<u>vistrict 1</u> ,25 N. French Dr., Hobbs, NM 88240 <u>vistrict II</u> 811 S. First St., Artesia, NM 88210 <u>District III</u> 1000 Rio Brazos Road, Aztec, NM 87410 <u>District IV</u> 1220 S. St. Francis Dr., Santa Fe, NM 87505 State of New Mexico Energy Minerals and Natural Resources Department

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Form C-141 Revised August 24, 2018 Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible	Party Hilco	orp Energy Compa	any		OGRID 372171				
Contact Nan	ne Jennifer	Deal			Contact Telephone 505-801-6517				
Contact ema	il jdeal@hi	lcorp.com	36050597						
Contact mai	ling address	382 Road 3100,	Aztec NM 8741	0					
						NWUCD			
			Locatio	n of Re	lease Source	DEC 2 4 2018			
Latitude 36	.88592353_		(NAD 83 in)	L decimal degr	ongitude -107.8994293	DISTRICT III			
Site Name I	Lambe 2C			1	Site Type Gas Well				
Date Release	Discovered	12/17/18 @ 10:	30am		API# 30-045-30747				
Unit Letter	Section	Township	Range		County				
Н	20	31N	10W	San Ju	Jan				

Nature and Volume of Release

Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	Yes No
🛛 Condensate	Volume Released (bbls) 97	Volume Recovered (bbls) 0
by OCD: 8/30/2019 1:47:	15 bM ume Released (Mcf)	Volume Recovered (Mcf)
Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A release of ~97bbls of oil/condensate was released due to corrosion on the tank. MSO arrived on location and noticed oil ir oil tank containment. MSO inspected tank and found corrosion on the bottom of the tank and a hole where the oil was leal was shut in and tank was taken out of service. Release remained inside the berm.

Michelle Lujan Grisham Governor

Sarah Cottrell Propst Cabinet Secretary

Todd E. Leahy, JD, PhD Deputy Secretary

September 9, 2019

Jennifer Deal Hilcorp Energy Company 382 Road 3100 Aztec, New Mexico 87401 jdeal@hilcorp.com

RE: Lambe 2C (30-045-30747) Site Characterization and Remediation plan

Ms. Deal,

The New Mexico Oil Conservation Division (OCD) has received the site characterization and remediation plan for the Lambe 2C on August 30, 2019 for the Lambe 2C release and has approved the plan with the following conditions of approval:

- HEC will start SVE remediation no later than October 1, 2019
- HEC will achieve a run time of 90% or better of the proposed 8 hours per event.
- HEC will collect an initial gas sample for laboratory analysis shortly after startup of SVE operations after the initial gas sample an annual sample is required. The air sample must be collected prior to the inlet of the vacuum pump but, after the convergence of all SVE wells or alternativity an air sample from each SVE well is acceptable.
 - The gas sample will be analyzed for EPA Method 8260 Full List and include Carbon Dioxide and Oxygen.
- HEC quarterly report (If needed) will include at a minimum
 - o Summary of remediation activity for the quarter
 - SVE Run time
 - o SVE mass removal
 - Field notes (VOC readings, water/product recovery, inspection dates etc)
 - Amount of liquids/product recovered if any (This will be recorded from the knock out drum since ground water in not expected to be encountered)
- HEC will submit a detailed closure plan via email for OCD approval prior to the collection of any confirmation Borehole samples. The Closure plan will include at a minimum bore hole locations, sampling method and frequency.

OCD's approval of the characterization and remediation plan does not relieve Hilcorp of any other requirements imposed by any other regulatory agencies.

Respectfully,

Cory Smith Environmental Specalist

Adrienne Sandoval, Division Director Oil Conservation Division



or/n C-141	State of New Mexico	Incident ID
age 2	Oil Conservation Division	District RP
		Facility ID
		Application ID
Was this a major release as defined by 19.15.29.7(A) NMAC?	If YES, for what reason(s) does the responsible part This is a major release as the amount is >25bbls	y consider this a major release?
If YES, was immediate n Immediate notification w with NMOCD, and Whit	totice given to the OCD? By whom? To whom? Who ras given by Jennifer Deal by email on 12/17/2018 @ ney Thomas and Emmanuel with BLM.	en and by what means (phone, email, etc)? 1:02pm to Cory Smith, Vanessa Fields, and Jim Griswold
	Initial Response	e
The responsible	party must undertake the following actions immediately unless they	could create a safety hazard that would result in injury
The source of the relation	ease has been stopped.	
The impacted area ha	as been secured to protect human health and the enviro	onment.
Released materials h	ave been contained via the use of berms or dikes, abso	rbent pads, or other containment devices.
All free liquids and r	ecoverable materials have been removed and managed	appropriately.
If all the actions describe	d above have not been undertaken, explain why:	

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name:Jennifer Deal Signature:Quantifier Deal	Title: Environmental Specialist Date: 12/21/2018
email:jdeal@hilcorp.com	Telephone:505-801-6517
OCD Only Received by: Jonessa Fields	Date: 1212412018

Form C-141 Page 3 State of New Mexico Oil Conservation Division

Incident ID	NVF1836050592
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

	50-100
What is the shallowest depth to groundwater beneath the area affected by the release?	$\underline{-50-100}$ (ft bgs)
Did this release impact groundwater or surface water?	Yes 🗶 No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	🗶 Yes 🗌 No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	🗌 Yes 🗶 No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	🗌 Yes 🗶 No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	🗌 Yes 🗶 No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	🗌 Yes 🗶 No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	🗌 Yes 🗶 No
Are the lateral extents of the release within 300 feet of a wetland?	Yes 🛛 No
Are the lateral extents of the release overlying a subsurface mine?	🗌 Yes 🗶 No
Are the lateral extents of the release overlying an unstable area such as karst geology?	🗌 Yes 🗶 No
Are the lateral extents of the release within a 100-year floodplain?	🗌 Yes 🗶 No
Did the release impact areas not on an exploration, development, production, or storage site?	🗌 Yes 🗶 No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: Each of the following items must be included in the report.

- Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- 🛛 Field data
- X
 Data table of soil contaminant concentration data
- X Depth to water determination
- X Determination of water sources and significant watercourses within ¹/₂-mile of the lateral extents of the release
- **X** Boring or excavation logs
- X Photographs including date and GIS information
- X Topographic/Aerial maps
- **X** Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141 State of New Mexic				Incident ID	1
Page 4	Oil Conservation Division	Oil Conservation Division			
				Facility ID	
				Application ID	
I hereby certify t regulations all op public health or failed to adequat addition, OCD a and/or regulation Printed Name: Signature: email: jdeal	hat the information given above is true and complete to the berators are required to report and/or file certain release noti the environment. The acceptance of a C-141 report by the C ely investigate and remediate contamination that pose a three cceptance of a C-141 report does not relieve the operator of is. Jennifer Deal Group Com	best of m fications DCD does at to grou responsit _ Title: _ Date: _ Teleph	y knowledge ar and perform co not relieve the undwater, surfac bility for compli Environn 8/30/19 505- one:	nd understand that pursu rrective actions for rele operator of liability sho ce water, human health fance with any other fec nental Specialist 801-6517	Lant to OCD rules and ases which may endanger build their operations have or the environment. In deral, state, or local laws
OCD Only					
Received by: _			Date:		

Form C-141 Page 5 State of New Mexico Oil Conservation Division

Remediation Plan Checklist: Each of the following items must be included in the plan.

X Detailed description of proposed remediation technique

Incident ID	
District RP	
Facility ID	
Application ID	

Remediation Plan

X Scaled sitemap with GPS coordinates showing delineation points **x** Estimated volume of material to be remediated **X** Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC **K** Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required) Deferral Requests Only: Each of the following items must be confirmed as part of any request for deferral of remediation. Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction. Extents of contamination must be fully delineated. Contamination does not cause an imminent risk to human health, the environment, or groundwater. I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. Printed Name: Jennifer Deal Title: Environmental Specialist Signature: _____ Jernife Deel _____ Date: 8/30/19 email: __jdeal@hilcorp.com 505-801-6517 Telephone: OCD Only Received by: OCD 8/30/19 Date: Approved with Attached Conditions of Approval Approved Denied Deferral Approved any his 9/9/19 Date: Signature:



LT Environmental, Inc.

848 East Second Avenue Durango, Colorado 81301 970.385.1096

August 30, 2019

Mr. Cory Smith New Mexico Oil Conservation Division 1000 Rio Brazos Road Aztec, New Mexico 87410

RE: Soil Delineation and Proposed Remediation Workplan Hilcorp Energy Company Lambe 2C API # 30-045-30747 Incident # NVF1836050592 San Juan County, New Mexico

Dear Mr. Smith:

LT Environmental, Inc. (LTE), on behalf of Hilcorp Energy Company (Hilcorp), presents the following summary report and remediation workplan discussing delineation soil sampling, monitoring well installation, and groundwater sampling activities conducted at the Lambe 2C natural gas production well (Site). The Site is on a mesa between Arch Rock Canyon and Hart Canyon, south of Cedar Hill, New Mexico, in Unit H of Section 20 of Township 31 North and Range 10 West in San Juan County (Figure 1). The purpose of the investigation was to evaluate potential hydrocarbon impacts in the subsurface following the discovery of a condensate release.

Background

On December 17, 2018, Hilcorp personnel discovered a pinhole leak due to corrosion in the bottom of a condensate tank. The leak resulted in approximately 97 barrels (bbls) of condensate draining onto the ground and infiltrating the subsurface. The release was contained within the earthen berm, but no liquids were recovered. The defective tank was immediately shut-in, drained of remaining liquids, and taken out of service. 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 24, 2018.

The nearest permitted water well (SJ-01198) is approximately 0.7 miles to the northwest. The permitted water well is used for one household domestic purposes and total depth is listed at 158 feet below ground surface (bgs). Depth to water in the water well is listed as 97 feet bgs. During excavation activities conducted during release response, water was encountered in the base of the excavation at 29 feet bgs. Additional investigation through groundwater monitoring wells did not identify groundwater and LTE estimates groundwater to be between 51 and 100 feet bgs based on nearby topographic features. Arch Rock Canyon is approximately 138 feet





lower in elevation than the Site, but Hart Canyon, to the south, is 91 feet lower in elevation. The nearest surface water feature is an unnamed, fourth-order tributary of the Animas River and 150 feet to the northwest. There is no lakebed, sinkhole, playa lake, wetland, mine, residence or other building nearby. The Site is not in an unstable area or the 100-year floodplain. Due to the proximity of the significant watercourse, the remediation action levels applied to the Site are 100 milligrams per kilogram (mg/kg) total petroleum hydrocarbons (TPH), 10 mg/kg benzene, 50 mg/kg total for the sum of benzene, toluene, ethylbenzene, and total xylenes (BTEX), and 600 mg/kg chloride.

Release Response

Hilcorp responded to the release by conducting a preliminary delineation investigation to determine the extent of subsurface hydrocarbon impact. In January of 2019, soil samples were collected from soil borings via hand auger and a hollow-stem auger CME55 drill rig. Borings were advanced until refusal in cobbles at depths ranging from 9 feet to 12 feet bgs.

Upon encountering refusal with the hollow-stem drill rig due to cobbles at a relatively shallow depth, Hilcorp initiated remediation activities via excavation. Between January and May 2019, an estimated total of 5,000 cubic yards of impacted soil was excavated and hauled for disposal. The extent of the excavation is depicted in Figure 2 and pictures are included in a photo log in Attachment 1. The excavation depth ranged from 23 feet to 29 feet bgs, which required significant sloping of the sidewalls. The footprint of the excavation is included in Figure 2, and the actual excavation to full depth is differentiated from the footprint to better represent actual conditions. During excavation activities, potential groundwater was encountered at the base of the excavation at 29 feet bgs on May 3, 2019.

Based on the size of the excavation and the presence of water, a second attempt at subsurface delineation was conducted with a sonic drill rig on July 22, 2019. On June 22 through June 24, 2019, LTE used a sonic drill rig to advance boreholes (MW01 through MW08) to collect soil samples for laboratory analysis and determine the lateral and vertical impacts outside of the existing excavation extent. In anticipation of encountering groundwater, monitoring wells were permitted with the New Mexico Office of the State Engineer (NMOSE) and were installed following soil boring activities.

Subsurface Investigations

LTE conducted soil sampling during all phases of the release response. The following section provides a chronology of site work and describes methods used for sampling.





Hand Auger Investigation

LTE personnel collected soil samples via hand auger on January 4, 2019, to characterize soil impacts immediately within the bermed area. A hand auger was used to complete a borehole to a depth of 11.5 feet bgs within the bermed area containing the faulty condensate tank and a below grade tank. The borehole was advanced until refusal immediately next to the below grade tank and is identified as HA-1 on Figure 2.

Continuous soil samples were logged by an LTE geologist and described using the Unified Soil Classification System (USCS). Soil samples were field screened with a photo-ionization detector (PID) at one-foot intervals until refusal was encountered with the hand auger at just below 11 feet bgs. Two soil samples were collected from the hand auger borehole; one at the highest observed PID reading and one at the terminus of the boring. A soil boring log is included as Attachment 2.

Soil samples were labeled with the date and time of collection, sample name, sampler's name, and parameters to be analyzed. 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. 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. Samples were analyzed for 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 EPA Method 8015. Due to the condensate source, chloride was not analyzed.

Hollow-Stem Auger Investigation

Since hand augering was insufficient for penetrating the subsurface deeper than 11 feet bgs, four boreholes (BH-1 to BH-4) were advanced via hollow-stem auger outside of the bermed area in each cardinal direction from the known impacted area on January 4, 2019. Boreholes were advanced to 9 feet to 12 feet bgs before refusal was encountered at what was determined to be a cobble layer. Soil in the boreholes was described and field screened. No impacts were observed via field screening and no soil samples were collected from the hollow-stem boreholes. Soil boring logs are included as Attachment 2.

Excavation

While vertical delineation was not obtained during the previous investigations, the borings suggested lateral impact was restricted to the bermed area, so Hilcorp initiated excavation. Approximately 5,000 cubic yards of soil were removed between January and May of 2019. During





excavation activities, potential groundwater was encountered at the base of the excavation on May 3, 2019.

LTE personnel sampled the groundwater (GW01) and collected two grab samples (GR01 and GR02) from the sidewalls of the existing open excavation for characterization of the remaining impacts. LTE recommended additional excavation and investigation by trenching laterally outward in three directions. On May 29, 2019, discrete grab samples were collected from the investigation trenches (GR03, GR04, GR05), excavation soil samples (GR06, GR07, GR08, GR09, and GR10) were collected from the sidewalls, and a 5-point composite soil sample was collected from the floor of the excavation (FS01). All samples were handled as previously described. Soil samples were analyzed for BTEX and TPH. The groundwater sample was analyzed for BTEX by EPA Method 8260B. Based on results from the soil sampling that indicated a significant amount of clean overburden would be required to be removed before reaching impacted soil at depth, excavation activities were suspended, and additional subsurface delineation was scheduled following backfilling activities.

Sonic Drilling Investigation

A second attempt at subsurface delineation was conducted with a sonic drill rig on July 22, 2019. In anticipation of encountering groundwater, monitoring wells were permitted with the New Mexico Office of the State Engineer (NMOSE) and were installed following soil boring activities. On June 22 through June 24, 2019, LTE used a sonic drill rig to advance boreholes (MW01 through MW08) to collect soil samples for laboratory analysis and determine the lateral and vertical impacts outside of the existing excavation extent. Soil samples were collected in a continuous soil sampler by an LTE geologist, described, and field screened with a PID at six-inch to one-foot intervals based on sample recovery. Samples were collected and submitted for laboratory analysis at the depths where elevated field screening results were observed and at the bottom of the boring. The borings and monitoring well locations are identified in Figure 3. Soil boring logs are included as Attachment 1. Samples were analyzed for BTEX and TPH by methods previously listed.

The monitoring wells were constructed with 2-inch inside diameter (ID) schedule 40 polyvinyl chloride (PVC) casing and screen. The screen was factory-slotted with a slot size of 0.010 inches. The screened interval for each monitoring well was 15 feet in length. A 10-20 size silica sand pack was used to fill the annular space from the bottom of the screen to approximately 2 feet above the top of screen. The sand pack was overlain by hydrated bentonite chips to the ground surface. The monitoring wells were completed as stick-ups with approximately 3 feet of PVC riser extending above the excavation floor.





Results

The geology at the Site consists of dark reddish-brown, dry, silty sand to approximately 14 feet bgs, followed by a loose, dry, sand and gravel with cobbles greater than eight inches in diameter to approximately 25 feet bgs. From approximately 25 feet to 35 feet bgs, a dense, light brown, slightly moist, sandy silt was encountered. Moist sediments were encountered near 30 feet bgs, but no saturated sediments were observed and no clear water table was identified in the soil borings. LTE set the groundwater monitoring wells with screened intervals corresponding to the moist intervals and the depth of the excavation where potential groundwater was previously observed.

