA	
	Dry	0.9	N		6	5'-10'		CH	SAA	
	Damp	0.9	N		7	5'-10'		SP-SM	Poorly graded sand with silt and gravel, brown	
	Moist	3.3	N		8	10'-13'		SP-SM	SAA	
	Dry	5.4	N		9	10'-13'		SP-SM	SAA	
	Dry	5.4	N		10	13'-15'		SP-SM	SAA	
	Moist	7.7	N		11	13'-15'		SP-SM	SAA	
					12					
					13					
					14					
					15					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW04
Project:	Standard #1
Project #	017817006
Date	10/5/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	8.5	N		15	15'-23'		SP-SM	SAA	
					16					
	Damp	8.9	N		17	15'-23'		SP-SM	SAA	
					18				SAA	
					19					
	Moist	13.4	Y, black		20	15'-23'		CH	Sandy fat clay with gravel, brown with black staining, gas odor	
					21					
	Damp	1,045	N		22	15'-23'		CH	Fat clay with sand and gravel, tan	
					23					
	Dry	60	N		24	23'-30'		CH	SAA, brown, strong HC odor	
					25					
	Damp	2,014	N	MW04 @ 25'-27'	26	23'-30'		CH	SAA, strong HC odor	
					27					
	Damp	2,014	N		28	23'-30'		CH	SAA, strong HC odor	
	Damp	706.5	Y, dark grey		29	23'-30'		CH	SAA dark greyish-brown, strong HC odor	
					30					
	Damp	1,844	Y, grey		31	30'-35'		CH	Fat clay, brown, grey staining, HC odor	TD at 30'
					32					
					33					
	Damp	799	Y, dark grey		34	30'-35'		CH	SAA, strong HC odor	
					35					
	Dry	710	Y,		36	35'-40'		CL	Lean clay, light brown with sand, slight HC odor	
					37					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW04
Project:	Standard #1
Project #	017817006
Date	10/5/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					37					
	Dry	51.4	Y, slight yellow		38	35'-40'		CL	SAA	
					39					
	Dry	9.5	Y, slight yellow	MW04 @ 39'-40'	40			SS	Sandstone, light brown with thin grey layers	
					41				TD at 40', backfill to 30' to set well	
					42					
					43					
					44					
					45					
					46					
					47					
					48					
					49					
					50					
					51					
					52					
					53					
					54					
					55					
					56					
					57					
					58					
					59					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW05	Project: Standard #1
Date: 10/8/2018	Project Number: 017817006
Logged By: Josh Adams	Drilled By: Cascade Drilling
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (14'-27')	Seal: Bentonite (11'-14')
Grout: Bentonite/Grout (0'-11')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 17'
Hole Diameter: 10"	Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010" Diameter: 2" Length: 10'
Total Depth: 35'	Depth to Water: 28'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1.2	N		0	0'-5'		SP-SM		Stick up
	Dry	0.8	N		2	0'-5'		SP-SM	Silty sand with some pebbles, light brown	
	Dry	1.6	N		4	0'-5'		SP-SM		
	Dry	1.9	N		5	5'-10'		SP-SM	Poorly graded sand with silt and gravel	
	Moist	1.6	N		7	5'-10'		CH	Sandy fat clay with gravel	
	Moist	5.3	N		9	5'-10'		SP-SM	Poorly graded sand with silt and gravel	
	NR	NR			10	10'-13'			No Recovery	
	Dry	16.9	N		12	10'-13'		SP-SM	SAA	
	Moist	29.0	N		13	13'-15'		SW-SM	Well graded sand with silt and gravel, brown	

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW05
Project:	Standard #1
Project #	017817006
Date	10/8/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Moist	10.2	N		15	15'-25'		SW-SM	SAA	
					16					
					17	15'-25'		SW-SM	SAA	
	Moist	58.7	N		18					
					19					
	Moist	148.9	Y, black		20	15'-25'		SW-SM		
					21				Slight HC odor	
	Moist	496.7	N	MW05 @ 21-23'	22	15'-25'		SW-SM		
					23					
	Moist	143.4	N		24	15'-25'		CH	Sandy fat clay with gravel	
					25					
	Moist	19.7	N		26	25'-31'		CH	SAA	
					27					TD at 27'
	Moist	6.4	N		28	25'-31'		CH	SAA	
					29					
	Moist	9.0	N		30	25'-31'		CH	SAA	
					31					
	Moist	11.4	N		32	31'-35'		CH	SAA	
					33					
	Moist	19.2	N	MW05 @ 33'-35'	34	31'-35'		CH	SAA	
					35					
					36				TD 35', backfilled to 27' to set well	
					37					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW06	Project: Standard #1
Date: 8/21/2018 - 8/23/2018	Project Number: 017817006
Logged By: Eric Carroll	Drilled By: Enviro Drill
Elevation: 5,795	Detector: PID
Drilling Method: Hollow Stem/ODEX	Sampling Method: Split Spoon
Gravel Pack: 10-20 Silica Sand (12'-24')	Seal: Bentonite (9'-12')
Grout: Bentonite/Cement Slurry (0'-9')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 14'
Hole Diameter: 10"	Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"
Diameter: 2" Length: 10'	Total Depth: 25'
Depth to Water: 24'	

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0.0	N		0	1	90 %	SP-SM	Poorly graded sand, little silt/clay < 30%, reddish brown, compact No stain/odor	
40	Moist	0.0	N		5			SP-SM	Poorly graded sand, trace silt/clay < 15%, gravel, reddish brown, compact No stain/odor	
					7				Auger refusal at 7'	
	Dry	9.8	N		8	2	40 %	GP	Sandy gravel, grey and dark brown, loose No stain/odor	
	Dry	12.4	N		10			GP	SAA, No stain/odor	
	Moist	37.2	N		11	3	40 %	GP	SAA, No stain/odor	
	Moist	53.3	N		15			GP	SAA, No stain/odor	

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW06
Project:	Standard #1
Project #	017817006
Date	8/21/2018 - 8/23/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					
	Moist	867	N		17	4	50 %	GP	SAA No stain/strong odor	
					18					
					19			GP	Sandy gravel, loose, yellow brown staining and strong odor	
	Moist	1439	Y		20					
					21			CL	Sandy clay, rust colored mottling, yellow brown, compact	
	Dry	2330	Y	MW06 @ 21'-23'	22	5	80 %		Slight stain & odor	
					23					
					24		No recovery			TD at 24'
			Y		25			Bed-	Bedrock, dark grey, compact	
					26				TD at 25', well set at 24'	
					27					
					28					
					29					
					30					
					31					
					32					
					33					
					34					
					35					
					36					
					37					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW07	Project: Standard #1
Date: 10/9/2018	Project Number: 017817006
Logged By: Josh Adams	Drilled By: Cascade Drilling
Elevation: 5795 / Detector: PID	Drilling Method: Sonic / Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (9'-22')	Seal: Bentonite (7'-9') / Grout: Cement Slurry (0'-7')
Casing Type: Schedule 40 PVC — Diameter: 2" — Length: 13'	Hole Diameter: 10" / Depth to Liquid: 18'
Screen Type: Schedule 40 PVC — Slot: 0.010" — Diameter: 2" — Length: 10'	Total Depth: 35' / Depth to Water: dry

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
					0				
					1				
					2			SM	0-5' Removed with hand auger to clear hole. Silty Sand, light brown
					3				
					4				
					5				
	Dry	1.3	N		6	5'-10'		SM	Silty sand, light brown/tan No stain/odor
					7				
	Dry	2.4	N		8	5'-10'		SP-SM	Poorly graded sand with silt, gravel and cobbles
					9				
	Dry	4.5	N		10	5'-10'		SP-SM	SAA
	Dry	2.6	N		11	10'-11'		SP-SM	SAA
	Dry	10.4	N		12	11'-12.5'		SP-SM	SAA
	Dry	11.7	N		13	12.5'-15'		SP-SM	SAA
					14				
					15			SP-SM	SAA

Well Completion: Stick up

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW07
Project:	Standard #1
Project #	017817006
Date	10/9/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	4.8	N		15	15'-24.5'		SP-SM	SAA	
					16					
					17					
	Dry	4.3	N		18	15'-24.5'		SP-SM		
	Moist	18.6	N	MW07 @ 18'-20'	19	15'-24.5'		CH	Sandy fat clay, brown	
					20					
	Moist	14.1	N		21	15'-24.5'		CH	SAA	
					22					
	Damp	6.7	N		23	15'-24.5'		CH	SAA	TD to 22'
					24					
	Moist	6.4	N		25	24.5'-32'		CH	SAA, light gray and brown	
					26					
					27					
	Moist	5.7	N		28	24.5'-32'		CH	SAA dark gray	
					29					
	Moist	7.2	N		30	24.5'-32'		CH	SAA	
					31					
	Moist	4.2	N	MW07 @ 31'-32'	32	24.5'-32'		CH	SAA	
					33				TD at 32', backfill to 22' to set well	
					34					
					35					
					36					
					37					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW08	Project: Standard #1
Date: 10/10/2018	Project Number: 017817006
Logged By: Josh Adams	Drilled By: Cascade Drilling
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (12'-25')	Seal: Bentonite (9'-12')
Grout: Bentonite Gel (0'-9')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 15'
Hole Diameter: 10"	Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010" Diameter: 2" Length: 10'
Total Depth: 35'	Depth to Water: dry

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0					Stick up
	Dry	0.6	N		2			SM	Removed by hand, Silty sand, brown	
	Dry	1.5	N		5	5'-10'		SM	Silty sand, tan/cream	
	Dry	2.5	N		7	5'-10'		SP-SM	Poorly graded sand with silt, gravel and cobbles	
	Dry	2.5	N		9	5'-10'		SP-SM	SAA	
	Dry	2.0	N		10	10'-15'		SP-SM	SAA	
	Dry	4.2	N		12	10'-15'		SP-SM	SAA	
	Dry	4.0	N		14	10'-15'		SP-SM	SAA	

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW08
Project:	Standard #1
Project #	017817006
Date	10/10/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	5.1	N		15	15'-20'		SP-SM	SAA	
					16					
					17					
	Moist	2.8	N			15'-20'		SP-SM	SAA	
					18					
					19					
	Moist	3.4	N			15'-20'		SP-SM	SAA	
					20					
	Moist	1.4	N			20'-25'		CH	Sandy fat clay with gravel and cobbles, brown	
					21					
					22					
	Moist	3.8	N			20'-25'		CH	SAA	
					23					
					24					
	Moist	2.7	N			20'-25'		CH	SAA, dark brown no gravel or cobbles	TD at 25'
					25					
	Moist	0.8	N			25'-30'		CH	SAA	
					26					
					27					
	Moist	1.8	N			25'-30'		CH	SAA, very brown Fe stain	
					28					
					29					
	Moist	5.2	N			25'-30'		CH	SAA dark brown/grey	
					30					
	Moist	11.5	N	MW08 @ 30'-32'		30'-35'		CH	SAA	
					31					
					32					
	Moist	9.6	N			30'-35'		CH	SAA	
					33					
					34					
	Moist	10.6	N	MW08 @ 30'-32'		30'-35'		CH	SAA	
					35					
					36				TD at 35', backfilled to 25' to set well	
					37					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW09	Project: Standard #1
Date: 10/6/2018	Project Number: 017817006
Logged By: Mary Mrdjenovich	Drilled By: Cascade Drilling
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (12'-25')	Seal: Bentonite (10'-12')
Grout: Bentonite Gel (0'-10')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 15'
Hole Diameter: 10"	Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"
Diameter: 2" Length: 10'	Total Depth: 35'
Depth to Water: dry	