Field-identified soil impacts consisting of visual staining, hydrocarbon odors, and/or elevated field screening results were observed in the hand auger borehole HA-1 (9 to 11.5 ft bgs), excavation grab samples (GR01 @ 28', GR04 @ 28', GR05 @ 28', and GR06 @ 28'), and in monitoring well borehole sample MW01 @ 25'-30'. The TPH concentrations exceeding the NMOCD remediation action level ranged from 180 mg/kg in monitoring well borehole MW01 @ 25'-30' to 11,100 mg/kg in hand auger borehole HA-1 @ 11'. A benzene concentration of 20 mg/kg was detected in hand auger borehole HA-1 @ 11'. Total BTEX concentrations exceeding the NMOCD remediation action level ranged from 276 mg/kg in excavation grab sample GR06 @ 28' to 1,061 mg/kg in hand auger borehole HA-1 @ 11'.

All other soil samples were compliant with NMOCD remediation action levels for benzene, BTEX, and TPH, or were below laboratory detection limits for the listed parameters. The soil analytical results as compared to the NMOCD remediation action levels are presented in Table 1. The laboratory analytical reports are included as Attachment 3.

The grab sample of the groundwater accumulating in a trench at the lowest point of the excavation extent near 29 feet bgs exceeded the New Mexico Water Quality Control Commission (NMWQCC) standard for benzene, toluene, and total xylenes. Results are presented in Table 2 and the laboratory analytical report is in Attachment 3.

Monitoring Well Groundwater Gauging

Following installation, LTE personnel were onsite to gauge groundwater levels and develop the monitoring wells on June 26, 2019. During this event, groundwater was not observed in any of the wells. On August 1, 2019, LTE return to the Site to determine if groundwater had infiltrated the monitoring wells with enough of a volume to develop or collect groundwater samples. Again, no groundwater was observed in any of the monitoring wells.





Conclusions

Based on the excavation characterization soil samples and monitoring well borehole soil samples, impacts to soil have been laterally and vertically defined at the Site. Excluding the already excavated impacted material, an estimated 600 cubic yards of impacted soil remain in place. Impacts appears to be confined to the dense, sandy silt beneath the cobble matrix, from approximately 25 feet to 30 feet bgs. Soil sample results exceeding NMOCD remediation action levels were limited to hand auger borehole HA-1, excavation grab samples GR01 @ 28', GR04 @ 28', GR05 @ 28', GR06 @ 28', and monitoring well borehole MW01 @ 25'-30'. All remaining soils samples are in compliant with NMOCD remediation action levels. The extent of the remaining impacted soil is identified on Figure 3.

Impacts to groundwater were not observed beyond the initial water sample collected in the base of the excavation which exceeds NMWQCC standards. No groundwater has been observed in any of the monitoring wells since installation. Based on the lack of groundwater in the monitoring wells, it is anticipated that the observed water in the excavation was a result of precipitation infiltrating over time into the open excavation and adsorbing into the finer grained, confining sandy silt lithology. At this time, LTE has estimated groundwater at the Site to be between 50 and 100 feet bgs based on nearby topographic features.

RECOMMENDATIONS

Based on the limited area of impact that exceeds the NMOCD remediation action level and the existing locations of the de facto soil vapor extraction wells, LTE recommends a multi-tiered, insitu, intermittent SVE remediation approach. Due to the lack of observed groundwater in the monitoring wells, LTE proposes using the existing wells as soil vapor extraction (SVE) wells. The wells were completed with 2-inch diameter schedule 40 polyvinyl chloride (PVC) casing with 0.010" slotted screened intervals placed in the zone where field identified impacts were observed.

LTE proposes utilizing a portable air compressor and installing Venturi-style "T" fittings on the SVE wells. The Venturi T contains a nozzle that increases air velocity through the fitting. When air flow is applied, the air velocity increases which creates a pressure differential that induces vacuum and air flow from the SVE well. The resulting vacuum draws hydrocarbon impacts from the subsurface towards the SVE well. The exhaust of the SVE well is piped into a 55-gallon drum which acts as a knockout tank to capture and contain any fluids recovered while SVE operations are conducted. Induced vacuum gauge, volumetric air flow, and PID field screening will be recorded during each event.

During the first SVE event, LTE proposes using the Venturi T on monitoring wells MW02, MW03, MM05, MW06, and MW07 to observe if any soil vapor is recovered from these wells and determine if additional soil vapor recovery locations are viable. While these monitoring wells did





not exhibit any soil impacts during installation, there is potential to recover soil vapor and remediate existing impacts within the radius of influence of the induced vacuum from the Venturi T.

Subsequent to the first testing event, LTE recommends conducting dual SVE/bioventing events with the portable air compressor every week for four weeks. During each event, the air compressor will be used for eight consecutive hours to induce vacuum via the Venturi T on all wells that demonstrated recoverable vapor. Wells that are not being pulled on or did not recovery vapors during the initial event will be used as biovent wells. Ambient air from the portable air compressor will be directed via a manifold into the biovent wells to introduce supplemental oxygen into the subsurface to promote biological activity and the biodegradation of recalcitrant hydrocarbon impacts. Indigenous aerobic bacterial activity is enhanced with the addition of oxygen and encourages the biodegradation of excess organic material, such as hydrocarbons, in an in-situ remediation method known as bioventing. Additionally, the bioventing wells will facilitate ambient air advection and optimize the SVE progress.

An air sample will be collected and submitted for laboratory analysis during the first and fourth SVE/bioventing event to determine the effective reduction and remediation of impacts. Once laboratory analytical results are received, LTE will propose additional SVE events or conduct confirmation closure sampling. If remediation progress and effectiveness are not observed within the first four events, LTE will propose alternative means of achieving cleanup at that time. However, SVE is a tested remediation technology and is well suited for this site-specific application.

If a significant decline in air sample laboratory analytical results is observed, indicating sufficient mass source removal, confirmation soil samples will be collected via hollow-stem auger in the areas where previous soil samples were collected that exceeded NMOCD remediation action levels. Soil samples will be submitted for laboratory analysis of BTEX and TPH. If laboratory analytical results indicate that confirmation soil sample TPH, benzene, and BTEX concentrations are compliant with NMOCD remediation action levels, Hilcorp will request that this Site be granted a No Further Action status. A letter report detailing closure sampling will be submitted under separate cover. Existing AS/SVE wells will be plugged with hydrated bentonite and abandoned in place following status approval.

During each of the SVE events, LTE will continue gauging the monitoring wells to determine if groundwater has infiltrated the wells. If groundwater is encountered in the monitoring wells, a grab sample will be collected and submitted for analysis of volatile organic compounds (full list VOCs) by EPA Method 8260, total dissolved solids, pH, and cations and anions by EPA Method 300.0.





Smith, C. Page 8

SCHEDULE

Hilcorp will initiate the first remediation event within 3 weeks of approval of this remediation work plan.

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

Sincerely,

LT ENVIRONMENTAL, INC.

Danny Burns Project Geologist

Ashley L. Ager

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

cc: Jennifer Deal, Hilcorp Energy Company

Attachments:

Figure 1 – Site Location Map Figure 2 – Initial Site Investigation Map Figure 3 – Monitoring Well Borehole Map Table 1 – Soil Analytical Results Table 2 – Water Analytical Results Attachment 1 – Photo Log Attachment 2 - Soil Boring Logs Attachment 3 – Laboratory Analytical Reports



FIGURES





P:\Hilcorp\GIS\MXD\017818055_LAMBE 2C\017818055_FIG01_SL_2019.mxd



P:\Hilcorp\GIS\MXD\017818055_LAMBE 2C\017818055_FIG02_SITE_050619.mxd



P:\Hilcorp\GIS\MXD\017818055_LAMBE 2C\017818055_FIG03_MW_RESULTS.mxd

TABLES



TABLE 1SOIL ANALYTICAL RESULTS

LAMBE 2C SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl- benzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
Initial Hand Auger Inv	estigation Samp	oles									
HA-1 @ 9'	1/4/2019	2,639	2.2	57	19	210.0	288.2	3,200	1,000	<490	4,200
HA-1 @ 11'	1/4/2019	1,760	20	270	61	710.0	1,061	7,300	3,800	<470	11,100
Open Excavation Grab/Characterization Samples											
GR01 @ 28'	5/3/2019	3,512	<0.38	0.89	0.81	11.0	12.70	200	330	<46	530
GR02 @ 29'	5/3/2019	98.1	<0.023	<0.045	<0.045	<0.090	<0.090	<4.5	<9.9	<50	<50
GR03 @ 28'	5/29/2019	3.2	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.1	<46	<46
GR04 @ 28'	5/29/2019	4,852	0.045	2.5	2.5	37.0	42.05	550	1,000	<480	1,550
GR05 @ 28'	5/29/2019	2,460	<0.024	<0.048	<0.048	1.4	1.40	50	420	<46	470
GR06 @ 28'	5/29/2019	7,348	<0.49	35	21	220.0	276	2,600	2,200	<490	4,800
GR07 @ 23'	5/29/2019	3.8	<0.024	<0.048	<0.048	<0.097	<0.097	<4.8	<9.6	<48	<48
GR08 @ 25'	5/29/2019	3.1	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.9	<49	<49
GR09 @ 25'	5/29/2019	3.1	<0.023	<0.047	<0.047	<0.093	<0.093	<4.7	<9.3	<47	<47
GR10 @ 23'	5/29/2019	2.4	<0.023	<0.046	<0.046	<0.093	<0.093	<4.6	<9.2	<46	<46
FS01 @ 29'	5/29/2019	3.5	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<10	<50	<50
Monitoring Well Insta	llation/Soil Bori	ing Samples									
MW01 @ 25' - 30'	7/24/2019	>5,000	<0.12	0.36	0.56	6.2	7.1	120	60	<50	180
MW01 @ 30' - 35'	7/24/2019	18.6	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.5	<48	<48
MW02 @ 20' - 25'	7/23/2019	3.5	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.5	<48	<48
MW02 @ 30' - 35'	7/23/2019	1.1	<0.025	<0.049	<0.049	<0.098	<0.098	<4.9	<9.6	<48	<48
MW03 @ 20' -25'	7/23/2019	7.5	<0.025	<0.025	<0.050	<0.10	<0.10	<5.0	<9.4	<47	<47
MW03 @ 30' - 35'	7/23/2019	5.3	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<10	<51	<51
MW04 @ 20' - 25'	7/24/2019	7	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<10	<52	<52
MW04 @ 30' - 35'	7/24/2019	2.2	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.8	<49	<49
MW05 @ 15' - 20'	7/24/2019	19.9	<0.024	<0.024	<0.049	<0.049	<0.098	<4.9	<10	<51	<51
MW05 @ 30' - 35'	7/24/2019	7.2	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<10	<52	<52



TABLE 1SOIL ANALYTICAL RESULTS

LAMBE 2C SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl- benzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
MW06 @ 20' - 25'	7/22/2019	20	<0.025	<0.049	<0.049	<0.098	<0.098	<4.9	<10	<50	<50
MW06 @ 30' - 35'	7/22/2019	0.0	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<10	<50	<50
MW07 @ 25' - 30'	7/23/2019	>5,000	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<10	<52	<52
MW07 @ 30' - 35'	7/23/2019	42.3	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.9	<49	<49
MW08 @ 0' - 5'	7/22/2019	11.8	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<9.4	<47	<47
MW08 @ 30' - 35'	7/22/2019	3.0	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<9.3	<47	<47
NMOCD Reme	diation Action L	evel	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

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 WATER ANALYTICAL RESULTS

LAMBE 2C SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Sample Identification	Sample Date	Benzene Toluene (mg/L) (mg/L)		Ethylbenzene (mg/L)	Total Xylenes (mg/L)	
GW01	05/03/2019	2.3	4.5	0.210	2.6	
NMWQCC Standard		0.01	0.750	0.750	0.620	

NOTES: mg/L - milligrams per liter

NMWQCC - New Mexico Water Quality Control Commission

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

Bold - indicates value exceeds stated NMWQCC standard



ATTACHMENT 1: PHOTO LOG











Elevation: Gravel Pack: Casing Type:	Der	tector:	PID			BORIN Boring/Well Date: 1 - Logged By: Drilling Me Seal:	Advancing Of 848 E. 2nd J Durango, C SG LOG/MONITORIN HA - 1 4 - 2019 Josh Adams thod: Hand Mug Hollow Stem	Deportunity Ave Colorado 81301 G WELL COMPLETIC Project: Lamb Project Number: OI781 Drilled By: Geor Continuous& Grout: Hole Diameter:	ON DIAGRAM e 2C 8055 nat Split Span
Screen Type:		Slot:				Diameter:	2" Length:	Total Depth:	Depth to Water:
Penetration Resistance	Moistured Moistu	C C C C R HC Staining?	Depth (ft. bgs.) 0 1 2 3 4 5 6 7 8	Sample Run	MUMMIN Recovery	7 7 Soil/Rock Type	2" Hand Auger in <u>1</u> <u>4-4.5' perco</u> <u>7.5 YR 4/6 dar</u> <u>5.11, cohes, ue</u> <u>Strong HC</u> <u>30</u>	K brown sandy plastic, nostein	Well Completion
2639 2631 1760	M M M		6 9 10 11 12 13 14 15			CL	7.5YR 4/6 dark DR - Verly cohesive, pl Strong HE odor SAA w/ Jome ge Nefusal C 11.5	ion sandy leanchu lastic, no stain ravel intermited	

1

Elevation: Gravel Pack: Casing Type: Screen Type:		Detector:	Slot:	PID			BORIN Boring/Wel Date: Logged By: Drilling Met Seal: Diameter:	Advancing Oppo 848 E. 2nd Ave Durango, Colo G LOG/MONITORING V Mumber: 3 - 2 019 Josh Adams thod: Hollow Stem Length: 2" Length:	rtunity rado 81301 VELL COMPLETIC Project: Lamb Project Number: OI78 \805 Drilled By: Geor Sampling Method: Continuous/S Grout: Hole Diameter: Total Depth:	ON DIAGRAM e 2C 5 nat Split Spoon Depth to Liquid: Depth to Water:
Penetration Resistance Moisture	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	2" Lithology/Re	marks	Well Completion
	× 0,4 0,4 0,8 1.1 0,8 1.0			0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	0-5 0-5 5-9 5-9 9-10	MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM	mL mL mL SP SP	NR Ightbrown/brown Silt 2.5YR 4/9 CC OCDT chronic SAA SAA w/treason white/pink internixed internixed internixed internixed internixed internixed internixed internixed SAA SAA SAA SAA Samp Scoold Speand Speand SAA Speand SAA Speand Speand SAA Speand Speand SAA Speand Speand SAA Speand Speand SAA Speand	- sandy , no sheen is plastic - brown - clays (1028/4) - the stain - claycantent led u/ split ue to increase - ticn ites istan	

Geogle Earth/ Elevation: Gravel Pac	k:		Detector:	BH:	PID			BORIN Boring/Well Date: Logged By: Drilling Met Seal:	Advancing Oppo 848 E. 2nd Ave Durango, Colo G LOG/MONITORING V BH - 2 -3 - 2019 Josh Adams hod: Hollow Stem	rtunity prado 81301 VELL COMPLETIC Project: Lamber Project Number: OI7818 Drilled By: Geom Sampling Method: Continuous/S Grout:	DN DIAGRAM 2C 055 nat plit Spoon
Casing Typ	be:			G1 /				Diameter:	Length:	Hole Diameter:	Depth to Liquid:
Screen Typ	be:		~	Slot:				Diameter:	Length:	Total Depth: 10	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining,	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Re	emarks	Well Completion
	M	0.4	N		0	0-5	mar	ML	7.5YR 5/8 Brown S cohesive, slightly pill or ode r	illty Sand astic, no Stair	
	M	0:1	Ν		3 4 -	05	Control of	mL	SAA		T + + + +
			\times		6 7 8	5-9'	X		remove con NR Sampled 9-10' u	intered ~ C' tinous 3 ampler u/split spoon	
					9	7-101	MO	SP.	Va comple of	obble	Ŧ
					10 11 12 13 14 15	-	2		refusal 2 10 cobble		

R,

Elevation: Gravel Pac Casing Typ	k: pe:		Detector:	EA. E-BH	PID			BORIN Boring/Wel Date: Logged By: Drilling Me Seal: Diameter:	Advancing O 848 E. 2nd Durango, O GLOG/MONITORIN Number: BH-3 -3-2019 Josh Adams thod: Hollow Stem	Pportunity Ave Colorado 81301 NG WELL COMPLE Project: Lan Project Number: OIP Drilled By: Ge Sampling Method: Continuou Grout: Hole Diameter:	rion diagram nbe 2C 818005 eomat Is/Split Spoon
Screen Typ	ie:			Slot:				Diameter:	Length: 2''	Total Deput	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litholog	y/Remarks	Well Completion
					0	0-5	\rangle	INR	7.5YR 5/8 Brow colresile, Sligh	n, sahdy silt, ty plastic, no	
	M	0.2	\sim		2 3	6-5	Mary	mL	J	λĭΛ	
	M	03	N		4 _	0-5	3	mL,	SAA		÷
	M	63	N		6	5-75	NAN P	ML	SAA	- 1	+
	P	0.1	2		0	575	5	SP	brown poorly gre	del Sud v/grav	211
					9	-			Cabbles end sampler, N	R	+
					10 11 12 13 14 15				refusal C	9.5 cobbles	



eoge Earth Elevation: Gravel Pack Casing Typ	k: e:		BHA BHA Detector:	BH-1 BH 2	PID			BORIN Boring/Wel Date: Logged By: Drilling Me Seal: Diameter:	B48 E. 2nd Ave Durango, Color IG LOG/MONITORING W Number: BH-4 - 3 - 2019 Josh Adams thod: Hollow Stem	rado 81301 ELL COMPLETIO Project: Lambe Project Number: O 17818000 Drilled By: Geom Sampling Method: Continuous/S Grout: Hole Diameter:	N DIAGRAM 2C at blit Spoon Depth to Liquid:
Screen Typ	e.		~	5101.			_	Diameter.	2"	10121 Depuit. 9.0'	Depui to Water.
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rer	narks	Well Completion
					0	0-5	X	NR	OYR 3/6 darkbraun	sandy silt -	
					1		N		Stain)	NO GROU OF	
	M	0.6	N		2	05	222	mL		-	-
	M	0.4	N		4	0.5	m	mL	SAA	-	-
					6	5-8	X		NR		-
		0.4			7 _	5-8	MN	CH	\$ 10 YR 3/10 dark 1 four clay some g of sampler	brown sandy ravel e loothom	-
					9	-			cobbles/gravel er ~ 8'bgs, remov	r sample	-
					10					· · ·	-
					11 12	-			refusal @ 9' a	-bbles	-
					13					-	-
					14					-	-
					15	-					-

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							C N	L	Advancing Oppor 848 E. 2nd Ave Durango, Color	tunity rado 81301	
	1	C	Ty as			tan a f		BORIN	G LOG/MONITORING W	ELL COMPLETI	ON DIAGRAM
	1514							Boring/Wel	Number:	Project:	e 2C
	19 10 10 10 10 10 10 10 10 10 10 10 10 10							Date:	7/011/0	Project Number:	
		and the second				and a	-	Logged By:	//24/14	0178/801	55
Elevation			Detector			AL COMPANY	Sala V	Deilling Ma	E. Carron	Cascade	:
			Concentration		PID			Drilling Me	Sonic	Sampling Method:	r
Gravel Pac 10-2	^{k:} 0 Silica	Sand						Seal:	Bentonite	Grout: Blatoni	1.0
Casing Typ	e: dule 40	PVC						Diameter:	Length:	Hole Diameter: //	Depth to Liquid:
Screen Typ	e:	1.40		Slot:				Diameter:	Length:	Total Depth: 2 C I	Depth to Water:
Sche	dule 40	PVC	5	0.0	10"		_		2" 15	35	29'
Penetration Resistance	Moisture Content	Vapor (ppm	HC Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rer	narks	Well Completion
	DN	0,0	N0		0	1		SP-GM	med dose, rel brown	Silby Sand	1
					1	-			Ezcavation backfi	" to ~ 20'	$ \mathbf{x}_{\mathbf{x}} \mathbf{x}_{\mathbf{x}} $
						-			Ê		$[\mathbf{x}_{1}] \times [\mathbf{x}_{2}]$
					2 -						+ 1 1 1
					3 _						$\downarrow \rangle \times \rangle \times $
					4	-					$\begin{bmatrix} \mathbf{r} \\ \mathbf{x} \end{bmatrix} \begin{bmatrix} \mathbf{r} \\ \mathbf{x} \end{bmatrix}$
<u> </u>	moist	1.6	NO		5	-					$[x^{"}]$
					,	1					+_× ×
					6	-				а	$\Gamma \times ^{\times} \times $
					7	-					XX X
						-					$[\mathbf{x}]$
					°						+ `` ` X
					9						
	moist	4.2	ND		10						+_* X
					11	-					$\mathbb{T}_{X} \mathbb{Y}_{Y} $
											$[\mathbf{P}_{\mathbf{v}} \mathbf{v}_{\mathbf{v}}]$
					12 -	-					
					13					á .	
					14	·			XV		4 8
	ha a`()	12			16] [X	Y		T Y [~
	MOIST	6.1	IVP		15			\sim			X IX

	-		2						Boring/Well #	MWOI	
	1	=/	Adv	'anci	ina Oc	porti	ini	itv	Project:	Lambe 20	
		4				<i>p</i> • • • • •		->	Project #	0/7818055	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					15 16 17 18				Excavabi	ion backfill	$\begin{array}{c c} X & X \\ X & X$
	Moise	10.G	NO		19 20			SPSM			
		~			21 22 23 23	5		GP	LPOSE, It brow and gravel (in, Coarse Sand Cobbles 78" dinmeter	
	Dry	14.3	٨٩		24 25 26	-			Dense, dark	brown / black Siley	
	moise	>5,000	Yes Small		27 28 29 30	6		SC	band of Stain	ning, Strong Odor	
	moīse	1868	~1.5"		31 32 33 34 35	7		5M	Dense, 1t bi trace Clay e	rown, silty sand 10% NO Stain	
	•	18.6			36 37	+					

Schedule 40 PVCSolutionDiameter:Length:Total DealDealDealSchedule 40 PVC0.010"Length:Total Deal <th>Elevation: Detector: Gravel Pack: 10-20 Silica Sand Casing Type: Schedule 40 PVC</th> <th>PID</th> <th>Advancing O BAdvancing O BABE. 2nd Durango, O BORING LOG/MONITORIN Boring/Well Number: <u>MW 0 2</u> Date: <u>7/23/19</u> Logged By: <u>E. Corroll</u> Drilling Method: <u>Sonic</u> Seal: <u>Bertonite</u> Diameter: 2" 25</th> <th>Ave Colorado 81301 GWELL COMPLETIO Project: Lambe Project Number: 017818055 Drilled By: Cascad Sampling Method: Cont. nows Grout: Bent on te Hole Diameter:</th> <th>PN DIAGRAM 2C e</th>	Elevation: Detector: Gravel Pack: 10-20 Silica Sand Casing Type: Schedule 40 PVC	PID	Advancing O BAdvancing O BABE. 2nd Durango, O BORING LOG/MONITORIN Boring/Well Number: <u>MW 0 2</u> Date: <u>7/23/19</u> Logged By: <u>E. Corroll</u> Drilling Method: <u>Sonic</u> Seal: <u>Bertonite</u> Diameter: 2" 25	Ave Colorado 81301 GWELL COMPLETIO Project: Lambe Project Number: 017818055 Drilled By: Cascad Sampling Method: Cont. nows Grout: Bent on te Hole Diameter:	PN DIAGRAM 2C e
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Screen Type: Schedule 40 PVC	Slot: 0.010"	Diameter: Length:	Total Depth: 2 C	Depth to Water:
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Penetration Resistance Moisture Content Vapor (ppm) HC Staining?	[#] Depth Sample (ft. bgs.) Run	Lithology	y/Remarks	Well Completion
14 Loose, 12 brown coarse sand XX X	Dry 1.1 No Dry 1.3 No	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	SP-SM Dense, reddish bro some graves no s SP-SM SAA no Stail SP-SM SAA no Stail Loose, 12 brown	own Coarse Sand Stainlodgr hill Odar	X X X X X X X X X X X X X X X X X X X

									Boring/Well #	MWOZ	
	Kr	_/	Ad	ianci	na Or	nort	mi	ity I	Project:	Lambe DC	
		2	AUI	anun	ny op	φυπι	111	Ly	Project #	017818055	
C	/								Date	7/23/19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
	Dry	2.1	No		15 16 17 18 19 20 21 22 23	- 4		GP	Loose, It broc grave, Cobbles no Stain/od	wn Coarse Sand and 5 78" diameter lor -	
	Dry	3.5	NO	MW07 20'-75' 1400	24 - 25 -			GP	SAA nos	stain/odor	
	Wet	0.6	NO		26 27	+ + +		SM	Dense, it brown Silt <15% ni	n, Med. Sand Some O Stain Odol	
	mo:5c	0.4	Mu		28 29 30 31	6		GW SM	Compace, yellow No Stain/odd	brown Sandy Silb	
	moi st-	1.1	ND	Mwo7 30'-35' 1500	32 33 34 35 36 37	7		SC SM	COMPACE, dor Silby Some Clay Compace, Yellow No Stain/odor	K brown/black, Gandy y & 20th NO Stain/odor brown, Sandy Silt	
Elevation: Gravel Pack: 10-20 Silica Sarr Casing Type: Schedule 40 PV	Detector d	PID			Boring/Well Date: Logged By: Drilling Me Seal: Diameter:	Advancing Oppor 848 E. 2nd Ave Durango, Color NG LOG/MONITORING W Number: <u>Mwo 3</u> 7/13/19 <u>E. Carroll</u> thod: Sonic <u>Bentonike</u> 2" 25'	tunity rado 81301 ELL COMPLETIC Project: Droject Number: 0178180 Drilled By: COSCAQ Sampling Method: Contino Grout: Bentoni Hole Diameter:	DN DIAGRAM 22C 55 4e 25 5e Depth to Liquid: M^{+}			
---	---	--	---------------	----------	---	--	--	--			
Screen Type: Schedule 40 PV	С	Slot: 0.010"			Diameter:	2" Length: 15'	Total Depth: 34	Depth to Water:			
Penetration Resistance Moisture Content	Vapor (ppm) (HC Staining?	# Depth	Sample Run	Recovery	Soil/Rock Type	Lithology/Rer	narks	Well Completion			
Dry 0.	а <i>хо</i> <i>хо</i> 4 <i>№</i> 0.	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14	2		SP-SM SP-SM	Dry med. dense, rold Silby Sand (backfill) 1 SAA SAA	dich brown no Stain/odar	x x x x x x x x x x x x x x x x x x x			
0.6 0.	8 NP	15	-		SP-SM	SAA		x XX			

	~		>					Boring/Well # Mwo3			
	$\overline{1}$	-	Adv	<i>ranci</i>	ng Op	portu	m	ity	Project: Project #	Lambe 26	
	L				- 1			<i>.</i>	Date	7/23/19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					15 16 17 18	- - - - -		S₽-SМ	S:AA No 5	tain/odor	
	Dry	<i>4.4</i>	NO		19 20			68	LOOSE, 18 brok Cobbles ≥ 8" No stain,	un, Sand and grover	
	-				21 22 23	5					
	Dry	7.5	NO		24 25			GP	SAA No S	tain/odor	
	lvet	3.0	NP.		26 27	- - -		G.P.	Loose, dark led and graves, web	brown, coarse Sand no Stain/Odor	
	moise	3.3	NO		28 29 30	6		SM	dense, med s; c 10 ²⁷⁰ no Star	ity Sand, trace clay	
	הקיפרה מציפרה	5.0	NI		31 32	+ +- +		SC	D Compact, dash Some clay < 25	k brown/black, silty Sand 5% no Stain/odar	
	moise	5, 3	NΡ		33 34 35 36	7		SM	Dense, It brow Clay < 10% nl TD- 35	m silby sand, brace 0 spain/odor	
	-				37	Ŧ					¥/XX/

Elevation: Gravel Pack: 10-20 Silica Sand Casing Type: Schedule 40 PVC	Detector:	PID		B Bor Dat Log Dril Sea Dia	ORIN ing/Well e: ged By: ling Met l: meter:	Advancing Opport 848 E. 2nd Ave Durango, Color IG LOG/MONITORING WI Number: MWOH 7/34/19 E. Carroll thod: Spric Bentonit < 2" 25	tunity ado 81301 ELL COMPLETIO Project: Lambe Project Number: 01781801 Drilled By: CASCAD Sampling Method: CASCAD Grout: Benton / C	PN DIAGRAM 2C 55 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Schedule 40 PVC	0.	010"		Dia		2" <i>IS</i> ¹	35	Depth to Water:
Penetration Resistance Moisture Content Vapor (ppm)	HC Staining? Sample #	Depth (ft. bgs.)	ample Run	Kecovery Soil/Pool	Type	Lithology/Ren	narks	Well Completion
Dry 1.3 Dry 1.1 Dry 2.0	NO	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1 2 3	Si Si	P-5m	Dry, It. reddish bro SAA no Stain SAA no Stain, Loose, It. brown and grave (Cobble	n/odar coarse sand	x x x x x x x x x x x x x x x x x x x

				Boring/Well #	MWOH	
Advan	cina Onnol	rtuni	itv	Project:	Lambe 2c	
	enig opper		-9	Project #	017818055	
Penetration Resistance Moisture Content Vapor (ppm) Staining	Depth Samp (ft. bgs.) Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	R.	GP GP GP SM SM	Loose, It bra gravel, Cobbi no stain/ SAA, no S Loose, Satura And gravel, no Dense, It. brown Clay < 10% No SAA No TD	burn, Sand and les 78" diameter oder tain/odor ted, course Sand stain/oder n Siley sand, trace Stain/oder Stain/oder Stain/oder - 351	

Elevation: Detection Detec	or: PID		BORIT Boring/Wel Date: Logged By: Drilling Me Seal: Be Diameter:	Advancing Opport 848 E. 2nd Ave Durango, Color NG LOG/MONITORING WI IN Number: MW 0 5 7/24/19 E. Carroll thod: Sonic Entoni 24 Length:	tunity ado 81301 ELL COMPLETIC Project: Lambe Project Number: Ol 78/802 Drilled By: CASCOM Sampling Method: CONDING Grout: Bentonits Hole Diameter:	DN DIAGRAM
Schedule 40 PVC	Slot:		Diameter:	2" 2.5' Length:	Total Depth:	NA Depth to Water:
Schedule 40 PVC	0.010"	<u> </u>		2" 15'	35'	26'
Penetration Resistance Moisture Content Vapor (ppm	H H H H H H H H H H H H H H	Sample) Run	Recovery Soil/Rock Type	Lithology/Ren	narks	Well Completion
- web 0.8 NO	0		SP-SM	wet, dark redaisy brow	n, silby sand	()
	1 2 3 4 5	- - - - -	SP-SM	SAA no stainlodor		+* + + + + + + + + + +
Dry 1.3 NP	7 8 9 10 11 12 13 14	2	SF-SM	SAA no Stainlodd Loose, 16. brown, Sand	and graves	キャンキャキキャ
Dry 1.2 NO	15	-	GP	Cobbles 7 8" diameses	nossain/othr	₹) <

	-	-						Boring/Well #	MIN 125			
	K		Adv	iomol	na 0.	mort		i	Project:	Lambe 7C		
1		2	AUV	anci	ng up	ροπι	[[]]	ly	Project #			
									Date	7/24/19		
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	blogy/Remarks	Well Completion	
	Dry	<i>1</i> 9.9	NO	мшо5 15'-20' 940	15 16 17 18 19 20 21 22 23	- 4		G P G P	54A no s 54A no	stain lodor		
	Dry	13.4	N∕O		25		_	64			GW	
	Wes	6. 7	NO		20 27 28	6		SM	Dense, It. brown Clay < 10% NO), Silty Sond trace Stain/odor		
	moise	7.8	ΝΟ		29 30	-		SC	Dense, dork brod Some Clay e 25	wn block Silby Sand % No Stain/Oder		
	Μοίζε	7.2	No	Muras 30'-35' 1100	31 32 33 34 35 36 37			SM	Dense, 16 brown Clay < 10% nos	n, Silby Sand, Brace Bain / Odor		

Elevation: Gravel Pack:		Detector:		PID			BORIN Boring/Well Date: Logged By: Drilling Met	Advancing Opport 848 E. 2nd Ave Durango, Color G LOG/MONITORING W. Number: MWOG 7/22/19 E. C avr ol thod: Sonic	tunity Tado 81301 ELL COMPLETI Project: Lamb Project Number: 01761 Drilled By: Cascag Sampling Method: Continood Grout:	ON DIAGRAM e 2C & 0 55 /e ^ 5
Casing Type: Schedule 40	PVC						Diameter:	Length: 25	Hole Diameter:	Depth to Liquid:
Screen Type: Schedule 40	PVC		Slot: 0.0	10"			Diameter:	2" Length: /5 (Total Depth: 35	Depth to Water:
Penetration Resistance Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Ren	narks	Well Completion
	0.0	NO		0 1 2 3 4	- 7 7		SP-SM	Compact, 16. reddish grain poorly sorted,	brown, medium trace sile (b)	$\begin{array}{c c} -x & x \\ -x $
Dry	1.1	NO		5 6 7 8 9	2		GP	Loose, It. brown, P Coarse Sand and gran UP to 8" diameter	ood 14 Sorzed Vel, Cobbles	$- x + xx_{x}$ $- x + xx_{x}$ $+ x + x$ $+ x + x$ $+ x + x$ $+ x + x$
	g. 8			11 12 13 14 15	3		GP	SAA, Cobbles < 8" dia na Stain/oder	n met er	

	-	-						Boring/Well # MWOG			
	FT F		Adu	ianci	na Or	norti	mi	it.	Project:	Lambe 20	
		4	Aur	andi	ng op	φυπ		<i>Ly</i>	Project #	017818055	
							_		Date	7/22/19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	blogy/Remarks	Well Completion
	Dry	5.1	NO		15 16 17 18 19 20 21	4		69	SAA NOS	tain/odor	
	moise	19.9	NO	Mirob 70-25 5:15	22 23 24 25	5		GP	SAA no s	cain/odor	
	ives				26 27 28	Gw	~	GP	SAn No St	ain/odor	
	moise	1.6	ND		29	6		₿ SM	COMPOCE, dark Sand and sile, so Stain/oday	brown black, fine ome cay <1598 no	
	Moise	0.0	No	Mw06 30-35' 9:00	31 [.] 32 33 34 35 36 37	7		SM	Compace, lt b Some Clay <	rown, fine Sandy Sill 15% no Sbain/ador	