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	5.4	N		0	0'-5'		SM	Silty Sand, brown	Stick up
	Dry	8.8	N		1	0'-5'		SM	SAA, with gravel	
					2		100%			
	Dry	12.50	N		3	0'-5'		CL	Sandy lean clay with gravel, light brown, leeche	
					4					
	Dry	5.0	N		5	5'-6'	100%	CL	SAA	
	Dry	5.3	N		6	6'-10'		GM	Silty sand gravel, light grayish-brown	
					7					
					8		60%			
	Dry	7.6	N		9	6'-10'		GM	SAA, grayish-brown	
	Dry	14.1	N		10	10'-13'		GM	SAA	
					11					
					12		100%			
	Moist	282.2	Y, gray yellow		13	13'-20'		CH	Fat clay, dark grayish-brown, Hc odor	
					14					
					15					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW09
Project:	Standard #1
Project #	017817006
Date	10/6/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Damp	1821	Y, slight orange	MW09 @ 15'-17'	15	13'-20'		CH	SAA, Hc odor	
					16					
					17		100%			
	Dry	511.1	Y, orange		18	13'-20'		CH	SAA, gray and orange, Hc odor	
					19					
					20				SAA, dark gray, Hc odor	
	Damp	893.3	N		21	20'-25'		CH		
					22				SAA, tan with gray banding, Hc odor	
	Damp	799.9	N		23	20'-25'	100%	CH		
	Dry	122.2	N		24	20'-25'		CH	Fat clay, tan, no odor	
					25					
	Dry	74.6	Y, orange		26	25'-28'		CH	SAA, with sand pockets and lenses, Hc odor	TD at 25'
	Dry	17.60	N		27	25'-28'	100%	Bedrock	Sandstone, light yellowish-brown with gray banding	
					28					
	Dry	62.0	N		29	28'-35'		Bedrock	SAA	
					30					
	Dry	23.9	Y, slight orange		31	28'-35'		Bedrock	SAA, gray	
					32		100%			
					33					
	Dry	32.9	N		34	28'-35'		Bedrock	SAA, brown	
					35					
	Dry	11.3	N		36	35'-43'		Bedrock	SAA, gray	
					37					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW10	Project: Standard #1
Date: 10/4/2018	Project Number: 017817006
Logged By: Josh Adams	Drilled By: Cascade Drilling

Elevation: 5,795	Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (15'-35')		Seal: Bentonite (9.5'-15')	Grout: Bentonite/Gel (0'-9.5')
Casing Type: Schedule 40 PVC		Diameter: 2" Length: 15'	Hole Diameter: 10" / Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"	Diameter: 2" Length: 20'	Total Depth: 35' / Depth to Water: 16'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry		N		0	0'-5'		SM-SP	Poorly graded sand with silt, light brown	Stick up
					1					
	Dry	2.5	N		2	0'-5'	100%	SM	Silty sand, light brown, plastic fines	
					3					
					4					
	Dry	1.8	N		5	5'-15'		SM	SAA	
					6					
	Moist	2.0	N		7	5'-15'		ML	Silt with sand, gravel and organics, light brown	
					8					
	Dry	6.1	N		9	5'-15'		ML	SAA, with gravel and cobbles	
					10		100%			
	Dry	7.5	N		11	5'-15'		SP-SM	Poorly graded sand with gravel	
					12					
	Dry	7.0	N		13	5'-15'		SP-SM	SAA	
					14					
					15					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW10
Project:	Standard #1
Project #	017817006
Date	10/4/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	16.7	N		15	15'-25'		SP-SM	SAA	
					16					
	Moist	4.5	N			15'-25'		SW-SM	Well graded sand with silt	
					17					
					18					
					19					
	Moist	14.8	N		20	15'-25'		SP-SM	Poorly graded sand with silt and gravel	
	Moist	1066	Y,		21	15'-25'		ML	Silt with sand, light brown	
					22					
					23					
	Moist	1098	Y,			15'-25'		ML	SAA	
					24					
					25					
					26				No Recovery	
	Moist	2188	Y,			25'-30'		ML	SAA	
					27					
					28					
	Moist	1552	Y,			25'-30'	100%	ML	SAA	
					29					
					30					
					31				No Recovery	
	Moist	1698	Y,		32	30'-35'		ML	SAA	
					33					
	Dry	2615	Y,	MW10		30'-35'		SM	Silty sand, light brown Strong Hc odor	
					34					
					35					TD at 35'
					36				No Recovery	
					37					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW10
Project:	Standard #1
Project #	017817006
Date	10/4/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	12	N		37			SW	Well graded sand, tan No stain/odor	
	Dry	6.5	N	MW10	38 39			SW	SAA	
					40				TD at 40', backfilled to 35' to set well	
					41					
					42					
					43					
					44					
					45					
					46					
					47					
					48					
					49					
					50					
					51					
					52					
					53					
					54					
					55					
					56					
					57					
					58					
					59					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW11	Project: Standard #1
Date: 10/8/2018	Project Number: 017817006
Logged By: Mary Mrdjenovich	Drilled By: Cascade Drilling

Elevation: 5,795	Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (12'-25')		Seal: Bentonite (10'-12')	Grout: Bentonite/Gel (0'-10')
Casing Type: Schedule 40 PVC		Diameter: 2" / Length: 15'	Hole Diameter: 10" / Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"	Diameter: 2" / Length: 10'	Total Depth: 40' / Depth to Water: 20

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1.4	N		0	0'-5'		SM	Silty sand with gravel, light brown, trace leeche	Stick up
					1					
					2					
	Dry	0.9	N		3	0'-5'	100%	SM	SAA	
					4					
					5					
	Dry	0.2	N		6	5'-8'		GM	Silty sand gravel, light brwn	
					7		100%			
	Damp	0.1	N		8	5'-8'		GM	SAA, brown	
	Damp	1.5	N		9	8'-15'		GM	SAA	
					10					
	Moist	2.3	N		11	8'-15'		GM	SAA	
					12		100%			
	Moist	4.7	N		13	8'-15'		GM	SAA	
					14					
	Moist	3.2	N		15	8'-15'		GM	SAA, dark brown, slight Hc odor	

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW11
Project:	Standard #1
Project #	017817006
Date	10/8/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	32.8	N	MW11 @15'-17'	15	15'-25'		GM	SAA	
					16					
					17					
	Moist	3.1	Y, yellowish-brown		18	15'-25'		CL-GW	Gravelly sandy lean clay, dark brown	
					19					
	Moist	6.2	N		20	15'-25'	100%	GW	Gravelly sand, dark brown	
					21					
	Damp	2.2	Y, yellow and		22	15'-25'		CL-GW	Sandy lean clay with gravel, tan	
					23					
	Moist	4.6	N		24	25'-29'		CH	Fat clay, grayish brown	
					25					
	Damp	32.6	Y, black		26	25'-29'		CH	Light grey	TD at 25'
					27					
	Dry	31.8	Y, black and yellow		28	25'-29'	100%	CH	SAA	
					29					
	Dry	11.3	N		30	29'-34'		CH	SAA with thin sand lenses	
					31					
	Dry	4.9	Y, slight orange		32	29'-34'	100%	Bedrock	Sandstone, yellowish brown with grey banding	
					33					
					34					
	Dry	29.3	N		35	34'-35'	100%	Bedrock	SAA, light brown	
	Dry	18.4	Y, slight orange		36	35'-40'	100%	Bedrock	SAA	
					37					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW11
Project:	Standard #1
Project #	017817006
Date	10/8/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	8.00	Y,	MW11	37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59	35'-40'		Bedrock	SAA TD at 40', set well at 25'	

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW12	Project: Standard #1
Date: 10/8/2018	Project Number: 017817006
Logged By: Josh Adams	Drilled By: Cascade Drilling

Elevation: 5,795	Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (9'-22')		Seal: Bentonite (7'-9')	Grout: Bentonite/Gel (0'-7')
Casing Type: Schedule 40 PVC		Diameter: 2" Length: 12'	Hole Diameter: 10" / Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"	Diameter: 2" Length: 10'	Total Depth: 30' / Depth to Water: 21

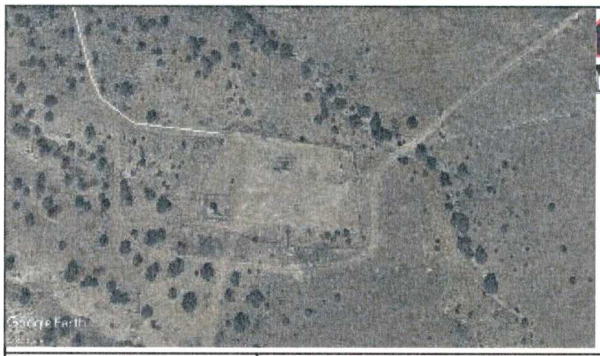
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
					0				
					1				No Recovery 0'-2'
					2				
	Dry	1.4	N		3	2'-5'	100%	SM	Silty sand, brown
	Dry	2.0	N		4	2'-5'		SM	SAA
	Dry	8.4	N		5	5'-11'		SP-SM	Poorly graded sand wth silt and gravel
					6				
	Dry	9.6	N		7	5'-11'		SP-SM	SAA
					8		100%		
	Dry	6.1	N		9	5'-11'		SP-SM	SAA
					10				
	Dry	19.2	N		11	11'-14'		SP-SM	SAA
					12				
	Moist	7.2	N		13	11'-14'	100%	SP-SM	SAA
	Moist	15.5	N		14	14'-15'	100%	SW-SM	Well graded sand with silt and gravel
					15				

Well Completion: Stick up

Advancing Opportunity

Boring/Well #	MW12
Project:	Standard #1
Project #	017817006
Date	10/8/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15				No Recovery 15'-16'	
					16					
	Moist	28.9	N	MW12 @ 17'-	17	15-25'		SP-SM	Poorly graded sand with silt and gravel	
	Moist	2800	Y,		18	15-25'		CH	Sandy fat clay with silt and gravel Hc odor	
					19					
	Moist	3042	Y,		20	15-25'	90%	CH	SAA	
					21					
					22					TD at 22'
	Moist	11.2	N		23	15-25'		CH	Sandy fat clay	
					24					
	Moist	8.6	N		25	15-25'		CH	SAA	
	Moist	17.3	N		26	25'-30'		CH	SAA	
					27					
	Moist	1.6	N		28	25'-30'	100%	CH	SAA	
					29					
	Moist	1	N	MW12 @ 39'-40'	30	25'-30'		CH	SAA	
					31				TD at 30', set well at 22'	
					32					
					33					
					34					
					35					
					36					
					37					



LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW13	Project: Standard #1
Date: 10/10/2018	Project Number: 017817006
Logged By: Josh Adams	Drilled By: Cascade Drilling
Elevation: 5,795	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (8'-21')	Seal: Bentonite (6'-8')
Grout: Bentonite/Gel (0'-6')	
Casing Type: Schedule 40 PVC	Diameter: 2" Length: 11'
Hole Diameter: 10"	Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"
Diameter: 2" Length: 10'	Total Depth: 35'
Depth to Water: 13'	

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1	N		0	0'-6'		SM	Silty sand, browish-red	Stick up
	Dry	2.3	N		3	0'-6'	100%	SM	SAA	
	Dry	1.9	N		5	0'-6'		SM	SAA, with some pebbles	
	Dry	9.6	N	MW13 @ 6'-8'	7	6'-9'		SM	SAA	
	Dry	7.7	N		8	6'-9'	100%	SP-SM	Poorly graded sand with silt, gravel and cobbles, brown	
	Dry	3.7	N		9	9'-16'		SP-SM	SAA	
	Dry	3.4	N		11	9'-16'		SP-SM	SAA	
	Moist	4.4	N		13	9'-16'	100%	SP-SM	SAA	
					15					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW13
Project:	Standard #1
Project #	017817006
Date	10/10/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Moist	3.2	N		15	9'-16'		CH	Sandy fat clay, brown	
	Moist	8.9	N		16	16'-21'		CH	SAA, grey/black	
					17					
	Moist	2.3	N		18	16'-21'	100%	CH	SAA	
					19					
	Moist	4.3	N		20	16'-21'		CH	SAA	
					21					
	Dry	5.5	N		22	21'-26'		CH	Sandy lean clay, brown/tan	TD at 21'
					23					
	Dry	6.1	N		24	21'-26'	100%	CH	SAA	
					25					
	Dry	6.4	N		26	21'-26'		CH	SAA	
	Dry	1.8	N		27	26'-30'		CH	SAA	
					28					
	Dry	4.5	N		29	26'-30'	100%	CH	SAA	
					30				Sandy fat clay, dark brown	
	Dry	2.9	N		31	30'-35'		CH	SAA, brown	
					32					
	Dry	0.8	N		33	30'-35'	100%	CH	SAA	
					34					
	Dry	3	N	MW13 @ 34'-35'	35	30'-35'		CH	SAA, light brown	
					36				TD at 35', backfilled to 21' to set well	
					37					