Elevation: Gravel Pack: 10-20 Silica Sand Casing Type: Schedule 40 PVC	Detector:	PID			BORIN Boring/Well Date: Drilling Met Diameter:	Advancing Oppor 848 E. 2nd Ave Durango, Color IG LOG/MONITORING W Number: MW07 7/23 /19 E. carroll hod: Sonic Bentonite 2" 25	rado 81301 ELL COMPLETIC Project: Project Number: 01781805 Drilled By: CaScade Sampling Method: Continous Grout: Bentont Hole Diameter:	DN DIAGRAM e 2C 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Schedule 40 PVC	Slot:	.010"		Ľ	Jameter:	2" Length: 15	Total Depth:	Depth to Water:
Penetration Resistance Moisture Content Vapor (ppm)	B HC Staining? Sample #	Depth Sa (ft. bgs.)	ample Run	Recovery	Soil/Rock Type	Lithology/Ren	narks	Well Completion
Dry 0.0	<i>₩</i> ⊅	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	2	4	SP-SM	Medillim dense, It re coarse sand, some (backsiv) no stain/add SAA NO Sbain/	odor	
 Moi5# 3.4	No	14 15		9	ip-sm	GAA NO Stain,	lodar	- x X - x X + x Y

	_						Boring/Well # MW07			
	_/	Adv	ianci	na Or	norti	m	ity I	Project:	Lambe 20	
	-	Auv	anun	ng op	φυτα		LY	Project #		
0	_							Date	7123/19	
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
	10.6	NO		15 16 17 18 19 20 21 22 23	- 4 - 4 - 5		GP	1005e, 18 610 and graves No Stain/1	- wm, Coarse Sand Cobbies > & " odar	XXX XX X X X X X X X X X X X X X X X X
m0;5t	17.8	No		23 _ 24 _ 25 _ 26 _ 27			GP	5A9 NOSF	nin/odar	
mgist	75,000	No	МW07)5-30 10:31	28 29 30 31	6		SM	Compact, fine <10%, no Stain	Sandy Silt, trace any Strong oder -	
moi55	42.3	No	Mw07 30°-35' 11:00	32 33 34 35 36 37	7		5C	Compace, fine Clay < 20%, TD=35'	e Sandy Silt Some no Stain/odar -	

Elevation: Gravel Pack: 10-20 Silica Casing Type:	Sand	Detector:		PID			BORIN Boring/Wei Date: Logged By: Drilling Mei Seal: Diameter:	Advancing Oppor 848 E. 2nd Ave Durango, Color NG LOG/MONITORING W I Number: MWO S 7/22/2019 E. Carrow thod: Sonic Bentonite Length: David	tunity rado 81301 ELL COMPLETIC Project: Lambe Project Number: OI 7 6 18 Drilled By: Cascade Sampling Method: Grout: Bentonit Hole Diameter:	DN DIAGRAM
Screen Type:	PVC		Slot:				Diameter:	2" 45 Length:	G'' Total Depth:	Depth to Water:
Penetration Resistance Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	2" ² S Lithology/Ren	narks	<i>G</i> ' Well Completion
	9, 0	N0 N0		0 1 2 3 4 5 6 7 8 9	7		SP-SM SP-SM	Compace, It. reddish bro Poorly Sorbed Sand, a SAN Loose, It brown, poor coarse Sand and grow up to 8" diameter Data big to	WN, medium trace Silt < 1076 	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Dry	0.9	NO		10 11 12 13 14 15	3		GP	SAA, Cobbles gre No Stain/odor	Pater than 6"-	CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

								Boring/Well # MWO8			
	K I		Adu	anai	na Or	norti	the	Project: Lambe 2C			
		2	Auv	anu	ng op	ρυπι		ly	Project #	017818055	
									Date	712212019	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithe	ology/Remarks	Well Completion
	Dry	1. 1	No		15 16 17 18 19 20 21	4		GP	SAA no	5tain/odor	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
	ргу	3.6	Ne		22 23 24 25	5		GP	SAA no St	ain/odor fine red Early Sound And Asabel	
	Moi 58	2.7	no		26 27 28 29 30	6		SM	Very dense, ycho Clay and silt nc	ow brown, Plasy O Stain I odor	
	Wi015E	3.0	NP		31 32 33 34 35 36 37	7		50	SAA noo TP=3	Stai'n /odor	

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

January 11, 2019

Devin Hencmann HILCORP ENERGY PO Box 4700 Farmington, NM 87499 TEL: (505) 564-0733 FAX

OrderNo.: 1901177

RE: Lambe 2C

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 2 sample(s) on 1/5/2019 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 <u>www.hallenvironmental.com</u> 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

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Analytical Report Lab Order 1901177 Date Reported: 1/11/2019

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Project: Lambe 2C

Client Sample ID: HA-1@9' Collection Date: 1/4/2019 11:00:00 AM Received Date: 1/5/2019 11:50:00 AM

Lab ID: 1901177-001	Matrix: SOIL	F	Received Date: 1/5/2019 11:50:00 AM						
Analyses	Result	PQL	Qual	Units	DF	Date Analyzed			
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS					Analyst: Irm			
Diesel Range Organics (DRO)	1000	97		mg/Kg	10	1/9/2019 3:07:21 PM			
Motor Oil Range Organics (MRO)	ND	490		mg/Kg	10	1/9/2019 3:07:21 PM			
Surr: DNOP	0	50.6-138	S	%Rec	10	1/9/2019 3:07:21 PM			
EPA METHOD 8015D: GASOLINE RANG	GE					Analyst: NSB			
Gasoline Range Organics (GRO)	3200	98		mg/Kg	20	1/9/2019 9:37:44 AM			
Surr: BFB	376	73.8-119	S	%Rec	20	1/9/2019 9:37:44 AM			
EPA METHOD 8021B: VOLATILES						Analyst: NSB			
Benzene	2.2	0.49		mg/Kg	20	1/9/2019 9:37:44 AM			
Toluene	57	0.98		mg/Kg	20	1/9/2019 9:37:44 AM			
Ethylbenzene	19	0.98		mg/Kg	20	1/9/2019 9:37:44 AM			
Xylenes, Total	210	2.0		mg/Kg	20	1/9/2019 9:37:44 AM			
Surr: 4-Bromofluorobenzene	130	80-120	S	%Rec	20	1/9/2019 9:37:44 AM			
EPA METHOD 300.0: ANIONS						Analyst: smb			
Chloride	ND	30		mg/Kg	20	1/9/2019 12:25:07 PM			

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	Е	Value above quantitation range
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits Page 1 of 6
	ND	Not Detected at the Reporting Limit	Р	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 1901177 Date Reported: 1/11/2019

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY Project: Lambe 2C

1901177-002

Lab ID:

Client Sample ID: HA-1@11' Collection Date: 1/4/2019 11:15:00 AM Received Date: 1/5/2019 11:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS					Analyst: Irm
Diesel Range Organics (DRO)	3800	93		mg/Kg	10	1/9/2019 3:55:20 PM
Motor Oil Range Organics (MRO)	ND	470		mg/Kg	10	1/9/2019 3:55:20 PM
Surr: DNOP	0	50.6-138	S	%Rec	10	1/9/2019 3:55:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	7300	940		mg/Kg	200	1/9/2019 7:01:49 PM
Surr: BFB	182	73.8-119	S	%Rec	200	1/9/2019 7:01:49 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	20	0.47		mg/Kg	20	1/9/2019 10:01:11 AM
Toluene	270	9.4		mg/Kg	200	1/9/2019 7:01:49 PM
Ethylbenzene	61	0.94		mg/Kg	20	1/9/2019 10:01:11 AM
Xylenes, Total	710	19		mg/Kg	200	1/9/2019 7:01:49 PM
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	200	1/9/2019 7:01:49 PM
EPA METHOD 300.0: ANIONS						Analyst: smb
Chloride	48	30		mg/Kg	20	1/9/2019 12:37:32 PM

Matrix: SOIL

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	Е	Value above quantitation range
	Н	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits Page 2 of 6
	ND	Not Detected at the Reporting Limit	Р	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#:	1901177
	11-Jan-19

Client: HILCOF	RP ENERG	Y								
Project: Lambe 2	C									
Sample ID MB-42496	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID: PBS	Batch	n ID: 42	496	F	RunNo: 5	6853				
Prep Date: 1/8/2019	Analysis D	Date: 1/	9/2019	S	SeqNo: 1	902954	Units: mg/H	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.7		10.00		96.8	50.6	138			
Sample ID LCS-42496	SampT	ype: LC	S	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID: LCSS	Batch	n ID: 42	496	F	RunNo: 5	6853				
Prep Date: 1/8/2019	Analysis D	0ate: 1/	9/2019	S	SeqNo: 1	902975	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	100	70	130			
Surr: DNOP	4.6		5.000		91.3	50.6	138			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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

Page 3 of 6

QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#:	1901177
	11-Jan-19

Client:	HILCOR	RP ENERGY								
Project:	Lambe 2	С								
Comple ID	MD 42404	CompTune			TaatCada	-DA Mathad	901ED: Case	line Deng	•	
Client ID:	MB-42491	Samp Type			Durble: 50070					
Dren Deter	FD3	Analysia Data	. 42491		Cocho:	10012		·		
Prep Date.	1/8/2019	Analysis Dale	. 1/9/2019		Seqino.	1903162	Units: mg/n	g		
Analyte		Result P	QL SPK va	lue SPK Re	f Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rano	ge Organics (GRO)	ND 980	5.0	000	98.0	73.8	119			
						10.0	110			
Sample ID	LCS-42491	SampType	E LCS		TestCode:	EPA Method	8015D: Gaso	line Rang	е	
Client ID:	LCSS	Batch ID	: 42491		RunNo:	56872				
Prep Date:	1/8/2019	Analysis Date	: 1/9/2019		SeqNo:	1903163	Units: mg/K	g		
Analyte		Result P	QL SPK va	lue SPK Re	f Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Ranç	ge Organics (GRO)	26	5.0 25	.00	0 103	80.1	123			
Surr: BFB		1100	10	000	110	73.8	119			
Sample ID	MB-42518	SampType	: MBLK		TestCode:	EPA Method	8015D: Gaso	line Rang	е	
Client ID:	PBS	Batch ID	: 42518		RunNo:	56885				
Prep Date:	1/9/2019	Analysis Date	: 1/10/2019		SeqNo:	1904141	Units: %Red	•		
Analyte		Result P	QL SPK va	lue SPK Re	f Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB		970	1(000	97.3	73.8	119			
Sample ID	LCS-42518		E LCS		TestCode:	EPA Method	8015D: Gaso	line Rang	e	
Client ID:	LCSS	Batch ID	42518		RunNo:	56885				
Prep Date:	1/9/2019	Analysis Date	: 1/10/2019		SeqNo:	1904142	Units: %Red	•		
Analyte		Result P			f.Val %REC	Low/ imit	Highl imit	% PPD	RPDI imit	Qual
Surr: BFB		1100	<u>ul SFRVa</u> 1(00	110	73.8	119	/0RF D	KF DLIIIII	Quai
					T 10 1 1					
Sample ID	MB-42514	SampType	: MBLK		TestCode:	EPA Method	8015D: Gaso	line Rang	е	
Client ID:	PBS	Batch ID	: 42514		RunNo:	56885				
Prep Date:	1/9/2019	Analysis Date	: 1/10/2019		SeqNo:	1904148	Units: %Red	•		
Analyte		Result P	QL SPK va	lue SPK Re	f Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB		940	10	000	94.1	73.8	119			
Sample ID	LCS-42514	SampType	ECS		TestCode:	EPA Method	8015D: Gaso	line Rang	e	
Client ID:	LCSS	Batch ID	: 42514		RunNo:	56885				
Prep Date:	1/9/2019	Analysis Date	: 1/10/2019		SeqNo:	1904149	Units: %Red	•		
Analvte		Result P	QL SPK va	lue SPK Re	f Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
		1100	1(00	110	73.8	119			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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

Page 4 of 6

Hall Er	nvironmen	tal Analy	ysis I	Laborat	ory, Inc.						11-Jan-19
Client: Project:	HILCC Lambe	ORP ENERG 2C	Y								
Sample ID	MB-42491	SampT	ype: MI	BLK	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batch	n ID: 42	491	F	RunNo: 5	6872				
Prep Date:	1/8/2019	Analysis D	ate: 1/	/9/2019	S	SeqNo: 1	903187	Units: mg/k	٢g		
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-Bron	nofluorobenzene	1.0		1.000		99.9	80	120			
Sample ID	LCS-42491	SampT	ype: LC	s	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batch	n ID: 42	491	F	≀unNo: 5	6872				
Prep Date:	1/8/2019	Analysis D	ate: 1/	/9/2019	S	SeqNo: 1	903188	Units: mg/ł	۲g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.92	0.025	1.000	0	92.1	80	120			
Toluene		0.96	0.050	1.000	0	96.2	80	120			
Ethylbenzene		0.97	0.050	1.000	0	96.8	80	120			
Xylenes, Total		2.9	0.10	3.000	0	97.9	80	120			
Surr: 4-Bron	nofluorobenzene	1.0		1.000		101	80	120			
Sample ID	MB-42518	SampT	ype: MI	BLK	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batch	n ID: 42	518	RunNo: 56885						
Prep Date:	1/9/2019	Analysis D	ate: 1/	/10/2019	S	SeqNo: 1	904170	Units: %Re	с		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bron	nofluorobenzene	0.99		1.000		99.4	80	120			
Sample ID	LCS-42518	SampT	ype: LC	s	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batch	n ID: 42	518	F	≀unNo: 5 0	6885				
Prep Date:	1/9/2019	Analysis D	ate: 1/	/10/2019	5	SeqNo: 1	904171	Units: %Re	с		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bron	nofluorobenzene	1.0		1.000		102	80	120			
Sample ID	MB-42514	SampT	уре: М	BLK	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batch	n ID: 42	514	F	RunNo: 5	6885				
Prep Date:	1/9/2019	Analysis D	ate: 1/	/10/2019	S	SeqNo: 1	904177	Units: %Re	с		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bron	nofluorobenzene	0.96		1.000		95.8	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

QC SUMMARY REPORT

- D Sample Diluted Due to Matrix
- Н 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
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Page 5 of 6

WO#: 1901177

QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#: **1901177** *11-Jan-19*

Client: HILCORP ENERGY

Project: Lambe 2C

Sample ID LCS-42514	SampT	ype: LC	s	Tes	tCode: El	PA Method	8021B: Volat	iles		
Client ID: LCSS	Batch	ID: 42	514	R	RunNo: 5	6885				
Prep Date: 1/9/2019	Analysis D	ate: 1/	10/2019	S	SeqNo: 1	904178	Units: %Red	6		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.96		1.000		96.0	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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

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HALL ENVIRONMENTAL ANALYSIS LABORATORY	Hall Environmental Albi TEL: 505-345-3975 Website: www.ha	Analy 49(uquerg FAX: tllenvit	sis Laboratory 11 Hawkins NE nue, NM 87109 505-345-4107 ronmental.com	Sa	mple Log-In Check List
Client Name: HILCORP ENERGY FAR	Work Order Number:	190	1177		RcptNo: 1
Received By: Anne Thorne	1/5/2019 11:50:00 AM		C	Im. Å	!
Completed By: Isaiah Ortiz	1/7/2019 3:12:49 PM			andre men (04
Reviewed By: ENM	1/7/9			··· •• •	
(B: DAD 1/7/19					
Chain of Custody					
1. Is Chain of Custody complete?		Yes	\checkmark	No 🗆	Not Present
2. How was the sample delivered?		<u>Cou</u>	<u>rier</u>		
l og in					
3. Was an attempt made to cool the samples	\$?	Yes		No 🗌	NA 🗌
					_
4. Were all samples received at a temperatur	re of >0° C to 6.0°C	Yes		No 🗀	
5. Sample(s) in proper container(s)?		Yes	\checkmark	No 🗌	
6. Sufficient sample volume for indicated test	:(s)?	Yes		No 🗆	
7. Are samples (except VOA and ONG) prope	erly 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 brol	ken?	Yes		No 🗹	
11. Does paperwork match bottle labels?		Yes		No 🗌	# of preserved bottles checked for pH:
(Note discrepancies on chain of custody)	f Ourstands O	V			(<2 or #12 unless noted) Adjusted?
12. Is it clear what analyses were requested?	of Custody?	Yes			
14. Were all holding times able to be met?		Yes			Checked by: DAD 1/-1/19
(If no, notify customer for authorization.)					
Special Handling (if applicable)					
15. Was client notified of all discrepancies with	h this order?	Yes		No 🗌	NA 🗹
Person Notified:	Date:				
By Whom:	Via:] eMa	ail 🗌 Phone	🗌 Fax	x 🔲 In Person
Regarding:			· · · · · · · · · · · · · · · · · · ·		
Client Instructions:	· · · · · · · · · · · · · · · · · · ·		·····		
16. Additional remarks:					
17. <u>Cooler Information</u>	Sea Mart Sea No. C	asi D	lia Cian	ad Bu	
1 1.3 Good Y	es	SOI D	aro orgin	сч СУ	

 HALL ENVIRONMENTAL HALL ENVIRONMENTAL ANALYSIS LABORATORY Www.hallenvironmental.com Hawkins NE - Albuquerque, NM 87109 Fax 505-345-4107 Fax 505-345-4107 Analysis Request 	TPH 8015B (GRO / DRO / MRO) TPH (Method 418.1) EDB (Method 504.1) PPH's (8310 or 8270 SIMS) Anions (F,CI,NO ₃ ,NO ₂ ,PO ₄ ,SO ₄) 8081 Pesticides / 8082 PCB's 8260B (VOA) 8270 (Semi-VOA) chlori des (300.0) chlori des (300.0)	I I I I I I I X I I I I I I X I I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I X I I I I I I I I I I I I I I I I I <t< th=""></t<>
	BTEX + MTBE + TPH (Gas only) BTEX + MTBE + TPH (Gas only)	
Turn-Around Time: X Standard Rush Project Name: Lambe えく Project #: 017818055	Project Manager: しどで 人 <i>Hercmann</i> Sampler: <i>Jash Mems</i> On loe: <u>XYes</u> INO On loe: <u>XYes</u> NO Sample Temperature:// <i>T CU 0.4 = / 3</i> Container Preservative HEAL NO. Type and # Type HEAL NO.	10.402 Cap 1 -001 -007 Perceived by: Date Time Date Time Date Time Date Time A. M. A.
Chain-of-Custody Record Client: Hikorp Energy _L48 West Sennifer Deal Mailing Address: Phone #: 505 - 324 - 5128	email or Fax#: Card Chilorp. com QA/QC Package: ACStandard I Level 4 (Full Validation) Accreditation I NELAP I Other X EDD (Type) ZDF Date Time Matrix Sample Request ID	I-4-16 I(100 So: 1 I/A-1 E T J I(115 J I/A-1 E T J I(115 J I/A-1 E T J I I I E I/A-1 E J I I I I I I Date: I I E I I Date: I I I I I Date: I I I I I I I I I I I I I I I I I I I I I I I I I I I I I



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

May 15, 2019

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

RE: Lambe 2C

OrderNo.: 1905231

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 5/4/2019 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

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Analytical Report
Lab Order 1905231

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 5/15/2019

CLIENT: Hilcorp Energy	Client Sample ID: GW01 Collection Date: 5/3/2019 2:00:00 PM									
Project: Lambe 2C										
Lab ID: 1905231-001	Matrix: AQUEOUS	Matrix: AQUEOUS Received Date: 5/4/2019 8:50:0								
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch			
EPA METHOD 8260B: VOLATILES						Analyst	DJF			
Benzene	2300	25		µg/L	50	5/7/2019 1:52:09 PM	R59702			
Toluene	4500	25		µg/L	50	5/7/2019 1:52:09 PM	R59702			
Ethylbenzene	210	25		µg/L	50	5/7/2019 1:52:09 PM	R59702			
Xylenes, Total	2600	38		µg/L	50	5/7/2019 1:52:09 PM	R59702			
Surr: 1,2-Dichloroethane-d4	109 7	0-130		%Rec	50	5/7/2019 1:52:09 PM	R59702			
Surr: 4-Bromofluorobenzene	92.5 7	0-130		%Rec	50	5/7/2019 1:52:09 PM	R59702			
Surr: Dibromofluoromethane	101 7	0-130		%Rec	50	5/7/2019 1:52:09 PM	R59702			
Surr: Toluene-d8	94.9 7	0-130		%Rec	50	5/7/2019 1:52:09 PM	R59702			

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 Limit

Page 1 of 8

Analytical Report
Lab Order 1905231

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 5/15/2019

CLIENT:	Hilcorp Energy
Project:	Lambe 2C

1905231-002

Lab ID:

Client Sample ID: GR01@28' Collection Date: 5/3/2019 2:05:00 PM

Matrix: MEOH (SOIL) Received Date: 5/4/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS					Analyst	том
Diesel Range Organics (DRO)	330	9.1		mg/Kg	1	5/7/2019 2:17:16 PM	44736
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/7/2019 2:17:16 PM	44736
Surr: DNOP	97.8	70-130		%Rec	1	5/7/2019 2:17:16 PM	44736
EPA METHOD 8015D: GASOLINE RANGE						Analyst	RAA
Gasoline Range Organics (GRO)	200	76		mg/Kg	20	5/6/2019 11:25:08 AM	G59658
Surr: BFB	191	73.8-119	S	%Rec	20	5/6/2019 11:25:08 AM	G59658
EPA METHOD 8021B: VOLATILES						Analyst	RAA
Benzene	ND	0.38		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Toluene	0.89	0.76		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Ethylbenzene	0.81	0.76		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Xylenes, Total	11	1.5		mg/Kg	20	5/6/2019 11:25:08 AM	R59658
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	20	5/6/2019 11:25:08 AM	R59658

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 Limit

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Analytical Report
Lab Order 1905231

Hall Environmental Analysis Laboratory, Inc.

Lab Order 1905231 Date Reported: 5/15/2019

CLIENT:	Hilcorp Energy
Project:	Lambe 2C

1905231-003

Lab ID:

Client Sample ID: GR02@29' Collection Date: 5/3/2019 2:20:00 PM

Matrix: MEOH (SOIL) Received Date: 5/4/2019 8:50:00 AM

Result	RL	Qual Units	DF	Date Analyzed	Batch
RGANICS				Analyst	том
ND	9.9	mg/Kg	1	5/7/2019 2:39:16 PM	44736
ND	50	mg/Kg	1	5/7/2019 2:39:16 PM	44736
93.9	70-130	%Rec	1	5/7/2019 2:39:16 PM	44736
				Analyst	RAA
ND	4.5	mg/Kg	1	5/6/2019 11:47:50 AM	G59658
95.9	73.8-119	%Rec	1	5/6/2019 11:47:50 AM	G59658
				Analyst	RAA
ND	0.023	mg/Kg	1	5/6/2019 11:47:50 AM	R59658
ND	0.045	mg/Kg	1	5/6/2019 11:47:50 AM	R59658
ND	0.045	mg/Kg	1	5/6/2019 11:47:50 AM	R59658
ND	0.090	mg/Kg	1	5/6/2019 11:47:50 AM	R59658
92.7	80-120	%Rec	1	5/6/2019 11:47:50 AM	R59658
	Result RGANICS ND 93.9 ND 95.9 ND ND ND ND ND ND ND 92.7	Result RL RGANICS ND 9.9 ND 50 93.9 70-130 ND 4.5 95.9 73.8-119 ND 0.023 ND 0.045 ND 0.045 ND 0.090 92.7 80-120	Result RL Qual Units RGANICS ND 9.9 mg/Kg ND 50 mg/Kg 93.9 70-130 %Rec ND 4.5 mg/Kg 95.9 73.8-119 %Rec ND 0.023 mg/Kg ND 0.045 mg/Kg ND 0.045 mg/Kg ND 0.090 mg/Kg	Result RL Qual Units DF RGANICS ND 9.9 mg/Kg 1 ND 50 mg/Kg 1 93.9 70-130 %Rec 1 ND 4.5 mg/Kg 1 95.9 73.8-119 %Rec 1 ND 0.023 mg/Kg 1 ND 0.045 mg/Kg 1 ND 0.045 mg/Kg 1 ND 0.090 mg/Kg 1 92.7 80-120 %Rec 1	Result RL Qual Units DF Date Analyzed RGANICS Analyst ND 9.9 mg/Kg 1 5/7/2019 2:39:16 PM ND 50 mg/Kg 1 5/7/2019 2:39:16 PM 93.9 70-130 %Rec 1 5/7/2019 2:39:16 PM 93.9 70-130 %Rec 1 5/7/2019 2:39:16 PM 93.9 70-130 %Rec 1 5/7/2019 2:39:16 PM MD 50 mg/Kg 1 5/7/2019 2:39:16 PM MD 50 mg/Kg 1 5/6/2019 11:47:50 AM ND 4.5 mg/Kg 1 5/6/2019 11:47:50 AM 95.9 73.8-119 %Rec 1 5/6/2019 11:47:50 AM ND 0.023 mg/Kg 1 5/6/2019 11:47:50 AM ND 0.045 mg/Kg 1 5/6/2019 11:47:50 AM ND 0.045 mg/Kg 1 5/6/2019 11:47:50 AM ND 0.090 mg/Kg 1 5/6/2019 11:47:

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

- 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 Limit

Page 3 of 8

S % Recovery outside of range due to dilution or matrix

Hilcorp Energy

Project: Lambe	2C									
Sample ID: LCS-44736	SampT	ype: LC	s	TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: LCSS	Batc	n ID: 44	736	F	RunNo: 5					
Prep Date: 5/6/2019	Analysis E	Date: 5/	7/2019	5	SeqNo: 2	012068	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	96.9	63.9	124			
Surr: DNOP	4.0		5.000		79.8	70	130			
Sample ID: MB-44736	SampT	ype: ME	BLK	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID: PBS	Batc	n ID: 44	736	F	RunNo: 5	9674				
Prep Date: 5/6/2019	Analysis E	Date: 5/	7/2019	S	SeqNo: 2	012069	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.7		10.00		97.0	70	130			

Qualifiers:

Client:

- * 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 Limit

WO#: **1905231** *15-May-19*

Client:Hilcorp EnergyProject:Lambe 2C

Sample ID: 2.5UG GRO LCS	SampT	SampType: LCS TestCode: EPA Method						8015D: Gasoline Range				
Client ID: LCSS	Batc	n ID: G5	9658	F	RunNo: 5	9658						
Prep Date:	Analysis Date: 5/6/2019			S	SeqNo: 2011127 Units: mg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.5	80.1	123					
Surr: BFB	1000		1000		104	73.8	119					
	SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range											
Sample ID: RB	SampT	уре: МЕ	BLK	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	е			
Sample ID: RB Client ID: PBS	Samp1 Batcl	ype: ME n ID: G5	3LK 9658	Tes F	tCode: El RunNo: 5	PA Method 9658	8015D: Gaso	oline Rang	e			
Sample ID: RB Client ID: PBS Prep Date:	SampT Batcl Analysis D	⁻ ype: ME n ID: G5 Date: 5/	BLK 9658 6/2019	Tes F S	tCode: El RunNo: 5 SeqNo: 2	PA Method 9658 011128	8015D: Gaso Units: mg/k	bline Rang	e			
Sample ID: RB Client ID: PBS Prep Date: Analyte	SampT Batch Analysis D Result	⁻ ype: MB n ID: G5 Date: 5/ 0 PQL	BLK 9658 6/2019 SPK value	Tes F S SPK Ref Val	tCode: El RunNo: 5 SeqNo: 2 %REC	PA Method 9658 011128 LowLimit	8015D: Gaso Units: mg/k HighLimit	oline Rang (g %RPD	e RPDLimit	Qual		
Sample ID: RB Client ID: PBS Prep Date: Analyte Gasoline Range Organics (GRO)	SampT Batch Analysis D Result ND	ype: ME n ID: G5 Date: 5 / PQL 5.0	BLK 9658 6/2019 SPK value	Tes F SPK Ref Val	tCode: El RunNo: 5 SeqNo: 2 %REC	PA Method 9658 011128 LowLimit	8015D: Gaso Units: mg/K HighLimit	oline Rang (g %RPD	e 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 Limit

Client:Hilcorp EnergyProject:Lambe 2C

Sample ID: 100NG BTEX LCS	SampT	SampType: LCS TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batcl	n ID: R5	9658	F	RunNo: 5 9	9658				
Prep Date:	Analysis E)ate: 5/	6/2019	S	SeqNo: 2	011130	Units: mg/k	٤g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	109	80	120			
Toluene	0.93	0.050	1.000	0	93.1	80	120			
Ethylbenzene	0.91	0.050	1.000	0	91.2	80	120			
Xylenes, Total	2.7	0.10	3.000	0	89.7	80	120			
Surr: 4-Bromofluorobenzene	0.94		1.000		93.6	80	120			
	D: RB SampType: MBLK TestCode: EPA Method 8021B: Volatiles									
Sample ID: RB	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Sample ID: RB Client ID: PBS	SampT Batcl	ype: ME D: R5	3LK 9658	Tes F	tCode: El	PA Method 9658	8021B: Volat	tiles		
Sample ID: RB Client ID: PBS Prep Date:	SampT Batcl Analysis D	⁻ ype: ME n ID: R5 Date: 5 /	3LK 9658 6/2019	Tes F S	tCode: El RunNo: 59 SeqNo: 20	PA Method 9658 011140	8021B: Volat Units: mg/k	tiles (g		
Sample ID: RB Client ID: PBS Prep Date: Analyte	SampT Batch Analysis D Result	⁻ ype: ME n ID: R5 Date: 5/ PQL	BLK 9658 6/2019 SPK value	Tes F S SPK Ref Val	tCode: EI RunNo: 59 SeqNo: 20 %REC	PA Method 9658 011140 LowLimit	8021B: Volat Units: mg/k HighLimit	tiles (g %RPD	RPDLimit	Qual
Sample ID: RB Client ID: PBS Prep Date: Analyte Benzene	SampT Batch Analysis D Result ND	ype: ME n ID: R5 Date: 5 / PQL 0.025	BLK 9658 6/2019 SPK value	Tes F S SPK Ref Val	tCode: El RunNo: 5 SeqNo: 20 %REC	PA Method 9658 011140 LowLimit	8021B: Volat Units: mg/K HighLimit	tiles Kg %RPD	RPDLimit	Qual
Sample ID: RB Client ID: PBS Prep Date: Analyte Benzene Toluene	SampT Batch Analysis D Result ND ND	⁻ ype: ME n ID: R5 Date: 5/ PQL 0.025 0.050	BLK 9658 6/2019 SPK value	Tes F SPK Ref Val	tCode: El RunNo: 59 SeqNo: 20 %REC	PA Method 9658 011140 LowLimit	8021B: Volat Units: mg/K HighLimit	tiles (g %RPD	RPDLimit	Qual
Sample ID: RB Client ID: PBS Prep Date: Analyte Benzene Toluene Ethylbenzene	SampT Batcl Analysis D Result ND ND ND	ype: ME Date: 5/ PQL 0.025 0.050 0.050	BLK 9658 6/2019 SPK value	Tes F SPK Ref Val	tCode: El RunNo: 59 SeqNo: 20 %REC	PA Method 9658 011140 LowLimit	8021B: Volat Units: mg/k HighLimit	tiles (g %RPD	RPDLimit	Qual
Sample ID: RB Client ID: PBS Prep Date: Analyte Benzene Toluene Ethylbenzene Xylenes, Total	Samp1 Batcl Analysis D Result ND ND ND ND	Type: ME n ID: R5 Date: 5/ PQL 0.025 0.050 0.050 0.10	BLK 9658 6/2019 SPK value	Tes F SPK Ref Val	tCode: El RunNo: 59 SeqNo: 20 %REC	PA Method 9658 011140 LowLimit	8021B: Volat Units: mg/k HighLimit	tiles (g %RPD	RPDLimit	Qual

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
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- E Value above quantitation range
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- P Sample pH Not In Range
- RL Reporting Limit

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Hall Environment	al Anal	ysis I	Laborat	ory, Inc.						15-May-19
Client: Hilcorp Project: Lambe 2	Energy 2C									
Sample ID: rb	SampT	ype: ME	BLK	Tes	tCode: EF	PA Method	8260B: VOL	ATILES		
Client ID: PBW	Batcl	n ID: R5	9702	F	RunNo: 59702					
Prep Date:	Analysis E	Date: 5/	7/2019	S	SegNo: 20	012832	Units: µa/L			
Analyte	Result	POI	SPK value	SPK Rof Val	%REC	Lowl imit	Highl imit	%RPD	RPDI imit	Qual
Benzene	ND	1.0			/iiiieo	LOWEIIIII	riigitEittiit	/ortr D		Quui
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.6	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.1	70	130			
Surr: Toluene-d8	9.4		10.00		94.3	70	130			
Sample ID: 100ng Ics	SampT	ype: LC	s	Tes	tCode: EF	PA Method	8260B: VOL	ATILES		
Client ID: LCSW	Batc	n ID: R5	9702	F	RunNo: 5 9	9702				
Prep Date:	Analysis E	Date: 5/	7/2019	5	SeqNo: 20	012843	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	18	1.0	20.00	0	88.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.2		10.00		92.5	70	130			
Surr: 4-Bromofluorobenzene	9.0		10.00		90.2	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.4	70	130			
Surr: Toluene-d8	9.2		10.00		91.7	70	130			
Sample ID: 1905231-001a m	s SampT	уре: М	6	Tes	tCode: EF	PA Method	8260B: VOL	ATILES		
Client ID: GW01	Batcl	n ID: R5	9702	F	RunNo: 5 9	9702				
Prep Date:	Analysis E	Date: 5/	7/2019	S	SeqNo: 20	012908	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3400	50	1000	2324	106	70	130			_
loluene	5300	50	1000	4507	80.8	70	130			E
Surr: 1,2-Dichloroethane-d4	540		500.0		108	70	130			
Surr: 4-Bromofluorobenzene	470		500.0		94.6	70	130			
	510		500.0		103	70	130			
Surr: Toluene-d8	500		500.0		99.2	70	130			
Sample ID: 1905231-001a m	sd SampT	уре: М	SD	Tes	tCode: EF	PA Method	8260B: VOL	ATILES		
Client ID: GW01	Batc	n ID: R5	9702	F	RunNo: 59	9702				
Prep Date:	Analysis E	Date: 5/	7/2019	S	SeqNo: 20)12909	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	3400	50	1000	2324	107	70	130	0.207	20	
Ioluene	5200	50	1000	4507	67.4	70	130	2.56	20	ES