LT Environmental, Inc.
Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW14			Project: Standard #1
Date: 10/10/2018			Project Number: 017817006
Logged By: Josh Adams			Drilled By: Cascade Drilling
Elevation: 5,795	Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10-20 Silica Sand (11'-26')		Seal: Bentonite (11'-16')	Grout: Bentonite/Gel (0'-11')
Casing Type: Schedule 40 PVC		Diameter: 2" / Length: 16'	Hole Diameter: 10" / Depth to Liquid:
Screen Type: Schedule 40 PVC	Slot: 0.010"	Diameter: 2" / Length: 10'	Total Depth: 34' / Depth to Water: 11'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0					Stick up
					1				No Recovery 0'-2'	
	Dry	2.8	N		2	0'-4'	50%	SM	Silty sand with gravel, brown	
					3					
	Dry	5.3	N		4	4'-9'		SP-SM	Poorly graded sand with silt, gravel and cobbles, light brown/tan/cream	
					5					
	Dry	2.4	N		6	4'-9'		SP-SM	SAA	
					7		100%			
	Dry	2.3	N		8	4'-9'		SP-SM	SAA	
	Dry	4.3	N		9	9'-14'		SP-SM	SAA, brown	
					10					
	Moist	3.5	N		11	9'-14'		SP-SM	SAA	
					12		100%			
	Moist	4.3	N		13	9'-14'		SP-SM	SAA, dark brown	
					14					
					15					

LT Environmental, Inc.
Advancing Opportunity

Boring/Well #	MW14
Project:	Standard #1
Project #	017817006
Date	10/10/2018

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Moist	5.2	N		15	14'-24'		SP-SM	SAA	
					16					
	Moist	10.4	N			14'-24'		SP-SM	SAA, dark brown	
					17					
					18					
	Moist	4.5	N			14'-24'		CL	Sandy lean clay, orange/brown	
					19		100%			
					20					
	Moist	1.5	N			14'-24'		CL	SAA	
					21					
								CH	Sandy fat clay, dark brown	
					22					
	Moist	2.4	N			14'-24'		CH	SAA	
					23					
					24					
	Moist	28.8	N	MW14		24'-		CH	SAA	
					25					
					26					
	Dry	7	N			24'-	100%	CH	SAA	TD at 26'
					27	28.5'				
					28					
	Dry	4.3	N		29	28.5'-		CH	SAA	
						34'				
					30					
	Dry	2.3	N			28.5'-		CH	SAA, light brown	
					31	34'	100%			
					32					
	Dry	2.3	N	MW14 @ 32'-34'		28.5'-		CH	SAA	
					33	34'				
					34					
									TD at 34', backfilled to 26' to set well	
					35					
					36					
					37					

APPENDIX B: LABORATORY ANALYTICAL REPORTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

May 09, 2018

Ashley Ager
LTE
848 East 2nd Avenue
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Standard 1 OrderNo.: 1805383

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 1 sample(s) on 5/8/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

HALL ENVIRO
ANALYS
LABORA

May 09, 2018

Ashley Ager
LTE
848 East 2nd Aven
Durango, CO 8130
TEL: (970) 946-1
FAX

RE: Standard 1

Dear Ashley Ager:

Hall Environmenta
analyses presented

These were analyze
tests please go to w
properly interpret y
See the sample che
sample receipt temp
provided if the sam
When necessary, da
QC summary repor
received, unless oth
parameters that req
chlorine are qualifi

Please don't hesitat

ADHS Cert #AZ06

Sincerely,

Andy Freeman
Laboratory Manage
4901 Hawkins NE
Albuquerque, NM 8

Analytical Report
Lab Order **1805383**
Date Reported: **5/9/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Project: Standard 1
Lab ID: 1805383-001 **Matrix:** SOIL

Client Sample ID: BR-1
Collection Date: 5/7/2018 10:17:00 AM
Received Date: 5/8/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	5/8/2018 9:47:30 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/8/2018 9:47:30 AM
Surr: DNOP	94.6	70-130		%Rec	1	5/8/2018 9:47:30 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.1		mg/Kg	1	5/8/2018 9:33:26 AM
Surr: BFB	95.3	15-316		%Rec	1	5/8/2018 9:33:26 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	0.053	0.020		mg/Kg	1	5/8/2018 9:33:26 AM
Toluene	ND	0.041		mg/Kg	1	5/8/2018 9:33:26 AM
Ethylbenzene	ND	0.041		mg/Kg	1	5/8/2018 9:33:26 AM
Xylenes, Total	0.11	0.082		mg/Kg	1	5/8/2018 9:33:26 AM
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	5/8/2018 9:33:26 AM

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 Quanitative 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#: **1805383**

09-May-18

Client: LTE

Project: Standard 1

Sample ID **1805383-001AMS**	SampType: **MS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **BR-1**	Batch ID: **37982**			RunNo: **51108**					
Prep Date: **5/8/2018**	Analysis Date: **5/8/2018**			SeqNo: **1660535**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.5	47.62	6.477	92.7	55.8	125			
Surr: DNOP	4.8		4.762		101	70	130			

Sample ID **1805383-001AMSD**	SampType: **MSD**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **BR-1**	Batch ID: **37982**			RunNo: **51108**					
Prep Date: **5/8/2018**	Analysis Date: **5/8/2018**			SeqNo: **1660539**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.56	6.477	94.6	55.8	125	6.96	20	
Surr: DNOP	5.0		5.056		99.4	70	130	0	0	

Sample ID **LCS-37982**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **37982**			RunNo: **51108**					
Prep Date: **5/8/2018**	Analysis Date: **5/8/2018**			SeqNo: **1660547**		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	91.5	70	130			
Surr: DNOP	4.8		5.000		96.1	70	130			

Sample ID **MB-37982**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **37982**			RunNo: **51108**					
Prep Date: **5/8/2018**	Analysis Date: **5/8/2018**			SeqNo: **1660552**		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		96.0	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 Quanitative 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#: **1805383**

09-May-18

Client: LTE

Project: Standard 1

Sample ID **MB-37971**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **37971**	RunNo: **51106**
Prep Date: **5/7/2018**	Analysis Date: **5/8/2018**	SeqNo: **1660890** 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		95.5	15	316			

Sample ID **LCS-37971**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **37971**	RunNo: **51106**
Prep Date: **5/7/2018**	Analysis Date: **5/8/2018**	SeqNo: **1660891** 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	107	75.9	131			
Surr: BFB	1100		1000		107	15	316			

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 Quanitative 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#: **1805383**

09-May-18

Client: LTE

Project: Standard 1

Sample ID **MB-37971**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **37971**	RunNo: **51106**
Prep Date: **5/7/2018**	Analysis Date: **5/8/2018**	SeqNo: **1660910** 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		109	80	120			

Sample ID **LCS-37971**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **37971**	RunNo: **51106**
Prep Date: **5/7/2018**	Analysis Date: **5/8/2018**	SeqNo: **1660911** 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	96.2	77.3	128			
Toluene	0.99	0.050	1.000	0	99.0	79.2	125			
Ethylbenzene	0.98	0.050	1.000	0	98.3	80.7	127			
Xylenes, Total	3.0	0.10	3.000	0	99.9	81.6	129			
Surr: 4-Bromofluorobenzene	1.1		1.000		114	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 Quanitative 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

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: LTE | Work Order Number: 1805383 | RcptNo: 1

Received By: Anne Thorne 5/8/2018 7:00:00 AM Anne Thorne

Completed By: Anne Thorne 5/8/2018 7:08:42 AM Anne Thorne

Reviewed By: JMO 5/8/18

Labeled by: AT 05/08/18

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? (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 °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.7	Good	Yes			

Chain-of-Custody Record

Client: LTE

Mailing Address: 848 E 2nd Ave
Durango, CO 81301

Phone #: 970 385 1096

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☒ Rush Same Day

Project Name:
Standard #1

Project #:

Project Manager:
Ashley Ager

Sampler: Ashley Ager

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.7

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and # (05/03/18)	Preservative Type	HEAL No.	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)
5-7-18	1017	soil	BR-1	4oz/1 MeOH4+	0001	1805383-001	✓		✓													

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date	Time
5-7-18	1110	Ashley Ager		5/7/18	1110
5/7/18	1814	Christin Warten		05/08/18	0700

Remarks:

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

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

May 17, 2018

Ashley Ager
LTE
848 East 2nd Avenue
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Standard 1 OrderNo.: 1805855

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 1 sample(s) on 5/16/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1805855**
Date Reported: **5/17/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Project: Standard 1
Lab ID: 1805855-001

Client Sample ID: GW01
Collection Date: 5/15/2018 2:15:00 PM
Matrix: AQUEOUS **Received Date:** 5/16/2018 6:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	3400	50		µg/L	50	5/16/2018 10:52:29 AM	A51321
Toluene	6800	500		µg/L	500	5/16/2018 11:40:51 AM	A51321
Ethylbenzene	360	50		µg/L	50	5/16/2018 10:52:29 AM	A51321
Xylenes, Total	3600	75		µg/L	50	5/16/2018 10:52:29 AM	A51321
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	50	5/16/2018 10:52:29 AM	A51321
Surr: Toluene-d8	103	70-130		%Rec	50	5/16/2018 10:52:29 AM	A51321

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 Quanitative 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#: **1805855**

17-May-18

Client: LTE

Project: Standard 1

Sample ID **100ng lcs**	SampType: **LCS4**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **BatchQC**	Batch ID: **A51321**	RunNo: **51321**
Prep Date:	Analysis Date: **5/16/2018**	SeqNo: **1669406** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	89.6	80	120			
Toluene	19	1.0	20.00	0	97.0	80	120			
Ethylbenzene	20	1.0	20.00	0	97.9	80	120			
Xylenes, Total	57	1.5	60.00	0	94.7	80	120			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.1	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID **1805855-001ams**	SampType: **MS4**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GW01**	Batch ID: **A51321**	RunNo: **51321**
Prep Date:	Analysis Date: **5/16/2018**	SeqNo: **1669409** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	4200	50	1000	3391	81.3	80	120			
Toluene	8600	50	1000	7814	78.4	80	120			ES
Ethylbenzene	1500	50	1000	355.7	110	80	120			
Xylenes, Total	7200	75	3000	3564	121	80	120			S
Surr: 4-Bromofluorobenzene	550		500.0		110	70	130			
Surr: Toluene-d8	520		500.0		104	70	130			

Sample ID **1805855-001amsd**	SampType: **MSD4**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GW01**	Batch ID: **A51321**	RunNo: **51321**
Prep Date:	Analysis Date: **5/16/2018**	SeqNo: **1669410** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	4200	50	1000	3391	77.5	80	120	0.907	20	S
Toluene	8600	50	1000	7814	83.6	80	120	0.598	20	E
Ethylbenzene	1400	50	1000	355.7	108	80	120	1.52	20	
Xylenes, Total	7200	75	3000	3564	120	80	120	0.626	20	
Surr: 4-Bromofluorobenzene	530		500.0		106	70	130	0	0	
Surr: Toluene-d8	530		500.0		106	70	130	0	0	

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A51321**	RunNo: **51321**
Prep Date:	Analysis Date: **5/16/2018**	SeqNo: **1669411** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								

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 Quanitative 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#: **1805855**

17-May-18

Client: LTE

Project: Standard 1

Sample ID **rb**	SampType: **MBLK**		TestCode: **EPA Method 8260: Volatiles Short List**		
Client ID: **PBW**	Batch ID: **A51321**		RunNo: **51321**		
Prep Date:	Analysis Date: **5/16/2018**		SeqNo: **1669411**	Units: **µg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	12		10.00		115	70	130			
Surr: Toluene-d8	10		10.00		101	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 Quanitative 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

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: LTE | Work Order Number: 1805855 | RcptNo: 1

Received By: Anne Thorne 5/16/2018 6:45:00 AM

Completed By: Anne Thorne 5/16/2018 7:54:56 AM

Reviewed By: JMD 5/16/18

Labeled by AT 05/16/18

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? (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 °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.4	Good	Yes			

Chain-of-Custody Record

Client: Ashley Ager (LT Environmental)
848 E 2nd Ave
Mailing Address:
Durango, CO 81301
Phone #: (970) 385-1096
email or Fax#: AAger@LTEnv.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☑ Rush 24-Hour
Project Name:
Standard #1
Project #:
017817006
Project Manager:
Ashley Ager
Sampler: Michael A. Wicker
On Ice: ☒ Yes ☐ No
Sample Temperature: 2.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1805855	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)
5-15-18	1415	AQ	GW01	2-VOA	HCl	001	X									"					

5-15-18

Date:	Time:	Relinquished by:	Received by:	Date Time	Remarks:
5-15-18	1520			5/15/18 1520	
5/15/18	1816			05/16/18 0645	

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

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

May 21, 2018

Ashley Ager
LTE
848 East 2nd Avenue
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Standard 1 OrderNo.: 1805955

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 1 sample(s) on 5/17/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1805955**
Date Reported: **5/21/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: GW01
Project: Standard 1
Collection Date: 5/16/2018 12:30:00 PM
Lab ID: 1805955-001
Matrix: AQUEOUS
Received Date: 5/17/2018 6:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **sat**	
Total Dissolved Solids	2060	100	*D	mg/L	1	5/18/2018 1:01:00 PM	38176

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 Quanitative 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#: **1805955**

21-May-18

Client: LTE
Project: Standard 1

Sample ID **MB-38176**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **38176**	RunNo: **51376**
Prep Date: **5/17/2018**	Analysis Date: **5/18/2018**	SeqNo: **1671669** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-38176**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **38176**	RunNo: **51376**
Prep Date: **5/17/2018**	Analysis Date: **5/18/2018**	SeqNo: **1671670** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	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 Quanitative 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

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: LTE | Work Order Number: 1805955 | RcptNo: 1

Received By: Anne Thorne 5/17/2018 6:50:00 AM

Completed By: Anne Thorne 5/17/2018 8:20:38 AM

Reviewed By: JO 5/17/18

Labeled by AT 05/17/18

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? (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 °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: Ashley Ager
LT Environmental, Inc
Mailing Address: 848 E 2nd Ave
Durango, CO
Phone #: (970) 385-1096
email or Fax#: AAger@LTEnv.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☑ Rush 24-Hour
Project Name: Standard #1
Project #: 01781700b
Project Manager: Ashley Ager
Sampler: Michael A Wicker
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1805955	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)		TDS			Air Bubbles (Y or N)
5-16-18	1230	AQ	GW01	1-500mL	Cool	001													X			

5-16-18

Date:	Time:	Relinquished by:	Received by:	Date	Time
5-16-18	1528			5/16/18	1528
5/16/18	1840			05/17/18	0650

Remarks:

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

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

June 25, 2018

Devin Hencmann
LTE
848 East 2nd Avenue
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Standard #1 OrderNo.: 1806759

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/13/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1806759**
Date Reported: **6/25/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Project: Standard #1
Lab ID: 1806759-001 **Matrix:** AQUEOUS

Client Sample ID: GW01
Collection Date: 6/12/2018 9:20:00 AM
Received Date: 6/13/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	500	25	*	mg/L	50	6/25/2018 12:26:44 PM
Sulfate	57	2.5		mg/L	5	6/13/2018 7:02:34 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**
Benzene	1600	50		µg/L	50	6/19/2018 5:37:00 AM
Toluene	4100	50		µg/L	50	6/19/2018 5:37:00 AM
Ethylbenzene	260	50		µg/L	50	6/19/2018 5:37:00 AM
Xylenes, Total	3400	75		µg/L	50	6/19/2018 5:37:00 AM
Surr: 1,2-Dichloroethane-d4	98.1	70-130		%Rec	50	6/19/2018 5:37:00 AM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	50	6/19/2018 5:37:00 AM
Surr: Dibromofluoromethane	93.3	70-130		%Rec	50	6/19/2018 5:37:00 AM
Surr: Toluene-d8	94.4	70-130		%Rec	50	6/19/2018 5:37:00 AM
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**
Conductivity	3400	5.0		µmhos/c	1	6/18/2018 5:18:54 PM

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 Quanitative 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#: **1806759**

25-Jun-18

Client: LTE

Project: Standard #1

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R51964**	RunNo: **51964**
Prep Date:	Analysis Date: **6/13/2018**	SeqNo: **1698742** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R51964**	RunNo: **51964**
Prep Date:	Analysis Date: **6/13/2018**	SeqNo: **1698743** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.2	0.50	10.00	0	92.3	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R52211**	RunNo: **52211**
Prep Date:	Analysis Date: **6/25/2018**	SeqNo: **1710769** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R52211**	RunNo: **52211**
Prep Date:	Analysis Date: **6/25/2018**	SeqNo: **1710770** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	96.1	90	110			

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 Quanitative 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#: **1806759**

25-Jun-18

Client: LTE

Project: Standard #1

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL52058**	RunNo: **52058**
Prep Date:	Analysis Date: **6/19/2018**	SeqNo: **1704161** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	70	130			
Toluene	20	1.0	20.00	0	99.3	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		99.9	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		105	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.0	70	130			
Surr: Toluene-d8	9.7		10.00		96.8	70	130			

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL52058**	RunNo: **52058**
Prep Date:	Analysis Date: **6/19/2018**	SeqNo: **1704162** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.5	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	9.3		10.00		92.8	70	130			
Surr: Toluene-d8	9.5		10.00		95.0	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 Quanitative 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#: **1806759**

25-Jun-18

Client: LTE

Project: Standard #1

Sample ID	**lcs-1 ~20uS eC**	SampType:	**LCS**	TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R52062**	RunNo:	**52062**				
Prep Date:		Analysis Date:	**6/18/2018**	SeqNo:	**1703214**	Units:	**µmhos/cm**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	22	5.0	19.98	0	113	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 Quanitative 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

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: LTE | Work Order Number: 1806759 | RcptNo: 1

Received By: Isaiah Ortiz 6/13/2018 7:00:00 AM IG

Completed By: Isaiah Ortiz 6/13/2018 9:58:09 AM IG

Reviewed By: ENM Lb: JB 06/13/18 6/13/18

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° 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: JB 06/13/18

Special Handling (if applicable)

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

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ 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	1.3	Good	Yes			

Chain-of-Custody Record

Client: Devin Hencmann
LT Environment, Inc.
Mailing Address: 848 E 2nd Ave
Durango, CO 81301
Phone #: (970) 385-1096
email or Fax#: DHencmann@LTEnv.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☑ Standard ☐ Rush _____
Project Name: Standard #1
Project #: 017817006
Project Manager: Devin Hencmann
Sampler: Michael Wicker
On Ice: ☑ Yes ☐ No
Sample Temperature: 2.3-CF-1.0=1.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1806759	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 (~~8021~~) BTEX	8270 (Semi-VOA)		Chloride, Sulfate, EC			Air Bubbles (Y or N)
6-12-18	0920	AQ	GW01	3-VOA, 1-Poly	HCl, Cool	-001										X			X			

8-12-18

Date:	Time:	Relinquished by:	Received by:	Date	Time
6-12-18	1134		Chet Walters	6/12/18	1134
6/12/18	1854	Chet Walters		06/13/18	0700

Remarks: cc: JDeal@Hilcorp.com

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

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

August 22, 2018

Devin Hencmann
Hilcorp Energy
PO Box 61529
Houston, TX 77208-1529
TEL: (337) 276-7676
FAX

RE: Standard 1 OrderNo.: 1808B66

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 2 sample(s) on 8/18/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1808B66**
Date Reported: **8/22/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1808B66-001 **Matrix:** SOIL

Client Sample ID: MW01 23-25'
Collection Date: 8/16/2018 4:00:00 PM
Received Date: 8/18/2018 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**	
Diesel Range Organics (DRO)	16	9.7		mg/Kg	1	8/21/2018 8:30:58 PM	39889
Motor Oil Range Organics (MRO)	70	48		mg/Kg	1	8/21/2018 8:30:58 PM	39889
Surr: DNOP	118	50.6-138		%Rec	1	8/21/2018 8:30:58 PM	39889
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	9.9	4.7		mg/Kg	1	8/21/2018 11:41:05 PM	39888
Surr: BFB	119	15-316		%Rec	1	8/21/2018 11:41:05 PM	39888
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	8/21/2018 11:41:05 PM	39888
Toluene	ND	0.047		mg/Kg	1	8/21/2018 11:41:05 PM	39888
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2018 11:41:05 PM	39888
Xylenes, Total	ND	0.093		mg/Kg	1	8/21/2018 11:41:05 PM	39888
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	8/21/2018 11:41:05 PM	39888

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1808B66-002 **Matrix:** SOIL

Client Sample ID: MW01 20-35'
Collection Date: 8/17/2018 9:30:00 AM
Received Date: 8/18/2018 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**	
Diesel Range Organics (DRO)	26	9.7		mg/Kg	1	8/21/2018 8:53:00 PM	39889
Motor Oil Range Organics (MRO)	74	49		mg/Kg	1	8/21/2018 8:53:00 PM	39889
Surr: DNOP	116	50.6-138		%Rec	1	8/21/2018 8:53:00 PM	39889
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	46	4.7		mg/Kg	1	8/22/2018 12:27:47 AM	39888
Surr: BFB	211	15-316		%Rec	1	8/22/2018 12:27:47 AM	39888
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/22/2018 12:27:47 AM	39888
Toluene	0.20	0.047		mg/Kg	1	8/22/2018 12:27:47 AM	39888
Ethylbenzene	0.14	0.047		mg/Kg	1	8/22/2018 12:27:47 AM	39888
Xylenes, Total	1.8	0.094		mg/Kg	1	8/22/2018 12:27:47 AM	39888
Surr: 4-Bromofluorobenzene	112	80-120		%Rec	1	8/22/2018 12:27:47 AM	39888

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 Quanitative 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#: **1808B66**

22-Aug-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID **MB-39889**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **39889**	RunNo: **53591**
Prep Date: **8/20/2018**	Analysis Date: **8/21/2018**	SeqNo: **1768073** 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-39889**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **39889**	RunNo: **53591**
Prep Date: **8/20/2018**	Analysis Date: **8/21/2018**	SeqNo: **1768074** 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	95.6	70	130			
Surr: DNOP	4.6		5.000		91.5	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 Quanitative 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#: **1808B66**

22-Aug-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID **MB-39888**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **39888**	RunNo: **53602**
Prep Date: **8/20/2018**	Analysis Date: **8/21/2018**	SeqNo: **1767508** 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		90.1	15	316			

Sample ID **LCS-39888**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **39888**	RunNo: **53602**
Prep Date: **8/20/2018**	Analysis Date: **8/21/2018**	SeqNo: **1767509** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	94.0	75.9	131			
Surr: BFB	1000		1000		100	15	316			

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 Quanitative 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#: **1808B66**

22-Aug-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID **MB-39888**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **39888**	RunNo: **53602**
Prep Date: **8/20/2018**	Analysis Date: **8/21/2018**	SeqNo: **1767540** 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-39888**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **39888**	RunNo: **53602**
Prep Date: **8/20/2018**	Analysis Date: **8/21/2018**	SeqNo: **1767541** 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	97.7	77.3	128			
Toluene	1.0	0.050	1.000	0	101	79.2	125			
Ethylbenzene	1.0	0.050	1.000	0	101	80.7	127			
Xylenes, Total	3.1	0.10	3.000	0	102	81.6	129			
Surr: 4-Bromofluorobenzene	1.0		1.000		105	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 Quanitative 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