Qualifiers:

- Value exceeds Maximum Contaminant Level. *
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit

QC SUMMARY REPORT

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits

Р Sample pH Not In Range

RL Reporting Limit

QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#: **1905231** *15-May-19*

Client:Hilcorp EnergyProject:Lambe 2C

Sample ID: 1905231-001a msd SampType: MSD TestCode: EPA Method 8260B: VO										
Client ID: GW01	Batch	Batch ID: R59702 RunNo: 59702								
Prep Date:	Analysis D)ate: 5/	7/2019	S	SeqNo: 2	012909	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	540		500.0		108	70	130	0	0	
Surr: 4-Bromofluorobenzene	460		500.0		91.7	70	130	0	0	
Surr: Dibromofluoromethane	510		500.0		102	70	130	0	0	
Surr: Toluene-d8	470		500.0		94.9	70	130	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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 Limit

HALL ENVIR ANALY LABOR	ONMENT SIS Atory	AL	Hall TEL W	Environmen A : 505-345-39 'ebsite: www.	tal Analysis Labor 4901 Hawkin Ibuquerque, NM 8 75 FAX: 505-345- hallenvironmenta	atory 98 NE 7109 San 4107 2.com	ample Log-In Check List				
Client Name:	HILCORP	ENERGY	Work (Order Numb	er: 1905231		RcptNo:	1			
Received By:	Isaiah Ori	tiz	5/4/2019	8:50:00 AN	Λ	I_0	×				
Completed By: Reviewed By: しろ・	Yazmine YGS S	Garduno 4 14 6-19	5/4/2019	10:08:42 A	Μ	Yognini lifndesto					
Chain of Cust	tody				_						
1. Is Chain of Cu	stody comp	lete?			Yes 🗹	No	Not Present				
2. How was the s	ample deliv	vered?			Courier						
Log In 3. Was an attemp	pt made to c	cool the samp	les?		Yes ✔	No 🗌	NA 🗌				
4. Were all samp	les received	l at a tempera	iture of >0° C to	o 6.0°C	Yes 🖌	No 🗌	NA 🗌				
5. Sample(s) in p	roper conta	iner(s)?			Yes 🗹	No 🗌					
6. Sufficient samp	ole volume f	or indicated to	est(s)?		Yes 🗹	No 🗌					
7. Are samples (e	except VOA	and ONG) pr	operly preserved	1?	Yes 🗹	No 🗌					
8. Was preservati	ive added to	bottles?			Yes 🗌	No 🔽	NA 🗌				
9. VOA vials have	e zero heads	space?			Yes 🗌	No 🗌	No VOA Vials 🗹				
10. Were any sam	ple containe	ers received b	oroken?		Yes	No 🗹	# of preserved				
11. Does paperwor (Note discrepa	rk match bo ncies on cha	ttle labels? ain of custody)		Yes 🔽	No 🗌	bottles checked for pH:	>12 unless noted)			
12. Are matrices co	orrectly iden	tified on Chai	n of Custody?		Yes 🗹	No 🗌	Adjusted?				
13. Is it clear what	analyses we	ere requested	1?		Yes 🗸	No 🗌		_			
14. Were all holdin (If no, notify cu	g times able stomer for a	e to be met? authorization.)			Yes 🗹	No	Checked by:	JJC 5-6-19			
Special Handli	na (if apr	olicable)									
15. Was client not	ified of all d	iscrepancies	with this order?		Yes	No 🗌	NA 🔽				
Person N	Notified:	Г		Date	r	and the second					
By Whor	m:	Г Г		Via:	⊫ ∏eMail ∏ F	hone 🗌 Fax	In Person				
Regardir	ng:		a account of the second	following the state of the stat							
Client In:	structions:	I									
16. Additional rem	narks:										
17. <u>Cooler Inform</u>	nation	a Laboration									
Cooler No 1	Temp °C 2.4	Condition Good	Seal Intact Yes	Seal No	Seal Date	Signed By					

 \sum



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

June 10, 2019

Jennifer Deal HILCORP ENERGY PO Box 4700 Farmington, NM 87499 TEL: (505) 564-0733 FAX:

OrderNo.: 1905E09

Dear Jennifer Deal:

RE: Lambe 2C

Hall Environmental Analysis Laboratory received 9 sample(s) on 5/30/2019 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

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Analytical Report
Lab Order 1905E09

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 6/10/2019

CLIENT: HILCORP ENERGY	Client Sample ID: GR03@28'								
Project: Lambe 2C	Collection Date: 5/29/2019 10:30:00 AM								
Lab ID: 1905E09-001	Matrix: SOIL Received Date: 5/30/2019 8:00:00 AM								
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch			
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst	том			
Diesel Range Organics (DRO)	ND	9.1	mg/Kg	1	6/4/2019 12:31:15 PM	45307			
Motor Oil Range Organics (MRO)	ND	46	mg/Kg	1	6/4/2019 12:31:15 PM	45307			
Surr: DNOP	120	70-130	%Rec	1	6/4/2019 12:31:15 PM	45307			
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst	NSB			
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	6/3/2019 5:13:10 PM	45298			
Surr: BFB	91.0	73.8-119	%Rec	1	6/3/2019 5:13:10 PM	45298			
EPA METHOD 8021B: VOLATILES					Analyst	NSB			
Benzene	ND	0.024	mg/Kg	1	6/3/2019 5:13:10 PM	45298			
Toluene	ND	0.048	mg/Kg	1	6/3/2019 5:13:10 PM	45298			
Ethylbenzene	ND	0.048	mg/Kg	1	6/3/2019 5:13:10 PM	45298			
Xylenes, Total	ND	0.096	mg/Kg	1	6/3/2019 5:13:10 PM	45298			
Surr: 4-Bromofluorobenzene	94.7	80-120	%Rec	1	6/3/2019 5:13:10 PM	45298			

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

- 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 Limit

Page 1 of 12

S % Recovery outside of range due to dilution or matrix

Analytical Report
Lab Order 1905E09

Date Reported: 6/10/2019

CLIENT: HILCORP ENERGY Project: Lambe 2C Lab ID: 1905E09-002	Client Sample ID: GR04@28' Collection Date: 5/29/2019 10:35:00 AM Matrix: SOIL Received Date: 5/30/2019 8:00:00 AM								
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch		
EPA METHOD 8015M/D: DIESEL RANG	GE ORGANICS					Analyst	: том		
Diesel Range Organics (DRO)	1000	95		mg/Kg	10	6/4/2019 12:55:30 PM	45307		
Motor Oil Range Organics (MRO)	ND	480		mg/Kg	10	6/4/2019 12:55:30 PM	45307		
Surr: DNOP	0	70-130	S	%Rec	10	6/4/2019 12:55:30 PM	45307		
EPA METHOD 8015D: GASOLINE RAN	GE					Analyst	RAA		
Gasoline Range Organics (GRO)	550	47		mg/Kg	10	6/4/2019 4:13:09 PM	45298		
Surr: BFB	522	73.8-119	S	%Rec	10	6/4/2019 4:13:09 PM	45298		
EPA METHOD 8021B: VOLATILES						Analyst	NSB		
Benzene	0.045	0.024		mg/Kg	1	6/3/2019 6:21:17 PM	45298		
Toluene	2.5	0.047		mg/Kg	1	6/3/2019 6:21:17 PM	45298		
Ethylbenzene	2.5	0.047		mg/Kg	1	6/3/2019 6:21:17 PM	45298		
Xylenes, Total	37	0.94		mg/Kg	10	6/4/2019 4:13:09 PM	45298		
Surr: 4-Bromofluorobenzene	386	80-120	S	%Rec	1	6/3/2019 6:21:17 PM	45298		

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

Hall Environmental Analysis Laboratory, Inc.

- NDNot Detected at the Reporting LimitPQLPractical 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 Limit

Page 2 of 12
Hall Environmental Analysis Laboratory, Inc.

Date Reported: 6/10/2019

CLIENT:	HILCORP ENERGY		Cl	lient Sa	ample II	D:G	R05@28'	
Project:	Lambe 2C			Collect	ion Dat	e: 5/2	29/2019 10:40:00 AM	
Lab ID:	1905E09-003	Matrix: SOIL		Recei	ved Dat	e: 5/.	30/2019 8:00:00 AM	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA ME	THOD 8015M/D: DIESEL RAN	GE ORGANICS					Analyst	том
Diesel R	ange Organics (DRO)	420	9.2		mg/Kg	1	6/4/2019 1:20:04 PM	45307
Motor O	il Range Organics (MRO)	ND	46		mg/Kg	1	6/4/2019 1:20:04 PM	45307
Surr:	DNOP	119	70-130		%Rec	1	6/4/2019 1:20:04 PM	45307
EPA ME	THOD 8015D: GASOLINE RAN	IGE					Analyst	: NSB
Gasoline	e Range Organics (GRO)	50	4.8		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Surr:	BFB	540	73.8-119	S	%Rec	1	6/3/2019 7:51:49 PM	45298
EPA ME	THOD 8021B: VOLATILES						Analyst	NSB
Benzene	9	ND	0.024		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Toluene		ND	0.048		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Ethylber	izene	ND	0.048		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Xylenes,	Total	1.4	0.097		mg/Kg	1	6/3/2019 7:51:49 PM	45298
Surr: 4	4-Bromofluorobenzene	128	80-120	S	%Rec	1	6/3/2019 7:51:49 PM	45298

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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 6/10/2019

CLIENT:	HILCORP ENERGY		Cl	ient Sa	ample II	D: GR	.06@28'	
Project:	Lambe 2C		(Collect	ion Dat	e: 5/2	9/2019 10:45:00 AM	
Lab ID:	1905E09-004	Matrix: SOIL		Recei	ved Dat	e: 5/3	0/2019 8:00:00 AM	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA MET	HOD 8015M/D: DIESEL RAI	NGE ORGANICS					Analyst	: ТОМ
Diesel R	ange Organics (DRO)	2200	98		mg/Kg	10	6/4/2019 1:44:27 PM	45307
Motor Oi	Range Organics (MRO)	ND	490		mg/Kg	10	6/4/2019 1:44:27 PM	45307
Surr: [DNOP	0	70-130	S	%Rec	10	6/4/2019 1:44:27 PM	45307
EPA MET	HOD 8015D: GASOLINE RA	NGE					Analyst	: NSB
Gasoline	Range Organics (GRO)	2600	98		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Surr: E	3FB	824	73.8-119	S	%Rec	20	6/3/2019 8:37:13 PM	45298
EPA MET	HOD 8021B: VOLATILES						Analyst	: NSB
Benzene		ND	0.49		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Toluene		35	0.98		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Ethylben	zene	21	0.98		mg/Kg	20	6/3/2019 8:37:13 PM	45298
Xylenes,	Total	220	20		mg/Kg	200	6/4/2019 4:36:26 PM	45298
Surr: 4	I-Bromofluorobenzene	158	80-120	S	%Rec	20	6/3/2019 8:37:13 PM	45298

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 Limit

Page 4 of 12

Date Reported: 6/10/2019

CLIENT: HILCORP ENERGY Project: Lambe 2C	Client Sample ID: GR07@23' Collection Date: 5/29/2019 11:10:00 AM										
Lab ID: 1905E09-005	Matrix: SOILReceived Date: 5/30/2019 8:00:00 AM										
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch					
EPA METHOD 8015M/D: DIESEL RANG	GE ORGANICS				Analyst	: том					
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	6/4/2019 2:08:55 PM	45307					
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	6/4/2019 2:08:55 PM	45307					
Surr: DNOP	126	70-130	%Rec	1	6/4/2019 2:08:55 PM	45307					
EPA METHOD 8015D: GASOLINE RAN	IGE				Analyst	: NSB					
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	6/3/2019 8:59:52 PM	45298					
Surr: BFB	98.7	73.8-119	%Rec	1	6/3/2019 8:59:52 PM	45298					
EPA METHOD 8021B: VOLATILES					Analyst	RAA					
Benzene	ND	0.024	mg/Kg	1	6/4/2019 4:59:44 PM	45298					
Toluene	ND	0.048	mg/Kg	1	6/4/2019 4:59:44 PM	45298					
Ethylbenzene	ND	0.048	mg/Kg	1	6/4/2019 4:59:44 PM	45298					
Xylenes, Total	ND	0.097	mg/Kg	1	6/4/2019 4:59:44 PM	45298					
Surr: 4-Bromofluorobenzene	92.8	80-120	%Rec	1	6/4/2019 4:59:44 PM	45298					

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

Hall Environmental Analysis Laboratory, Inc.

- 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 Limit

Page 5 of 12

Date Reported: 6/10/2019

CLIENT: HILCORP ENERGY		Cl	ient Sample II	D: G	R08@25'	
Project: Lambe 2C		(Collection Dat	e: 5/2	29/2019 11:15:00 AM	
Lab ID: 1905E09-006	Matrix: SOIL		Received Dat	e: 5/.	30/2019 8:00:00 AM	
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst	том
Diesel Range Organics (DRO)	ND	9.9	mg/Kg	1	6/4/2019 2:33:11 PM	45307
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	6/4/2019 2:33:11 PM	45307
Surr: DNOP	117	70-130	%Rec	1	6/4/2019 2:33:11 PM	45307
EPA METHOD 8015D: GASOLINE RANG	GE				Analyst	: NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	6/3/2019 9:22:58 PM	45298
Surr: BFB	97.2	73.8-119	%Rec	1	6/3/2019 9:22:58 PM	45298
EPA METHOD 8021B: VOLATILES					Analyst	: NSB
Benzene	ND	0.024	mg/Kg	1	6/3/2019 9:22:58 PM	45298
Toluene	ND	0.048	mg/Kg	1	6/3/2019 9:22:58 PM	45298
Ethylbenzene	ND	0.048	mg/Kg	1	6/3/2019 9:22:58 PM	45298
Xylenes, Total	ND	0.096	mg/Kg	1	6/3/2019 9:22:58 PM	45298
Surr: 4-Bromofluorobenzene	91.0	80-120	%Rec	1	6/3/2019 9:22:58 PM	45298

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

Hall Environmental Analysis Laboratory, Inc.

- 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 Limit

Page 6 of 12

Date Reported: 6/10/2019

CLIENT: HILCORP ENERGY		Cl	ient Sample II	D: G	R09@25'	
Project: Lambe 2C		(Collection Dat	e: 5/2	29/2019 11:20:00 AM	
Lab ID: 1905E09-007	Matrix: SOIL		Received Dat	e: 5/.	30/2019 8:00:00 AM	
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst	: ТОМ
Diesel Range Organics (DRO)	ND	9.3	mg/Kg	1	6/5/2019 8:27:34 AM	45307
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	6/5/2019 8:27:34 AM	45307
Surr: DNOP	100	70-130	%Rec	1	6/5/2019 8:27:34 AM	45307
EPA METHOD 8015D: GASOLINE RANG	GE				Analyst	: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	6/3/2019 9:45:59 PM	45298
Surr: BFB	94.7	73.8-119	%Rec	1	6/3/2019 9:45:59 PM	45298
EPA METHOD 8021B: VOLATILES					Analyst	: NSB
Benzene	ND	0.023	mg/Kg	1	6/3/2019 9:45:59 PM	45298
Toluene	ND	0.047	mg/Kg	1	6/3/2019 9:45:59 PM	45298
Ethylbenzene	ND	0.047	mg/Kg	1	6/3/2019 9:45:59 PM	45298
Xylenes, Total	ND	0.093	mg/Kg	1	6/3/2019 9:45:59 PM	45298
Surr: 4-Bromofluorobenzene	92.1	80-120	%Rec	1	6/3/2019 9:45:59 PM	45298

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

Hall Environmental Analysis Laboratory, Inc.

- 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 Limit

Page 7 of 12

Date Reported: 6/10/2019

CLIENT: HILCORP ENERGY		Cl	ient Sample II): G	R10@23'	
Project: Lambe 2C		(Collection Dat	e: 5/2	29/2019 11:25:00 AM	
Lab ID: 1905E09-008	Matrix: SOIL		Received Dat	e: 5/.	30/2019 8:00:00 AM	
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst	: ТОМ
Diesel Range Organics (DRO)	ND	9.2	mg/Kg	1	6/5/2019 8:52:56 AM	45307
Motor Oil Range Organics (MRO)	ND	46	mg/Kg	1	6/5/2019 8:52:56 AM	45307
Surr: DNOP	95.3	70-130	%Rec	1	6/5/2019 8:52:56 AM	45307
EPA METHOD 8015D: GASOLINE RAN	GE				Analyst	: NSB
Gasoline Range Organics (GRO)	ND	4.6	mg/Kg	1	6/3/2019 10:08:56 PM	45298
Surr: BFB	95.5	73.8-119	%Rec	1	6/3/2019 10:08:56 PM	45298
EPA METHOD 8021B: VOLATILES					Analyst	: NSB
Benzene	ND	0.023	mg/Kg	1	6/3/2019 10:08:56 PM	45298
Toluene	ND	0.046	mg/Kg	1	6/3/2019 10:08:56 PM	45298
Ethylbenzene	ND	0.046	mg/Kg	1	6/3/2019 10:08:56 PM	45298
Xylenes, Total	ND	0.093	mg/Kg	1	6/3/2019 10:08:56 PM	45298
Surr: 4-Bromofluorobenzene	96.3	80-120	%Rec	1	6/3/2019 10:08:56 PM	45298

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

Hall Environmental Analysis Laboratory, Inc.