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

Sample Log-In Check List

Client Name: HILCORP ENERGY Work Order Number: 1808B66 RcptNo: 1

Received By: Anne Thorne 8/18/2018 11:15:00 AM

Completed By: Ashley Gallegos 8/20/2018 9:46:47 AM

Reviewed By: 08/20/18 labeled by: JO 08/20/18

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? (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: 10 (<2 or >12 unless noted)

Adjusted? 8/20/18

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: ☐ 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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Client: Hilcorp Energy Company	Turn-Around Time: ☒ Standard ☐ Rush
Mailing Address:	Project Name: Standard #1
	Project #:
Phone #:	
email or Fax#: jdeal@hilcorp.com	Project Manager: Devin Hencmann LTE
QA/QC Package: ☒ Standard ☐ Level 4 (Full Validation)	
Accreditation ☐ NELAP ☐ Other	Sampler: Eric Carroll
☒ EDD (Type) PDF	On Ice: ☒ Yes ☐ No
	Sample Temperature: 2 / CF -1.0 = 1.1

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1808B006	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)
8/16/18	1600	soil	MW01 23-25'	1-4oz	cool	-001	X		X													
8/17/18	0930	soil	MW01 30-35'	1-4oz	cool	-002	X		X													

Date:	Time:	Relinquished by:	Received by:	Date	Time
8-17-18	16:25			8/17/18	1625
8/17/18	1839			08/18/18	1115

Remarks:
cc: dburns@ltenv.com
ecarroll@ltenv.com
dhencmann@ltenv.com
jdeal@hilcorp.com ccardoza@hilcorp.com

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

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

August 31, 2018

Devin Hencmann
LTE
848 East 2nd Avenue
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Standard 1 OrderNo.: 1808G06

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 3 sample(s) on 8/27/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1808G06**
Date Reported: **8/31/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Project: Standard 1
Lab ID: 1808G06-001 **Matrix:** SOIL

Client Sample ID: MW02 18-20'
Collection Date: 8/20/2018 12:30:00 PM
Received Date: 8/27/2018 7:48:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	37	9.8		mg/Kg	1	8/29/2018 1:39:29 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/29/2018 1:39:29 PM
Surr: DNOP	112	50.6-138		%Rec	1	8/29/2018 1:39:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	38	4.7		mg/Kg	1	8/29/2018 10:44:30 AM
Surr: BFB	192	15-316		%Rec	1	8/29/2018 10:44:30 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	0.046	0.023		mg/Kg	1	8/29/2018 10:44:30 AM
Toluene	0.64	0.047		mg/Kg	1	8/29/2018 10:44:30 AM
Ethylbenzene	0.26	0.047		mg/Kg	1	8/29/2018 10:44:30 AM
Xylenes, Total	2.9	0.093		mg/Kg	1	8/29/2018 10:44:30 AM
Surr: 4-Bromofluorobenzene	99.7	80-120		%Rec	1	8/29/2018 10:44:30 AM

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 Quanitative 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: LTE
Project: Standard 1
Lab ID: 1808G06-002 **Matrix:** SOIL

Client Sample ID: MW 02 23-25'
Collection Date: 8/20/2018 1:40:00 PM
Received Date: 8/27/2018 7:48:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/29/2018 2:02:05 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/29/2018 2:02:05 PM
Surr: DNOP	109	50.6-138		%Rec	1	8/29/2018 2:02:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/29/2018 12:17:51 PM
Surr: BFB	92.3	15-316		%Rec	1	8/29/2018 12:17:51 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	0.030	0.023		mg/Kg	1	8/29/2018 12:17:51 PM
Toluene	0.14	0.047		mg/Kg	1	8/29/2018 12:17:51 PM
Ethylbenzene	ND	0.047		mg/Kg	1	8/29/2018 12:17:51 PM
Xylenes, Total	ND	0.094		mg/Kg	1	8/29/2018 12:17:51 PM
Surr: 4-Bromofluorobenzene	93.5	80-120		%Rec	1	8/29/2018 12:17:51 PM

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 Quanitative 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: LTE
Project: Standard 1
Lab ID: 1808G06-003 **Matrix:** SOIL

Client Sample ID: MW06 21-23'
Collection Date: 8/22/2018 12:15:00 PM
Received Date: 8/27/2018 7:48:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	140	9.8		mg/Kg	1	8/29/2018 2:24:22 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/29/2018 2:24:22 PM
Surr: DNOP	119	50.6-138		%Rec	1	8/29/2018 2:24:22 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	950	97		mg/Kg	20	8/29/2018 9:57:35 AM
Surr: BFB	178	15-316		%Rec	20	8/29/2018 9:57:35 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	1.1	0.48		mg/Kg	20	8/29/2018 9:57:35 AM
Toluene	25	0.97		mg/Kg	20	8/29/2018 9:57:35 AM
Ethylbenzene	5.3	0.97		mg/Kg	20	8/29/2018 9:57:35 AM
Xylenes, Total	55	1.9		mg/Kg	20	8/29/2018 9:57:35 AM
Surr: 4-Bromofluorobenzene	97.5	80-120		%Rec	20	8/29/2018 9:57:35 AM

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

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 Quanitative 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#: **1808G06**

31-Aug-18

Client: LTE
Project: Standard 1

Sample ID **MB-40034**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **40034**	RunNo: **53774**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1774604** 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		106	50.6	138			

Sample ID **LCS-40034**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **40034**	RunNo: **53774**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1774605** 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	108	70	130			
Surr: DNOP	5.8		5.000		116	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 Quanitative 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#: **1808G06**

31-Aug-18

Client: LTE

Project: Standard 1

Sample ID **MB-40033**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775348** 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		90.5	15	316			

Sample ID **LCS-40033**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775349** 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	111	75.9	131			
Surr: BFB	1000		1000		101	15	316			

Sample ID **1808G06-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **MW02 18-20'**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775352** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	79	4.7	23.45	38.21	175	77.8	128			S
Surr: BFB	2300		938.1		244	15	316			

Sample ID **1808G06-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **MW02 18-20'**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775353** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	95	4.7	23.56	38.21	240	77.8	128	18.0	20	S
Surr: BFB	2800		942.5		296	15	316	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 Quanitative 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#: **1808G06**

31-Aug-18

Client: LTE
Project: Standard 1

Sample ID **MB-40033**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775384** 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	0.91		1.000		91.1	80	120			

Sample ID **LCS-40033**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775385** 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	96.2	77.3	128			
Toluene	0.99	0.050	1.000	0	98.7	79.2	125			
Ethylbenzene	0.99	0.050	1.000	0	98.6	80.7	127			
Xylenes, Total	3.0	0.10	3.000	0	99.6	81.6	129			
Surr: 4-Bromofluorobenzene	0.94		1.000		94.2	80	120			

Sample ID **1808G06-002AMS**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW 02 23-25'**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775389** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.024	0.9434	0.03024	102	68.5	133			
Toluene	1.1	0.047	0.9434	0.1417	106	75	130			
Ethylbenzene	1.0	0.047	0.9434	0.01479	109	79.4	128			
Xylenes, Total	3.2	0.094	2.830	0.08539	109	77.3	131			
Surr: 4-Bromofluorobenzene	0.89		0.9434		94.2	80	120			

Sample ID **1808G06-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW 02 23-25'**	Batch ID: **40033**	RunNo: **53798**
Prep Date: **8/28/2018**	Analysis Date: **8/29/2018**	SeqNo: **1775390** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.024	0.9681	0.03024	96.7	68.5	133	3.10	20	
Toluene	1.1	0.048	0.9681	0.1417	99.8	75	130	3.43	20	
Ethylbenzene	1.0	0.048	0.9681	0.01479	103	79.4	128	2.56	20	
Xylenes, Total	3.1	0.097	2.904	0.08539	104	77.3	131	2.14	20	
Surr: 4-Bromofluorobenzene	0.89		0.9681		91.9	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 Quanitative 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

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: LTE | Work Order Number: 1808G06 | RcptNo: 1

Received By: Jazzmine Burkhead 8/27/2018 7:48:00 AM

Completed By: Ashley Gallegos 8/27/2018 12:49:46 PM

Reviewed By: JB 8/27/18 labeled by: JAB 08/27/18

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? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
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 ☐	Checked by: JAB 08/27/18

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	4.6	Good	Yes			

Chain-of-Custody Record

Client: Lt Environmental

Mailing Address: 848 w 2nd Ave
Durango CO. 81301

Phone #: 970-385-1096

email or Fax#: dhencmann@ltenv.com

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

Accreditation
☐ NELAP ☐ Other _____

☑ EDD (Type) PDF

Turn-Around Time:
☑ Standard ☐ Rush _____

Project Name: Standard #1

Project #:

Project Manager: Devin Hencmann

Sampler: Eric Carroll

On Ice: ☑ Yes ☐ No

Sample Temperature: 4.6

HALL ANALYS
www.hallenvir
4901 Hawkins NE - Albu
Tel. 505-345-3975 Fa

Analys

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1808G06	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 Metals	
8/20	1345	Soil	MW02 18-20'	1402	Cool	-001	X		X					
8/20	1340	↓	MW02 23-25'	↓	↓	-002	X		X					
8/22	1215	—	MW06 21-23'	↓	↓	-003	X		X					

Date:	Time:	Relinquished by:	Received by:	Date Time	Remarks:
8/23	1430		Christ Valt	8/23/18 1430	Please cc: db
8/23/18	1901	Christ Valt		08/24/18 07:45	

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 c

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 09, 2018

Danny Burns
Hilcorp Energy
PO Box PO Box 4700
Farmington, NM 84701
TEL:
FAX

RE: Standard 1 OrderNo.: 1810389

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 2 sample(s) on 10/6/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1810389**
Date Reported: **10/9/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1810389-001 **Matrix:** SOIL

Client Sample ID: MW-04 @ 25-27'
Collection Date: 10/5/2018 4:45:00 PM
Received Date: 10/6/2018 10:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	330	9.9		mg/Kg	1	10/8/2018 11:18:24 AM
Motor Oil Range Organics (MRO)	120	50		mg/Kg	1	10/8/2018 11:18:24 AM
Surr: DNOP	119	50.6-138		%Rec	1	10/8/2018 11:18:24 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	150	19		mg/Kg	5	10/8/2018 9:38:16 AM
Surr: BFB	243	15-316		%Rec	5	10/8/2018 9:38:16 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	0.11	0.096		mg/Kg	5	10/8/2018 9:38:16 AM
Toluene	0.82	0.19		mg/Kg	5	10/8/2018 9:38:16 AM
Ethylbenzene	0.31	0.19		mg/Kg	5	10/8/2018 9:38:16 AM
Xylenes, Total	3.2	0.38		mg/Kg	5	10/8/2018 9:38:16 AM
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	5	10/8/2018 9:38:16 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810389-002 **Matrix:** SOIL

Client Sample ID: MW-03 @ 30-32'
Collection Date: 10/5/2018 1:15:00 PM
Received Date: 10/6/2018 10:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	10	9.9		mg/Kg	1	10/8/2018 11:40:28 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/8/2018 11:40:28 AM
Surr: DNOP	110	50.6-138		%Rec	1	10/8/2018 11:40:28 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	120	23		mg/Kg	5	10/8/2018 10:24:56 AM
Surr: BFB	147	15-316		%Rec	5	10/8/2018 10:24:56 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	0.24	0.11		mg/Kg	5	10/8/2018 10:24:56 AM
Toluene	1.7	0.23		mg/Kg	5	10/8/2018 10:24:56 AM
Ethylbenzene	0.42	0.23		mg/Kg	5	10/8/2018 10:24:56 AM
Xylenes, Total	4.4	0.46		mg/Kg	5	10/8/2018 10:24:56 AM
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	5	10/8/2018 10:24:56 AM

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 Quanitative 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#: **1810389**

09-Oct-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID **MB-40867**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **40867**	RunNo: **54707**
Prep Date: **10/8/2018**	Analysis Date: **10/8/2018**	SeqNo: **1815572** 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		107	50.6	138			

Sample ID **MB-40867**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **40867**	RunNo: **54707**
Prep Date: **10/8/2018**	Analysis Date: **10/8/2018**	SeqNo: **1815573** 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		113	50.6	138			

Sample ID **LCS-40867**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **40867**	RunNo: **54707**
Prep Date: **10/8/2018**	Analysis Date: **10/8/2018**	SeqNo: **1815574** 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	94.1	70	130			
Surr: DNOP	5.1		5.000		102	50.6	138			

Sample ID **1810389-002AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW-03 @ 30-32'**	Batch ID: **40867**	RunNo: **54707**
Prep Date: **10/8/2018**	Analysis Date: **10/8/2018**	SeqNo: **1815715** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	9.8	49.21	10.22	89.4	53.5	126			
Surr: DNOP	5.4		4.921		109	50.6	138			

Sample ID **1810389-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW-03 @ 30-32'**	Batch ID: **40867**	RunNo: **54707**
Prep Date: **10/8/2018**	Analysis Date: **10/8/2018**	SeqNo: **1815716** 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	10.22	93.4	53.5	126	4.80	21.7	
Surr: DNOP	5.6		4.995		112	50.6	138	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 Quanitative 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#: **1810389**

09-Oct-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID	**MB-40841**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBS**	Batch ID:	**40841**	RunNo:	**54705**
Prep Date:	**10/5/2018**	Analysis Date:	**10/8/2018**	SeqNo:	**1815940** 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		90.8	15	316			

Sample ID	**LCS-40841**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSS**	Batch ID:	**40841**	RunNo:	**54705**
Prep Date:	**10/5/2018**	Analysis Date:	**10/8/2018**	SeqNo:	**1815941** 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	100	75.9	131			
Surr: BFB	1100		1000		106	15	316			

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 Quanitative 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#: **1810389**

09-Oct-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID **MB-40841**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **40841**	RunNo: **54705**
Prep Date: **10/5/2018**	Analysis Date: **10/8/2018**	SeqNo: **1815960** 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	0.98		1.000		98.0	80	120			

Sample ID **LCS-40841**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **40841**	RunNo: **54705**
Prep Date: **10/5/2018**	Analysis Date: **10/8/2018**	SeqNo: **1815961** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	90.7	77.3	128			
Toluene	0.97	0.050	1.000	0	97.1	79.2	125			
Ethylbenzene	0.97	0.050	1.000	0	97.4	80.7	127			
Xylenes, Total	2.9	0.10	3.000	0	97.8	81.6	129			
Surr: 4-Bromofluorobenzene	1.0		1.000		102	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 Quanitative 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

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: HILCORP ENERGY Work Order Number: 1810389 RcptNo: 1

Received By: Jazzmine Burkhead 10/6/2018 10:00:00 AM Jazzmine Burkhead

Completed By: Anne Thorne 10/8/2018 7:11:20 AM Anne Thorne

Reviewed By: DB 10/8/18

Labeled by: AT 10/08/18

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? (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 °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.0	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp Energy
Jennifer Deal
Mailing Address: 848 East 2nd Ave.
Durango, CO, 81301
Phone #: 970-385-1096
email or Fax#: DBurns@ltenv.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☒ Rush 24 hr TAT
Project Name: Standard #1
Project #: 07817006
Project Manager: Daniel Burns
Sampler: Josh Adams
On Ice: ☑ Yes ☐ No
Sample Temperature: 5.0 -0.4(c) = 5

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and # (At 10/8/18: MeoHKit)	Preservative Type	HEAL No. 810389	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)
10/5/18	16:45	S	MW-04 @ 25-27'	1-8 oz jar	none	201	X		X									
10/5/18	13:45	S	MW-03 @ 30-32'	1-8 oz jar	none	202	X		X									

NFS

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date Time	Remarks:
10-5-18	1748			10/5/18 1748	cc dburns@ltenv.com aauger@ltenv.com
10/5/18	1811			10/06/18 10:00	

Courier

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

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

October 16, 2018

Jennifer Deal

Hilcorp Energy
PO Box PO Box 4700
Farmington, NM 84701
TEL:
FAX

RE: Standard 1 OrderNo.: 1810699

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 12 sample(s) on 10/10/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1810699**
Date Reported: **10/16/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-001 **Matrix:** SOIL

Client Sample ID: MW10 @ 33'-35'
Collection Date: 10/4/2018 5:00:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	93	9.6		mg/Kg	1	10/15/2018 4:43:44 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/15/2018 4:43:44 PM
Surr: DNOP	98.6	50.6-138		%Rec	1	10/15/2018 4:43:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	360	23		mg/Kg	5	10/13/2018 2:48:39 AM
Surr: BFB	327	15-316	S	%Rec	5	10/13/2018 2:48:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	0.53	0.12		mg/Kg	5	10/13/2018 2:48:39 AM
Toluene	8.2	0.23		mg/Kg	5	10/13/2018 2:48:39 AM
Ethylbenzene	2.1	0.23		mg/Kg	5	10/13/2018 2:48:39 AM
Xylenes, Total	19	0.46		mg/Kg	5	10/13/2018 2:48:39 AM
Surr: 4-Bromofluorobenzene	114	80-120		%Rec	5	10/13/2018 2:48:39 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-002 **Matrix:** SOIL

Client Sample ID: MW10 @ 38'-40'
Collection Date: 10/4/2018 5:05:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/15/2018 5:49:50 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/15/2018 5:49:50 PM
Surr: DNOP	98.0	50.6-138		%Rec	1	10/15/2018 5:49:50 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/13/2018 3:11:26 AM
Surr: BFB	91.9	15-316		%Rec	1	10/13/2018 3:11:26 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.023		mg/Kg	1	10/13/2018 3:11:26 AM
Toluene	ND	0.047		mg/Kg	1	10/13/2018 3:11:26 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/13/2018 3:11:26 AM
Xylenes, Total	ND	0.093		mg/Kg	1	10/13/2018 3:11:26 AM
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	10/13/2018 3:11:26 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-003 **Matrix:** SOIL

Client Sample ID: MW-4 @ 39'-40'
Collection Date: 10/5/2018 4:47:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/15/2018 6:11:43 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/15/2018 6:11:43 PM
Surr: DNOP	95.3	50.6-138		%Rec	1	10/15/2018 6:11:43 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/13/2018 3:34:09 AM
Surr: BFB	88.3	15-316		%Rec	1	10/13/2018 3:34:09 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/13/2018 3:34:09 AM
Toluene	ND	0.049		mg/Kg	1	10/13/2018 3:34:09 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/13/2018 3:34:09 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/13/2018 3:34:09 AM
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	10/13/2018 3:34:09 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-004 **Matrix:** SOIL

Client Sample ID: MW-3 @ 43'-45'
Collection Date: 10/5/2018 1:30:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/15/2018 6:33:43 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/15/2018 6:33:43 PM
Surr: DNOP	98.4	50.6-138		%Rec	1	10/15/2018 6:33:43 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/13/2018 3:56:47 AM
Surr: BFB	92.1	15-316		%Rec	1	10/13/2018 3:56:47 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.024		mg/Kg	1	10/13/2018 3:56:47 AM
Toluene	ND	0.048		mg/Kg	1	10/13/2018 3:56:47 AM
Ethylbenzene	ND	0.048		mg/Kg	1	10/13/2018 3:56:47 AM
Xylenes, Total	ND	0.096		mg/Kg	1	10/13/2018 3:56:47 AM
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	10/13/2018 3:56:47 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-005 **Matrix:** SOIL

Client Sample ID: MW-11 @ 15'-17'
Collection Date: 10/6/2018 12:00:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/15/2018 6:55:33 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/15/2018 6:55:33 PM
Surr: DNOP	94.0	50.6-138		%Rec	1	10/15/2018 6:55:33 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	28	4.7		mg/Kg	1	10/13/2018 2:13:14 AM
Surr: BFB	208	15-316		%Rec	1	10/13/2018 2:13:14 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.024		mg/Kg	1	10/13/2018 2:13:14 AM
Toluene	0.060	0.047		mg/Kg	1	10/13/2018 2:13:14 AM
Ethylbenzene	0.094	0.047		mg/Kg	1	10/13/2018 2:13:14 AM
Xylenes, Total	1.2	0.095		mg/Kg	1	10/13/2018 2:13:14 AM
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	10/13/2018 2:13:14 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-006 **Matrix:** SOIL

Client Sample ID: MW-11 @ 39-40'
Collection Date: 10/6/2018 12:05:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/15/2018 7:17:30 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/15/2018 7:17:30 PM
Surr: DNOP	98.0	50.6-138		%Rec	1	10/15/2018 7:17:30 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/13/2018 2:36:41 AM
Surr: BFB	90.8	15-316		%Rec	1	10/13/2018 2:36:41 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.024		mg/Kg	1	10/13/2018 2:36:41 AM
Toluene	ND	0.049		mg/Kg	1	10/13/2018 2:36:41 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/13/2018 2:36:41 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/13/2018 2:36:41 AM
Surr: 4-Bromofluorobenzene	95.7	80-120		%Rec	1	10/13/2018 2:36:41 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-007 **Matrix:** SOIL

Client Sample ID: MW-09 @ 15'-17'
Collection Date: 10/6/2018 5:40:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	36	9.2		mg/Kg	1	10/15/2018 7:39:18 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/15/2018 7:39:18 PM
Surr: DNOP	99.7	50.6-138		%Rec	1	10/15/2018 7:39:18 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	430	23		mg/Kg	5	10/13/2018 3:00:10 AM
Surr: BFB	267	15-316		%Rec	5	10/13/2018 3:00:10 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	0.25	0.12		mg/Kg	5	10/13/2018 3:00:10 AM
Toluene	3.0	0.23		mg/Kg	5	10/13/2018 3:00:10 AM
Ethylbenzene	1.5	0.23		mg/Kg	5	10/13/2018 3:00:10 AM
Xylenes, Total	17	0.47		mg/Kg	5	10/13/2018 3:00:10 AM
Surr: 4-Bromofluorobenzene	108	80-120		%Rec	5	10/13/2018 3:00:10 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-008 **Matrix:** SOIL

Client Sample ID: MW-09 @ 42'-43'
Collection Date: 10/6/2018 5:45:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	10/15/2018 8:23:02 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/15/2018 8:23:02 PM
Surr: DNOP	99.6	50.6-138		%Rec	1	10/15/2018 8:23:02 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/13/2018 3:23:29 AM
Surr: BFB	90.6	15-316		%Rec	1	10/13/2018 3:23:29 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.023		mg/Kg	1	10/13/2018 3:23:29 AM
Toluene	ND	0.047		mg/Kg	1	10/13/2018 3:23:29 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/13/2018 3:23:29 AM
Xylenes, Total	ND	0.094		mg/Kg	1	10/13/2018 3:23:29 AM
Surr: 4-Bromofluorobenzene	95.4	80-120		%Rec	1	10/13/2018 3:23:29 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-009 **Matrix:** SOIL

Client Sample ID: MW5 @ 21'-23'
Collection Date: 10/8/2018 10:40:00 AM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/15/2018 8:45:03 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/15/2018 8:45:03 PM
Surr: DNOP	95.6	50.6-138		%Rec	1	10/15/2018 8:45:03 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/13/2018 3:47:06 AM
Surr: BFB	94.7	15-316		%Rec	1	10/13/2018 3:47:06 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.024		mg/Kg	1	10/13/2018 3:47:06 AM
Toluene	ND	0.048		mg/Kg	1	10/13/2018 3:47:06 AM
Ethylbenzene	ND	0.048		mg/Kg	1	10/13/2018 3:47:06 AM
Xylenes, Total	ND	0.096		mg/Kg	1	10/13/2018 3:47:06 AM
Surr: 4-Bromofluorobenzene	96.8	80-120		%Rec	1	10/13/2018 3:47:06 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-010 **Matrix:** SOIL