- 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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 6/10/2019

CLIENT:	HILCORP ENERGY		Cl	ient Sample II): FS	501@29'						
Project:	Lambe 2C		(Collection Dat	e: 5/2	29/2019 11:30:00 AM						
Lab ID:	1905E09-009	Matrix: SOIL	Received Date: 5/30/2019 8:00:00 AM									
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch					
EPA MET	HOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst	том					
Diesel R	ange Organics (DRO)	ND	10	mg/Kg	1	6/5/2019 9:16:47 AM	45307					
Motor Oi	Range Organics (MRO)	ND	50	mg/Kg	1	6/5/2019 9:16:47 AM	45307					
Surr: [DNOP	90.2	70-130	%Rec	1	6/5/2019 9:16:47 AM	45307					
EPA MET	HOD 8015D: GASOLINE RAI	NGE				Analyst	NSB					
Gasoline	Range Organics (GRO)	ND	4.9	mg/Kg	1	6/3/2019 10:31:51 PM	45298					
Surr: E	BFB	94.3	73.8-119	%Rec	1	6/3/2019 10:31:51 PM	45298					
EPA MET	HOD 8021B: VOLATILES					Analyst	: NSB					
Benzene		ND	0.024	mg/Kg	1	6/3/2019 10:31:51 PM	45298					
Toluene		ND	0.049	mg/Kg	1	6/3/2019 10:31:51 PM	45298					
Ethylben	zene	ND	0.049	mg/Kg	1	6/3/2019 10:31:51 PM	45298					
Xylenes,	Total	ND	0.097	mg/Kg	1	6/3/2019 10:31:51 PM	45298					
Surr: 4	I-Bromofluorobenzene	95.7	80-120	%Rec	1	6/3/2019 10:31:51 PM	45298					

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

- 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 Limit

Page 9 of 12

S % Recovery outside of range due to dilution or matrix

WO#: **1905E09**

10-Jun-19

Client:HILCORP ENERGYProject:Lambe 2C

Sample ID: LCS-45307	SampT	ype: LC	S	TestCode: EPA Method 8015M/D: Diesel Range Organics						
Client ID: LCSS	Batch	h ID: 45	307	F	RunNo: 6					
Prep Date: 5/31/2019	Analysis D	Date: 6/	4/2019	S	SeqNo: 20	041753	Units: mg/K	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	104	63.9	124			
Surr: DNOP	5.3		5.000		105	70	130			
	SampType: MBLK TestCode: EPA Method 8015M/D: Diesel Range Organics									
Sample ID: MB-45307	SampT	ype: ME	BLK	Tes	tCode: EF	PA Method	8015M/D: Die	esel Range	e Organics	
Sample ID: MB-45307 Client ID: PBS	SampT Batcl	ype: ME h ID: 45	3LK 307	Tes F	tCode: Ef	PA Method 0359	8015M/D: Die	esel Range	e Organics	
Sample ID: MB-45307 Client ID: PBS Prep Date: 5/31/2019	SampT Batch Analysis D	⁻ ype: ME n ID: 45 Date: 6 /	3LK 307 4/2019	Tes F S	tCode: EF RunNo: 66 SeqNo: 26	PA Method 0359 041754	8015M/D: Die Units: mg/K	esel Range	e Organics	
Sample ID: MB-45307 Client ID: PBS Prep Date: 5/31/2019 Analyte	SampT Batcl Analysis D Result	Type: ME In ID: 45 Date: 6 / PQL	3LK 307 4/2019 SPK value	Tes F S SPK Ref Val	tCode: EF RunNo: 66 SeqNo: 26 %REC	PA Method 0359 041754 LowLimit	8015M/D: Die Units: mg/K HighLimit	esel Rango ág %RPD	e Organics	Qual
Sample ID: MB-45307 Client ID: PBS Prep Date: 5/31/2019 Analyte Diesel Range Organics (DRO)	SampT Batch Analysis D Result ND	Type: ME h ID: 45 Date: 6 PQL 10	3LK 307 4/2019 SPK value	Tes F S SPK Ref Val	tCode: EF RunNo: 66 SeqNo: 26 %REC	PA Method 0359 041754 LowLimit	8015M/D: Die Units: mg/K HighLimit	esel Rango Xg %RPD	e Organics	Qual
Sample ID: MB-45307 Client ID: PBS Prep Date: 5/31/2019 Analyte Diesel Range Organics (DRO) Motor Oil Range Organics (MRO)	SampT Batch Analysis D Result ND ND	Type: ME n ID: 45 Date: 6 PQL 10 50	3LK 307 4/2019 SPK value	Tes F S SPK Ref Val	tCode: EF RunNo: 66 SeqNo: 26 %REC	PA Method 0359 041754 LowLimit	8015M/D: Die Units: mg/K HighLimit	ésel Rango (g %RPD	e Organics	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 Limit

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QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#: **1905E09**

10-Jun-19

Client:	HILCORP ENERGY
Project:	Lambe 2C

Sample ID: 1905E09-001AMS	Samp	Гуре: М	6	Tes	tCode: El	PA Method	8015D: Gasc	oline Rang	e	
Client ID: GR03@28'	Batc	h ID: 45	298	F	RunNo: 6	0348				
Prep Date: 5/31/2019	Analysis I	Date: 6/	3/2019	S	SeqNo: 2	041015	Units: mg/H	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.8	23.76	0	85.1	69.1	142			
Surr: BFB	980		950.6		103	73.8	119			
Sample ID: 1905E09-001AMS	D Samp	Гуре: М	SD	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: GR03@28'	Batc	h ID: 45	298	F	RunNo: 6	0348				
Prep Date: 5/31/2019	Analysis [Date: 6/	3/2019	S	SeqNo: 2	041016	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.7	23.65	0	86.9	69.1	142	1.67	20	
Surr: BFB	980		946.1		103	73.8	119	0	0	
Sample ID: LCS-45298	Samp	Type: LC	S	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: LCSS	Batc	h ID: 45	298	F	RunNo: 6	0348				
Prep Date: 5/31/2019	Analysis [Date: 6/	3/2019	5	SeqNo: 2	041036	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.1	80.1	123			
Surr: BFB	1000		1000		102	73.8	119			
Sample ID: MB-45298	Samp	Type: ME	BLK	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: PBS	Batc	h ID: 45	298	F	RunNo: 6	0348				
Prep Date: 5/31/2019	Analysis [Date: 6/	3/2019	5	SeqNo: 2	041037	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
0 050	000		1000		00.0	72.0	110			

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 Limit

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QC SUMMARY Hall Environment	Y REP tal Anal	ORT ysis I	aborat	ory, Inc.					WO#:	1905E09 10-Jun-19
Client: HILCO	RP ENERG	θY								
Project: Lambe	2C									
Sample ID: 1905E09-002AM	IS Samp ⁻	Type: MS	3	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID: GR04@28'	Batc	h ID: 45	298	F	RunNo: 6	0348				
Prep Date: 5/31/2019	Analysis [Date: 6/	3/2019	S	SeqNo: 2	041048	Units: mg/h	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.023	0.9363	0.04481	82.5	63.9	127			
Toluene	3.1	0.047	0.9363	2.450	69.2	69.9	131			S
Ethylbenzene	3.3	0.047	0.9363	2.481	87.3	71	132			
Xylenes, Total	35	0.094	2.809	35.25	5.72	71.8	131			ES
Surr: 4-Bromofluorobenzene	3.6		0.9363		386	80	120			S
Sample ID: 1905E09-002AM	ISD Samp	Type: MS	SD	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID: GR04@28'	Batc	h ID: 45	298	F	RunNo: 6	0348				
Prep Date: 5/31/2019	Analysis [Date: 6/	3/2019	S	SeqNo: 2	041049	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.78	0.024	0.9699	0.04481	76.2	63.9	127	4.24	20	
Toluene	3.6	0.048	0.9699	2.450	120	69.9	131	15.4	20	
Ethylbenzene	3.8	0.048	0.9699	2.481	136	71	132	14.1	20	S
Xylenes, Total	41	0.097	2.910	35.25	182	71.8	131	13.5	20	ES
Surr: 4-Bromofluorobenzene	4.0		0.9699		412	80	120	0	0	S
	0		-		·					

Sample ID: LCS-45298	Sampl	ype: LC	S	TestCode: EPA Method 8021B: Volatiles						
Client ID: LCSS	Batc	h ID: 452	298	F	RunNo: 6					
Prep Date: 5/31/2019	Analysis Date: 6/3/2019			5	SeqNo: 2041067 Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	100	80	120			
Toluene	1.1	0.050	1.000	0	105	80	120			
Ethylbenzene	1.0	0.050	1.000	0	103	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		106	80	120			

Sample ID: MB-45298	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8021B: Volat	iles		
Client ID: PBS	Batch	n ID: 45	298	F	RunNo: 6	0348				
Prep Date: 5/31/2019	Analysis D	0ate: 6/	3/2019	S	SeqNo: 2	041068	Units: mg/K	g		
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	0.97		1.000		96.5	80	120			

Qualifiers:

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

- В Analyte detected in the associated Method Blank
- Value above quantitation range Е
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

HALL ENVIR ANALY LABOR	ONMENT SIS Atory	AL	Ha TE	ll Environme L: 505-345- Website: ww	ental Analy 49(Albuquerg 3975 FAX: ww.hallenvi	vsis Lab DI Haw que, NM 505-34 ronmen	oratory kins NE 187109 5-4107 tal.com	Sar	nple Log-In Check List	
Client Name:	HILCORP	ENERGY FA	R Work	Order Num	nber: 190	5E09			RcptNo: 1	-
Received By:	Anne Tho	orne	5/30/20	19 8:00:00	AM		a	me A.	~	
Completed By: Reviewed By:	Erin Mele Y65	ndrez 5130114	5/30/20	19 11:21:3	4 AM		U	MA		
Chain of Cust	ody									
1. Is Chain of Cu	stody comp	lete?			Yes	~	٢	10 🗌	Not Present	
2. How was the s	ample deliv	rered?			Cou	rier				
Log In 3. Was an attem	ot made to c	cool the samp	les?		Yes	~	N	lo 🗌		
4. Were all samp	les received	at a tempera	ature of >0° C	to 6.0°C	Yes		N	lo 🗌		
5. Sample(s) in p	roper contai	iner(s)?			Yes		N	lo 🗆		
6. Sufficient samp	ole volume f	or indicated to	est(s)?		Yes	~	N	o 🗌		
7. Are samples (e	xcept VOA	and ONG) pro	operly preserve	ed?	Yes	\checkmark	N	o 🗌		
8. Was preservati	ve added to	bottles?			Yes		Ν	•		
9. VOA vials have	zero heads	space?			Yes		N	o 🗌	No VOA Vials 🗹	
10. Were any sam	ple containe	ers received b	oroken?		Yes		N	lo 🗸	# of preserved	Thm
11. Does paperwor (Note discrepar	k match bot ncies on cha	tle labels? ain of custody)		Yes	~	Ν	o 🗌	bottles checked for pH: (<2 or >12 unless noted)	5-30-1
2. Are matrices co	prrectly ident	tified on Chai	n of Custody?		Yes	\checkmark	N	o 🗌	Adjusted?	
3. Is it clear what	analyses we	ere requested	?		Yes	\checkmark	N	o 🗌		
4. Were all holdin (If no, notify cu	g times able stomer for a	e to be met? uthorization.)			Yes	\checkmark	N	o 🗌	Checked by:	
Special Handli	ng (if app	licable)								
15. Was client not	fied of all di	screpancies	with this order?)	Yes		N	lo 🗌	NA 🔽	
Person N	lotified:			Date	e: [
By Whor	n:			Via:	eMa	ail 🗌	Phone [Fax	In Person	
Regardin	g: [
Client Ins	structions:									
16. Additional rem	arks:									
Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal D	ate	Signe	d By		
1	3.6	Good	Yes	oourno	oca De		orgine	u Dy		
2	2.6	Good	Yes							

Chain	-of-Cust	tody Record	Turn-Around	Time:					i						
Client: Hil	corp Energy (Company	X Standard		н			I ALI			A A			AL	
			Project Nam	e:				h.www	allenvi		antal.o				
Mailing Address			Lambe 2C			4901	Hawk	ns NE	- Ab	Janer	oue. N	M 87109			
			Project #:			Tel.	505-34	5-397	ш.	ax 5(5-345	4107			
Phone #:	505-324	1-5128							Analy	sis R	sanbe				
email or Fax#:	Ideal(@)	<u>ilcorp.com</u>	Project Mana	ger:		(C ()		-	Þ0	-	(tr				
QA/QC Package:			Hilcorp - Jen	nifer Deal		NR0	SC	SV	S "*		lesc				
D. Standard		Level 4 (Full Validatio	LTE - Danny	Burns		/ O 3) s,	22	VISC	Од		IA\Jr				
Accreditation:	D Az C	ompliance	Sampler:	D. Burns		8M	(1.	0228	105'		uəse				
D NELAC	D Othe		On Ice:	M'Yes	ON D	/ 03 L /	709	01 8	N '		(Pre				
DEDD (Type)	PDF		# of Coolers:	7		SBE	g po	ot	103) W.				
			Cooler Temp	(including CF): 3,4	+0.2 (F 53.4 °C		ous	58 \ 9M	r, 1	(AC	-inne				
Date Tin	ne Matrix	Sample Name	Container Type and #	ス.イ Preservative Type	HONSCF = 2.4° -	X 378 708:H97 708:H97	EDB (W	PAHs by 8 AROR	CI' E' BI	A) 0928	Total Co				
5/29/2019 10	0:30 Soil	GR03@28'	1-4 oz jar	cool	-001	×		 		2	-		+		T
5/29/2019 10	0:35 Soil	GR04@28'	1-4 oz jar	cool	-002	××		-		-	<u> </u>		-	1	T
5/29/2019 1/	0:40 Soil	GR05@28'	1-4 oz jar	cool	-003	××				-					Τ
5/29/2019 10	0:45 Soil	GR06@28	1-4 oz jar	cool	-NOU	××							$\left \right $		Ι
5/29/2019 1	1:10 Soil	GR07@23'	1-4 oz jar	cool	-005	x x									I
5/29/2019 1	1:15 Soil	GR08@25'	1-4 oz jar	cool	- DOLO	××									
5/29/2019 1	1:20 Soil	GR09@25'	1-4 oz jar	cool	-007	x x									Γ
5/29/2019 1	1:25 Soil	GR10@23'	1-4 oz jar	cool	-ND3	x x									
5/29/2019 1	1:30 Soil	FS01@29'	1-4 oz jar	cool	-00-	××									
								-		-					1
								_		-	_	1	-		T
Date: Time	Relinenish	ad hv	Paralvad hu	Vis.	Data Timo]		-			4		T
5-29-19 18.	00	P	/Jonet	Wall	5/29/17 1860	Kemarks:	5	purns(gitenv	COM					
S/29/15 181	Relinquist	hed by:	Received by:	Via:	Date Time, DS/30/19										
If necessary	, samples submitte	of to Hall Environmental may be subco	intracted to other a	ccredited laboratori	les. This serves as notice of this	possibility. Any	sub-cont	acted dat	a will be	dearly no	stated on	the analytical	report.		1



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

August 07, 2019

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

OrderNo.: 1907D51

RE: Lambe 2C

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 16 sample(s) on 7/26/2019 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

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Date Reported: 8/7/2019

CLIENT: Hilcorp Energy Project: Lambe 2C		Cl	ient Sample II Collection Dat): M e• 7/	W08 0'-5' 22/2019 12:00:00 PM	
Lab ID: 1907D51-001	Matrix: SOIL		Received Dat	e: 7/2	26/2019 8:00:00 AM	
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RAM	IGE ORGANICS				Analysi	t: TOM
Diesel Range Organics (DRO)	ND	9.3	mg/Kg	1	8/1/2019 9:11:49 AM	46522
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	8/1/2019 9:11:49 AM	46522
Surr: DNOP	88.2	70-130	%Rec	1	8/1/2019 9:11:49 AM	46522
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst	t: RAA
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	8/1/2019 6:27:52 PM	46521
Surr: BFB	97.4	73.8-119	%Rec	1	8/1/2019 6:27:52 PM	46521
EPA METHOD 8021B: VOLATILES					Analyst	t: RAA
Benzene	ND	0.025	mg/Kg	1	8/1/2019 6:27:52 PM	46521
Toluene	ND	0.050	mg/Kg	1	8/1/2019 6:27:52 PM	46521
Ethylbenzene	ND	0.050	mg/Kg	1	8/1/2019 6:27:52 PM	46521
Xylenes, Total	ND	0.099	mg/Kg	1	8/1/2019 6:27:52 PM	46521
Surr: 4-Bromofluorobenzene	96.6	80-120	%Rec	1	8/1/2019 6:27:52 PM	46521

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 MatrixH 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

Hall Environmental Analysis Laboratory, Inc.