Client Sample ID: MW5 @ 33'-35'
Collection Date: 10/8/2018 10:45:00 AM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/15/2018 9:06:46 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/15/2018 9:06:46 PM
Surr: DNOP	98.4	50.6-138		%Rec	1	10/15/2018 9:06:46 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	10/13/2018 4:10:37 AM
Surr: BFB	91.0	15-316		%Rec	1	10/13/2018 4:10:37 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.023		mg/Kg	1	10/13/2018 4:10:37 AM
Toluene	ND	0.046		mg/Kg	1	10/13/2018 4:10:37 AM
Ethylbenzene	ND	0.046		mg/Kg	1	10/13/2018 4:10:37 AM
Xylenes, Total	ND	0.092		mg/Kg	1	10/13/2018 4:10:37 AM
Surr: 4-Bromofluorobenzene	96.0	80-120		%Rec	1	10/13/2018 4:10:37 AM

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 Quanitative 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

Analytical Report
Lab Order **1810699**
Date Reported: **10/16/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-011 **Matrix:** SOIL

Client Sample ID: MW12 @ 17'-19'
Collection Date: 10/8/2018 3:40:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	130	9.2		mg/Kg	1	10/15/2018 9:28:37 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/15/2018 9:28:37 PM
Surr: DNOP	98.0	50.6-138		%Rec	1	10/15/2018 9:28:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	1300	230		mg/Kg	50	10/13/2018 4:34:07 AM
Surr: BFB	132	15-316		%Rec	50	10/13/2018 4:34:07 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	1.7	1.2		mg/Kg	50	10/13/2018 4:34:07 AM
Toluene	19	2.3		mg/Kg	50	10/13/2018 4:34:07 AM
Ethylbenzene	6.0	2.3		mg/Kg	50	10/13/2018 4:34:07 AM
Xylenes, Total	57	4.6		mg/Kg	50	10/13/2018 4:34:07 AM
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	50	10/13/2018 4:34:07 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810699-012 **Matrix:** SOIL

Client Sample ID: MW12 @ 29'-30'
Collection Date: 10/8/2018 3:45:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/15/2018 9:50:32 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/15/2018 9:50:32 PM
Surr: DNOP	100	50.6-138		%Rec	1	10/15/2018 9:50:32 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/13/2018 4:57:32 AM
Surr: BFB	90.9	15-316		%Rec	1	10/13/2018 4:57:32 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.024		mg/Kg	1	10/13/2018 4:57:32 AM
Toluene	ND	0.049		mg/Kg	1	10/13/2018 4:57:32 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/13/2018 4:57:32 AM
Xylenes, Total	ND	0.097		mg/Kg	1	10/13/2018 4:57:32 AM
Surr: 4-Bromofluorobenzene	96.2	80-120		%Rec	1	10/13/2018 4:57:32 AM

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 Quanitative 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#: **1810699**

16-Oct-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID **LCS-40978** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **40978** RunNo: **54866**
Prep Date: **10/12/2018** Analysis Date: **10/15/2018** SeqNo: **1823620** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	10	50.00	0	83.4	70	130			
Surr: DNOP	4.7		5.000		94.0	50.6	138			

Sample ID **MB-40978** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **40978** RunNo: **54866**
Prep Date: **10/12/2018** Analysis Date: **10/15/2018** SeqNo: **1823621** 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		95.9	50.6	138			

Sample ID **1810699-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW10 @ 33'-35'** Batch ID: **40978** RunNo: **54866**
Prep Date: **10/12/2018** Analysis Date: **10/15/2018** SeqNo: **1824372** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	98	9.9	49.26	93.45	9.38	53.5	126			S
Surr: DNOP	4.4		4.926		88.8	50.6	138			

Sample ID **1810699-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW10 @ 33'-35'** Batch ID: **40978** RunNo: **54866**
Prep Date: **10/12/2018** Analysis Date: **10/15/2018** SeqNo: **1824373** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	110	9.7	48.64	93.45	29.1	53.5	126	9.26	21.7	S
Surr: DNOP	4.7		4.864		97.3	50.6	138	0	0	

Sample ID **LCS-40976** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **40976** RunNo: **54866**
Prep Date: **10/12/2018** Analysis Date: **10/15/2018** SeqNo: **1824398** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.6		5.000		92.7	50.6	138			

Sample ID **MB-40976** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **40976** RunNo: **54866**
Prep Date: **10/12/2018** Analysis Date: **10/15/2018** SeqNo: **1824399** Units: **%Rec**

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 Quanitative 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#: **1810699**

16-Oct-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID	**MB-40976**	SampType:	**MBLK**	TestCode:	**EPA Method 8015M/D: Diesel Range Organics**
Client ID:	**PBS**	Batch ID:	**40976**	RunNo:	**54866**
Prep Date:	**10/12/2018**	Analysis Date:	**10/15/2018**	SeqNo:	**1824399** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.4		10.00		94.2	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 Quanitative 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#: **1810699**

16-Oct-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID **LCS-40965**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **40965**	RunNo: **54834**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1822840** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	92.6	75.9	131			
Surr: BFB	1000		1000		100	15	316			

Sample ID **MB-40965**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **40965**	RunNo: **54834**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1822841** 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		86.7	15	316			

Sample ID **LCS-40955**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **40955**	RunNo: **54829**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1823271** 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	89.4	75.9	131			
Surr: BFB	1100		1000		105	15	316			

Sample ID **MB-40955**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **40955**	RunNo: **54829**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1823272** 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	15	316			

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 Quanitative 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#: **1810699**

16-Oct-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID **LCS-40965** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **40965** RunNo: **54834**
Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1822881** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	91.2	77.3	128			
Toluene	0.96	0.050	1.000	0	96.0	79.2	125			
Ethylbenzene	0.95	0.050	1.000	0	94.9	80.7	127			
Xylenes, Total	2.9	0.10	3.000	0	96.8	81.6	129			
Surr: 4-Bromofluorobenzene	0.96		1.000		96.3	80	120			

Sample ID **MB-40965** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **40965** RunNo: **54834**
Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1822882** 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	0.92		1.000		92.0	80	120			

Sample ID **LCS-40955** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **40955** RunNo: **54829**
Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1823414** 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	108	77.3	128			
Toluene	1.1	0.050	1.000	0	110	79.2	125			
Ethylbenzene	1.1	0.050	1.000	0	106	80.7	127			
Xylenes, Total	3.1	0.10	3.000	0	104	81.6	129			
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Sample ID **MB-40955** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **40955** RunNo: **54829**
Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1823415** 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	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 Quanitative 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

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: HILCORP ENERGY Work Order Number: 1810699 RcptNo: 1

Received By: Victoria Zellar 10/10/2018 8:00:00 AM Victoria Zellar

Completed By: Anne Thorne 10/11/2018 1:26:07 PM Anne Thorne

Reviewed By: JAB 10/11/18

Labeled by: IO 10/11/18

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? (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: IO 10/11/18 (<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:	Hilcorp Energy L48 West
	Jennifer Deal
Mailing Address:	
Phone #:	505-324-5128
email or Fax#:	jdeal@hilcorp.com
QA/QC Package:	
X Standard	☐ Level 4 (Full Validation)
Accreditation:	
☐ NELAP	☐ Other
X EDD (Type)	PDF

Turn-Around Time:	
X Standard	☐ Rush
Project Name:	Standard #1
Project #:	01787006
Project Manager:	Jennifer Deal - Hilcorp Danny Burns - LTE
Sampler:	Josh Adams & Mary Mrdjenovich
On Ice:	☑ Yes ☐ No
Sample Temperature:	2.1 - (.1) 1.0 = 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1810699	BTEX (8021)	TPH 8015B (GRO/DRO/MRO)	Air Bubbles (Y or N)
10/4/2018	17:00	Soil	MW10 @ 33'-35'	1 4oz	Cool	701	x	x	
10/4/2018	17:05	Soil	MW10 @ 38'-40'	1 4oz	Cool	702	x	x	
10/5/2018	16:47	Soil	MW-4 @39'-40'	1 4oz	Cool	703	x	x	
10/5/2018	13:30	Soil	MW-3 @43'-45'	1 4oz	Cool	704	x	x	
10/6/2018	12:00	Soil	MW-11 @15'-17'	2 4oz	Cool	705	x	x	
10/6/2018	12:05	Soil	MW-11 @39'-40'	2 4oz	Cool	706	x	x	
10/6/2018	17:40	Soil	MW -09 @ 15'-17'	2 4oz	Cool	707	x	x	
10/6/2018	17:45	Soil	MW-09 @ 42'-43'	2 4oz	Cool	708	x	x	
10/8/2018	10:40	Soil	MW5 @ 21'-23'	2 4oz	Cool	709	x	x	
10/8/2018	10:45	Soil	MW5 @ 33'-35'	2 4oz	Cool	710	x	x	
10/8/2018	15:40	Soil	MW12 @17'-19'	1 4oz	Cool	711	x	x	
10/8/2018	15:45	Soil	MW12 @ 29'-30'	1 4oz	Cool	712	x	x	

Date	Time	Relinquished by:	Received by:	Date	Time
10-9-18	1633			10/9/18	1633
10/9/18	1947		Courier via 10/10/18 8:00	10/10/18	8:00

Remarks: Please CC: dburns@ltenv.com

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

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

October 16, 2018

Danny Burns
Hilcorp Energy
PO Box 61529
Houston, TX 77208-1529
TEL: (337) 276-7676
FAX

RE: Standard 1 OrderNo.: 1810573

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 2 sample(s) on 10/10/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1810573**
Date Reported: **10/16/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1810573-001 **Matrix:** SOIL

Client Sample ID: MW 7 @ 18-20'
Collection Date: 10/9/2018 3:50:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/12/2018 7:17:06 PM	40958
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/12/2018 7:17:06 PM	40958
Surr: DNOP	103	50.6-138		%Rec	1	10/12/2018 7:17:06 PM	40958
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/11/2018 10:35:41 PM	40915
Surr: BFB	86.0	15-316		%Rec	1	10/11/2018 10:35:41 PM	40915
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	10/11/2018 10:35:41 PM	40915
Toluene	ND	0.050		mg/Kg	1	10/11/2018 10:35:41 PM	40915
Ethylbenzene	ND	0.050		mg/Kg	1	10/11/2018 10:35:41 PM	40915
Xylenes, Total	ND	0.099		mg/Kg	1	10/11/2018 10:35:41 PM	40915
Surr: 4-Bromofluorobenzene	93.0	80-120		%Rec	1	10/11/2018 10:35:41 PM	40915

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810573-002 **Matrix:** SOIL

Client Sample ID: MW 7 @ 31-32'
Collection Date: 10/9/2018 3:55:00 PM
Received Date: 10/10/2018 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/12/2018 7:41:31 PM	40958
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/12/2018 7:41:31 PM	40958
Surr: DNOP	106	50.6-138		%Rec	1	10/12/2018 7:41:31 PM	40958
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/11/2018 10:58:59 PM	40915
Surr: BFB	89.4	15-316		%Rec	1	10/11/2018 10:58:59 PM	40915
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	10/11/2018 10:58:59 PM	40915
Toluene	ND	0.048		mg/Kg	1	10/11/2018 10:58:59 PM	40915
Ethylbenzene	ND	0.048		mg/Kg	1	10/11/2018 10:58:59 PM	40915
Xylenes, Total	ND	0.096		mg/Kg	1	10/11/2018 10:58:59 PM	40915
Surr: 4-Bromofluorobenzene	96.8	80-120		%Rec	1	10/11/2018 10:58:59 PM	40915

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 Quanitative 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#: **1810573**

16-Oct-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID **LCS-40958**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **40958**	RunNo: **54841**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1823156** 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	98.0	70	130			
Surr: DNOP	5.2		5.000		104	50.6	138			

Sample ID **MB-40958**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **40958**	RunNo: **54841**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1823157** 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		99.7	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 Quanitative 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#: **1810573**

16-Oct-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID **LCS-40915**	SampType: **LCS**			TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID: **LCSS**	Batch ID: **40915**			RunNo: **54814**					
Prep Date: **10/10/2018**	Analysis Date: **10/11/2018**			SeqNo: **1820394**		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		107	15	316			

Sample ID **MB-40915**	SampType: **MBLK**			TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID: **PBS**	Batch ID: **40915**			RunNo: **54814**					
Prep Date: **10/10/2018**	Analysis Date: **10/11/2018**			SeqNo: **1821138**		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		90.6	15	316			

Sample ID **LCS-40965**	SampType: **LCS**			TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID: **LCSS**	Batch ID: **40965**			RunNo: **54834**					
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**			SeqNo: **1822840**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1000		1000		100	15	316			

Sample ID **MB-40965**	SampType: **MBLK**			TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID: **PBS**	Batch ID: **40965**			RunNo: **54834**					
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**			SeqNo: **1822841**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	870		1000		86.7	15	316			

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 Quanitative 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#: **1810573**

16-Oct-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID **LCS-40915** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **40915** RunNo: **54814**

Prep Date: **10/10/2018** Analysis Date: **10/11/2018** SeqNo: **1820396** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	96.6	77.3	128			
Toluene	1.0	0.050	1.000	0	102	79.2	125			
Ethylbenzene	1.0	0.050	1.000	0	101	80.7	127			
Xylenes, Total	3.1	0.10	3.000	0	102	81.6	129			
Surr: 4-Bromofluorobenzene	0.96		1.000		96.4	80	120			

Sample ID **MB-40915** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **40915** RunNo: **54814**

Prep Date: **10/10/2018** Analysis Date: **10/11/2018** SeqNo: **1821178** 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	0.98		1.000		97.7	80	120			

Sample ID **LCS-40965** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **40965** RunNo: **54834**

Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1822881** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.96		1.000		96.3	80	120			

Sample ID **MB-40965** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **40965** RunNo: **54834**

Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1822882** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.92		1.000		92.0	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 Quanitative 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

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: HILCORP ENERGY Work Order Number: 1810573 RcptNo: 1

Received By: Victoria Zellar 10/10/2018 8:00:00 AM Victoria Zellar

Completed By: Ashley Gallegos 10/10/2018 10:46:33 AM

Reviewed By: 10/10/18 labeled by: JAB 10/10/18

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 ☑	# of preserved bottles checked for pH:
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	(<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
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 ☐	Checked by: JAB 10/10/18

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	1.1	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp Energy L48 west
Jennifer Deal

Mailing Address:

Phone #: 505-324-5128

email or Fax#: jdeal@Hilcorp.com

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

Accreditation
☐ NELAP ☐ Other

☒ EDD (Type) PDF

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Standard #1

Project #: 01781706

Project Manager: Danny Burns

Sampler: Josh Adams

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.1+(0)1.0 = 1.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1810573	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)
10-9-18	1550	soil	MW7E18-20'	(1) 4oz	cool	-001	X		X													
↓	1555	↓	MW7E31-32'	↓	↓	-002	X		X													

Date	Time	Relinquished by:	Received by:	Date	Time
10-9-18	1633			10/9/18	1633
10/9/18	1947		Corrected WZ 10/10/18 8:00	10/10/18	8:00

Remarks: cc: dburns@hilcorp.com
aager@hilcorp.com

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

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

October 16, 2018

Danny Burns
Hilcorp Energy
PO Box PO Box 4700
Farmington, NM 84701
TEL:
FAX

RE: Standard 1 OrderNo.: 1810653

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 6 sample(s) on 10/11/2018 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1810653**
Date Reported: **10/16/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1810653-001 **Matrix:** SOIL

Client Sample ID: MW8 @ 30-32'
Collection Date: 10/10/2018 9:00:00 AM
Received Date: 10/11/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	10/12/2018 9:18:50 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/12/2018 9:18:50 PM
Surr: DNOP	111	50.6-138		%Rec	1	10/12/2018 9:18:50 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/12/2018 10:39:29 PM
Surr: BFB	96.2	15-316		%Rec	1	10/12/2018 10:39:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	0.037	0.024		mg/Kg	1	10/12/2018 10:39:29 PM
Toluene	0.076	0.047		mg/Kg	1	10/12/2018 10:39:29 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/12/2018 10:39:29 PM
Xylenes, Total	ND	0.095		mg/Kg	1	10/12/2018 10:39:29 PM
Surr: 4-Bromofluorobenzene	108	80-120		%Rec	1	10/12/2018 10:39:29 PM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810653-002 **Matrix:** SOIL

Client Sample ID: MW8 @ 34-35'
Collection Date: 10/10/2018 9:05:00 AM
Received Date: 10/11/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/12/2018 9:43:16 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/12/2018 9:43:16 PM
Surr: DNOP	103	50.6-138		%Rec	1	10/12/2018 9:43:16 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/13/2018 12:32:32 AM
Surr: BFB	92.9	15-316		%Rec	1	10/13/2018 12:32:32 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.023		mg/Kg	1	10/13/2018 12:32:32 AM
Toluene	ND	0.047		mg/Kg	1	10/13/2018 12:32:32 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/13/2018 12:32:32 AM
Xylenes, Total	ND	0.094		mg/Kg	1	10/13/2018 12:32:32 AM
Surr: 4-Bromofluorobenzene	107	80-120		%Rec	1	10/13/2018 12:32:32 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810653-003 **Matrix:** SOIL

Client Sample ID: MW13 @ 6-8'
Collection Date: 10/10/2018 12:15:00 PM
Received Date: 10/11/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/12/2018 10:07:37 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/12/2018 10:07:37 PM
Surr: DNOP	101	50.6-138		%Rec	1	10/12/2018 10:07:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/13/2018 12:55:15 AM
Surr: BFB	93.4	15-316		%Rec	1	10/13/2018 12:55:15 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.024		mg/Kg	1	10/13/2018 12:55:15 AM
Toluene	ND	0.047		mg/Kg	1	10/13/2018 12:55:15 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/13/2018 12:55:15 AM
Xylenes, Total	ND	0.094		mg/Kg	1	10/13/2018 12:55:15 AM
Surr: 4-Bromofluorobenzene	108	80-120		%Rec	1	10/13/2018 12:55:15 AM

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

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 Quanitative 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, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1810653-004 **Matrix:** SOIL

Client Sample ID: MW13 @ 34-35'
Collection Date: 10/10/2018 12:20:00 PM
Received Date: 10/11/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/12/2018 10:32:02 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/12/2018 10:32:02 PM
Surr: DNOP	93.9	50.6-138		%Rec	1	10/12/2018 10:32:02 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/13/2018 1:17:53 AM
Surr: BFB	93.6	15-316		%Rec	1	10/13/2018 1:17:53 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.023		mg/Kg	1	10/13/2018 1:17:53 AM
Toluene	ND	0.047		mg/Kg	1	10/13/2018 1:17:53 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/13/2018 1:17:53 AM
Xylenes, Total	ND	0.093		mg/Kg	1	10/13/2018 1:17:53 AM
Surr: 4-Bromofluorobenzene	108	80-120		%Rec	1	10/13/2018 1:17:53 AM

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 Quanitative 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: Hilcorp Energy
Project: Standard 1
Lab ID: 1810653-005 **Matrix:** SOIL

Client Sample ID: MW14 @ 24-26'
Collection Date: 10/10/2018 4:30:00 PM
Received Date: 10/11/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/12/2018 10:56:17 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/12/2018 10:56:17 PM
Surr: DNOP	107	50.6-138		%Rec	1	10/12/2018 10:56:17 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/13/2018 1:40:32 AM
Surr: BFB	101	15-316		%Rec	1	10/13/2018 1:40:32 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.024		mg/Kg	1	10/13/2018 1:40:32 AM
Toluene	ND	0.047		mg/Kg	1	10/13/2018 1:40:32 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/13/2018 1:40:32 AM
Xylenes, Total	ND	0.095		mg/Kg	1	10/13/2018 1:40:32 AM
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	10/13/2018 1:40:32 AM

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

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 Quanitative 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, Inc.

CLIENT: Hilcorp Energy
Project: Standard 1
Lab ID: 1810653-006 **Matrix:** SOIL

Client Sample ID: MW14 @ 32-34'
Collection Date: 10/10/2018 4:45:00 PM
Received Date: 10/11/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **lrm**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	10/12/2018 11:20:42 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/12/2018 11:20:42 PM
Surr: DNOP	105	50.6-138		%Rec	1	10/12/2018 11:20:42 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	10/13/2018 2:03:13 AM
Surr: BFB	91.1	15-316		%Rec	1	10/13/2018 2:03:13 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.023		mg/Kg	1	10/13/2018 2:03:13 AM
Toluene	ND	0.046		mg/Kg	1	10/13/2018 2:03:13 AM
Ethylbenzene	ND	0.046		mg/Kg	1	10/13/2018 2:03:13 AM
Xylenes, Total	ND	0.092		mg/Kg	1	10/13/2018 2:03:13 AM
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	1	10/13/2018 2:03:13 AM

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 Quanitative 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#: **1810653**

16-Oct-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID **LCS-40958**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **40958**	RunNo: **54841**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1823156** 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	98.0	70	130			
Surr: DNOP	5.2		5.000		104	50.6	138			

Sample ID **MB-40958**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **40958**	RunNo: **54841**
Prep Date: **10/11/2018**	Analysis Date: **10/12/2018**	SeqNo: **1823157** 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		99.7	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 Quanitative 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#: **1810653**

16-Oct-18

Client: Hilcorp Energy
Project: Standard 1

Sample ID	**LCS-40955**	SampType: **LCS**			TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSS**	Batch ID: **40955**			RunNo: **54829**					
Prep Date:	**10/11/2018**	Analysis Date: **10/12/2018**			SeqNo: **1823271**		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	89.4	75.9	131			
Surr: BFB		1100		1000		105	15	316			

Sample ID	**MB-40955**	SampType: **MBLK**			TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID:	**PBS**	Batch ID: **40955**			RunNo: **54829**					
Prep Date:	**10/11/2018**	Analysis Date: **10/12/2018**			SeqNo: **1823272**		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	15	316			

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 Quanitative 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#: **1810653**

16-Oct-18

Client: Hilcorp Energy

Project: Standard 1

Sample ID **LCS-40955** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **40955** RunNo: **54829**

Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1823414** 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	108	77.3	128			
Toluene	1.1	0.050	1.000	0	110	79.2	125			
Ethylbenzene	1.1	0.050	1.000	0	106	80.7	127			
Xylenes, Total	3.1	0.10	3.000	0	104	81.6	129			
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Sample ID **MB-40955** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **40955** RunNo: **54829**

Prep Date: **10/11/2018** Analysis Date: **10/12/2018** SeqNo: **1823415** 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	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 Quanitative 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

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: HILCORP ENERGY Work Order Number: 1810653 RcptNo: 1

Received By: Anne Thorne 10/11/2018 7:00:00 AM Anne Thorne

Completed By: Anne Thorne 10/11/2018 7:58:50 AM Anne Thorne

Reviewed By: ENM 10/11/18

Labeled by: JAB 10/11/18

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? (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: JAB 10/11/18

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	1.4	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp Energy L48 West
Jennifer Deal

Mailing Address:

Phone #: 505-324-5128

email or Fax#: jdeal@hilcorp.com

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

Accreditation
☒ NELAP ☐ Other

☒ EDD (Type) PDF

Turn-Around Time:
☒ Standard ☐ Rush

Project Name:
Standard #1

Project #:
017817006

Project Manager:
Danny Burns

Sampler: Josh Adams

On Ice: ☒ Yes ☐ No

Sample Temperature: 2.4-CF-1.0=1.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	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)
10-10-18						1810653																	
10-10-18	0900	S	MW8@30-32'	(1) 4oz	cool	201	X		X														
	0905		MW8@34-35'			202	X		X														
	1215		MW13@6-8'			203	X		X														
	1220		MW13@34-35'			204	X		X														
	1630		MW14@24-26'			205	X		X														
↓	1645	↓	MW14@32-34	↓	↓	206	X		X														

Date:	Time:	Relinquished by:	Received by:	Date	Time
10-10-18	1718	Josh Adams	Christa Waltz	10/10/18	1718
10/10/18	1842	Christa Waltz		10/11/18	0706

Remarks: cc: dburns@eltenv.com
aager@eltenv.com

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.