- 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 Limit

Page 1 of 20

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Project:	Hilcorp Energy Lambe 2C		Cl	ient Sample II Collection Dat	D: M e: 7/	W08 30'-35' 22/2019 1:00:00 PM	
Lab ID:	1907D51-002	Matrix: SOIL		Received Dat	e: 7/2	26/2019 8:00:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	HOD 8015M/D: DIESEL RANGE	ORGANICS				Analys	t: TOM
Diesel R	ange Organics (DRO)	ND	9.4	mg/Kg	1	8/1/2019 3:50:56 PM	46522
Motor Oi	I Range Organics (MRO)	ND	47	mg/Kg	1	8/1/2019 3:50:56 PM	46522
Surr: [DNOP	81.6	70-130	%Rec	1	8/1/2019 3:50:56 PM	46522
EPA MET	HOD 8015D: GASOLINE RANGI	E				Analys	t: RAA
Gasoline	Range Organics (GRO)	ND	4.9	mg/Kg	1	8/1/2019 7:39:01 PM	46521
Surr: E	3FB	97.5	73.8-119	%Rec	1	8/1/2019 7:39:01 PM	46521
EPA MET	HOD 8021B: VOLATILES					Analys	t: RAA
Benzene		ND	0.024	mg/Kg	1	8/1/2019 7:39:01 PM	46521
Toluene		ND	0.049	mg/Kg	1	8/1/2019 7:39:01 PM	46521
Ethylben	zene	ND	0.049	mg/Kg	1	8/1/2019 7:39:01 PM	46521
Xylenes,	Total	ND	0.097	mg/Kg	1	8/1/2019 7:39:01 PM	46521
Surr: 4	4-Bromofluorobenzene	97.1	80-120	%Rec	1	8/1/2019 7:39:01 PM	46521

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

- 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 Limit

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S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT:	Hilcorp Energy		Cl	ient Sample II	D: M	W06 30'-35'	
Project:	Lambe 2C		(Collection Dat	e: 7/2	23/2019 9:00:00 AM	
Lab ID:	1907D51-003	Matrix: SOIL		Received Dat	e: 7/2	26/2019 8:00:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	HOD 8015M/D: DIESEL RANGE	ORGANICS				Analys	t: BRM
Diesel R	ange Organics (DRO)	ND	10	mg/Kg	1	8/5/2019 9:25:24 AM	46522
Motor Oi	I Range Organics (MRO)	ND	50	mg/Kg	1	8/5/2019 9:25:24 AM	46522
Surr: [ONOP	95.1	70-130	%Rec	1	8/5/2019 9:25:24 AM	46522
ΕΡΑ ΜΕΤ	HOD 8015D: GASOLINE RANGE					Analys	t: RAA
Gasoline	Range Organics (GRO)	ND	4.9	mg/Kg	1	8/1/2019 8:50:14 PM	46521
Surr: E	3FB	95.6	73.8-119	%Rec	1	8/1/2019 8:50:14 PM	46521
EPA MET	HOD 8021B: VOLATILES					Analys	t: RAA
Benzene		ND	0.025	mg/Kg	1	8/1/2019 8:50:14 PM	46521
Toluene		ND	0.049	mg/Kg	1	8/1/2019 8:50:14 PM	46521
Ethylben	zene	ND	0.049	mg/Kg	1	8/1/2019 8:50:14 PM	46521
Xylenes,	Total	ND	0.099	mg/Kg	1	8/1/2019 8:50:14 PM	46521
Surr: 4	4-Bromofluorobenzene	96.5	80-120	%Rec	1	8/1/2019 8:50:14 PM	46521

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 Limit

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Hall Environmental Analysis Laboratory, Inc. Date Reported: 8/7/2019

CLIENT:	Hilcorp Energy		Cl	ient Sample II): M	W06 20'-25'	
Project:	Lambe 2C			Collection Dat	e: 7/2	23/2019 8:15:00 AM	
Lab ID:	1907D51-004	Matrix: SOIL		Received Dat	e: 7/2	26/2019 8:00:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	THOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst	: ТОМ
Diesel R	ange Organics (DRO)	ND	10	mg/Kg	1	8/1/2019 4:35:29 PM	46522
Motor Oi	il Range Organics (MRO)	ND	50	mg/Kg	1	8/1/2019 4:35:29 PM	46522
Surr: I	DNOP	74.0	70-130	%Rec	1	8/1/2019 4:35:29 PM	46522
EPA MET	THOD 8015D: GASOLINE RANG	E				Analyst	RAA
Gasoline	e Range Organics (GRO)	ND	4.9	mg/Kg	1	8/1/2019 9:13:51 PM	46521
Surr: I	BFB	97.8	73.8-119	%Rec	1	8/1/2019 9:13:51 PM	46521
EPA MET	THOD 8021B: VOLATILES					Analyst	RAA
Benzene	9	ND	0.025	mg/Kg	1	8/1/2019 9:13:51 PM	46521
Toluene		ND	0.049	mg/Kg	1	8/1/2019 9:13:51 PM	46521
Ethylben	izene	ND	0.049	mg/Kg	1	8/1/2019 9:13:51 PM	46521
Xylenes,	Total	ND	0.098	mg/Kg	1	8/1/2019 9:13:51 PM	46521
Surr: 4	4-Bromofluorobenzene	97.4	80-120	%Rec	1	8/1/2019 9:13:51 PM	46521

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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT:	Hilcorp Energy		C	ient Sample II	D: M	W02 20'-25'	
Project:	Lambe 2C		(Collection Dat	e: 7/	23/2019 2:00:00 PM	
Lab ID:	1907D51-005	Matrix: SOIL		Received Dat	e: 7/	26/2019 8:00:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	HOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst	: TOM
Diesel Ra	ange Organics (DRO)	ND	9.5	mg/Kg	1	8/1/2019 4:57:52 PM	46522
Motor Oil	Range Organics (MRO)	ND	48	mg/Kg	1	8/1/2019 4:57:52 PM	46522
Surr: D	DNOP	84.9	70-130	%Rec	1	8/1/2019 4:57:52 PM	46522
EPA MET	HOD 8015D: GASOLINE RANGE	E				Analyst	RAA
Gasoline	Range Organics (GRO)	ND	5.0	mg/Kg	1	8/1/2019 9:37:27 PM	46521
Surr: E	3FB	94.6	73.8-119	%Rec	1	8/1/2019 9:37:27 PM	46521
EPA MET	HOD 8021B: VOLATILES					Analyst	: RAA
Benzene		ND	0.025	mg/Kg	1	8/1/2019 9:37:27 PM	46521
Toluene		ND	0.050	mg/Kg	1	8/1/2019 9:37:27 PM	46521
Ethylben	zene	ND	0.050	mg/Kg	1	8/1/2019 9:37:27 PM	46521
Xylenes,	Total	ND	0.10	mg/Kg	1	8/1/2019 9:37:27 PM	46521
Surr: 4	I-Bromofluorobenzene	94.3	80-120	%Rec	1	8/1/2019 9:37:27 PM	46521

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

- 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 Limit

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S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Project:	Hilcorp Energy		C	ient Sample II Collection Dat	D: M	W02 30'-35' 23/2019 3:00:00 PM	
Lab ID:	1907D51-006	Matrix: SOIL		Received Dat	e: 7/2	26/2019 8:00:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	HOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst	том
Diesel R	ange Organics (DRO)	ND	9.6	mg/Kg	1	8/1/2019 5:20:12 PM	46522
Motor Oi	I Range Organics (MRO)	ND	48	mg/Kg	1	8/1/2019 5:20:12 PM	46522
Surr: [DNOP	77.0	70-130	%Rec	1	8/1/2019 5:20:12 PM	46522
EPA MET	HOD 8015D: GASOLINE RANGE	E				Analyst	RAA
Gasoline	Range Organics (GRO)	ND	4.9	mg/Kg	1	8/1/2019 10:01:01 PM	46521
Surr: E	3FB	97.0	73.8-119	%Rec	1	8/1/2019 10:01:01 PM	46521
EPA MET	HOD 8021B: VOLATILES					Analyst	RAA
Benzene		ND	0.025	mg/Kg	1	8/1/2019 10:01:01 PM	46521
Toluene		ND	0.049	mg/Kg	1	8/1/2019 10:01:01 PM	46521
Ethylben	zene	ND	0.049	mg/Kg	1	8/1/2019 10:01:01 PM	46521
Xylenes,	Total	ND	0.098	mg/Kg	1	8/1/2019 10:01:01 PM	46521
Surr: 4	4-Bromofluorobenzene	97.0	80-120	%Rec	1	8/1/2019 10:01:01 PM	46521

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

- 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 Limit

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S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Hilcorp Energy		Cl	ient Sample II	D: M	W03 20'-25'	
Project: Lambe 2C		(Collection Dat	e: 7/	23/2019 4:20:00 PM	
Lab ID: 1907D51-007	Matrix: SOIL		Received Dat	e: 7/	26/2019 8:00:00 AM	
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANG	GE ORGANICS				Analyst	: ТОМ
Diesel Range Organics (DRO)	ND	9.4	mg/Kg	1	8/1/2019 5:43:01 PM	46522
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	8/1/2019 5:43:01 PM	46522
Surr: DNOP	73.5	70-130	%Rec	1	8/1/2019 5:43:01 PM	46522
EPA METHOD 8015D: GASOLINE RAN	IGE				Analyst	RAA
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	8/1/2019 10:24:41 PM	46521
Surr: BFB	94.7	73.8-119	%Rec	1	8/1/2019 10:24:41 PM	46521
EPA METHOD 8021B: VOLATILES					Analyst	RAA
Benzene	ND	0.025	mg/Kg	1	8/1/2019 10:24:41 PM	46521
Toluene	ND	0.050	mg/Kg	1	8/1/2019 10:24:41 PM	46521
Ethylbenzene	ND	0.050	mg/Kg	1	8/1/2019 10:24:41 PM	46521
Xylenes, Total	ND	0.10	mg/Kg	1	8/1/2019 10:24:41 PM	46521
Surr: 4-Bromofluorobenzene	95.4	80-120	%Rec	1	8/1/2019 10:24:41 PM	46521

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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Project:	Hilcorp Energy		Cl	ient Sample II	D: M	W03 30'-35' 23/2019 5:00:00 PM	
Lab ID:	1907D51-008	Matrix: SOIL	,	Received Dat	e: 7/2	26/2019 8:00:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	HOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst	том
Diesel R	ange Organics (DRO)	ND	10	mg/Kg	1	8/1/2019 6:05:32 PM	46522
Motor Oi	I Range Organics (MRO)	ND	51	mg/Kg	1	8/1/2019 6:05:32 PM	46522
Surr: [ONOP	80.2	70-130	%Rec	1	8/1/2019 6:05:32 PM	46522
EPA MET	HOD 8015D: GASOLINE RANG	GE				Analyst	RAA
Gasoline	Range Organics (GRO)	ND	5.0	mg/Kg	1	8/1/2019 10:48:14 PM	46521
Surr: E	3FB	94.4	73.8-119	%Rec	1	8/1/2019 10:48:14 PM	46521
EPA MET	HOD 8021B: VOLATILES					Analyst	RAA
Benzene	1	ND	0.025	mg/Kg	1	8/1/2019 10:48:14 PM	46521
Toluene		ND	0.050	mg/Kg	1	8/1/2019 10:48:14 PM	46521
Ethylben	zene	ND	0.050	mg/Kg	1	8/1/2019 10:48:14 PM	46521
Xylenes,	Total	ND	0.099	mg/Kg	1	8/1/2019 10:48:14 PM	46521
Surr: 4	4-Bromofluorobenzene	94.9	80-120	%Rec	1	8/1/2019 10:48:14 PM	46521

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

- 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 Limit

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S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT:	Hilcorp Energy		C	ient Sample II	D: M	W04 20'-25'	
Project:	Lambe 2C		(Collection Dat	e: 7/2	24/2019 3:50:00 PM	
Lab ID:	1907D51-009	Matrix: SOIL		Received Dat	e: 7/2	26/2019 8:00:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	HOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst	том
Diesel R	ange Organics (DRO)	ND	10	mg/Kg	1	8/1/2019 6:28:12 PM	46522
Motor Oi	I Range Organics (MRO)	ND	52	mg/Kg	1	8/1/2019 6:28:12 PM	46522
Surr: [ONOP	80.6	70-130	%Rec	1	8/1/2019 6:28:12 PM	46522
EPA MET	HOD 8015D: GASOLINE RANGE	E				Analyst	RAA
Gasoline	Range Organics (GRO)	ND	5.0	mg/Kg	1	8/1/2019 11:11:46 PM	46521
Surr: E	3FB	97.9	73.8-119	%Rec	1	8/1/2019 11:11:46 PM	46521
EPA MET	HOD 8021B: VOLATILES					Analyst	RAA
Benzene		ND	0.025	mg/Kg	1	8/1/2019 11:11:46 PM	46521
Toluene		ND	0.050	mg/Kg	1	8/1/2019 11:11:46 PM	46521
Ethylben	zene	ND	0.050	mg/Kg	1	8/1/2019 11:11:46 PM	46521
Xylenes,	Total	ND	0.10	mg/Kg	1	8/1/2019 11:11:46 PM	46521
Surr: 4	1-Bromofluorobenzene	98.6	80-120	%Rec	1	8/1/2019 11:11:46 PM	46521

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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Hilcorp Energy	Client Sample ID: MW04 30'-35'									
Project: Lambe 2C		(Collection Dat	e: 7/	24/2019 4:30:00 PM					
Lab ID: 1907D51-010	Matrix: SOIL		Received Date: 7/26/2019 8:00:00 AM							
Analyses	Result	RL	DF	Batch						
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst	: ТОМ				
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	8/1/2019 6:50:42 PM	46522				
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	8/1/2019 6:50:42 PM	46522				
Surr: DNOP	87.5	70-130	%Rec	1	8/1/2019 6:50:42 PM	46522				
EPA METHOD 8015D: GASOLINE RAM	NGE				Analyst	RAA				
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	8/1/2019 11:35:22 PM	46521				
Surr: BFB	95.6	73.8-119	%Rec	1	8/1/2019 11:35:22 PM	46521				
EPA METHOD 8021B: VOLATILES					Analyst	RAA				
Benzene	ND	0.025	mg/Kg	1	8/1/2019 11:35:22 PM	46521				
Toluene	ND	0.050	mg/Kg	1	8/1/2019 11:35:22 PM	46521				
Ethylbenzene	ND	0.050	mg/Kg	1	8/1/2019 11:35:22 PM	46521				
Xylenes, Total	ND	0.10	mg/Kg	1	8/1/2019 11:35:22 PM	46521				
Surr: 4-Bromofluorobenzene	95.1	80-120	%Rec	1	8/1/2019 11:35:22 PM	46521				

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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT:	Hilcorp Energy	Client Sample ID: MW05 15'-20'										
Project:	Lambe 2C		(Collection Dat	e: 7/2	24/2019 9:40:00 AM						
Lab ID:	1907D51-011	Matrix: SOIL	Received Date: 7/26/2019 8:00:00 AM									
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch					
EPA MET	THOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst	том					
Diesel R	ange Organics (DRO)	ND	10	mg/Kg	1	8/1/2019 7:13:23 PM	46522					
Motor Oi	l Range Organics (MRO)	ND	51	mg/Kg	1	8/1/2019 7:13:23 PM	46522					
Surr: I	DNOP	80.1	70-130	%Rec	1	8/1/2019 7:13:23 PM	46522					
EPA MET	THOD 8015D: GASOLINE RA	NGE				Analyst	RAA					
Gasoline	Range Organics (GRO)	ND	4.9	mg/Kg	1	8/2/2019 10:38:48 AM	46521					
Surr: I	BFB	103	73.8-119	%Rec	1	8/2/2019 10:38:48 AM	46521					
EPA MET	THOD 8021B: VOLATILES					Analyst	RAA					
Benzene)	ND	0.024	mg/Kg	1	8/2/2019 10:38:48 AM	46521					
Toluene		ND	0.049	mg/Kg	1	8/2/2019 10:38:48 AM	46521					
Ethylben	izene	ND	0.049	mg/Kg	1	8/2/2019 10:38:48 AM	46521					
Xylenes,	Total	ND	0.098	mg/Kg	1	8/2/2019 10:38:48 AM	46521					
Surr: 4	4-Bromofluorobenzene	106	80-120	%Rec	1	8/2/2019 10:38:48 AM	46521					

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 Limit

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Date Reported: 8/7/2019

CLIENT:	W05 30'-35'										
Project:	Lambe 2C		(Collection Dat	e: 7/2	24/2019 11:00:00 AM					
Lab ID:	1907D51-012	Matrix: SOIL Received Date: 7/26/2019 8:00:00 AM									
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch				
EPA MET	HOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst	том				
Diesel Ra	ange Organics (DRO)	ND	10	mg/Kg	1	8/1/2019 7:35:47 PM	46522				
Motor Oil	Range Organics (MRO)	ND	52	mg/Kg	1	8/1/2019 7:35:47 PM	46522				
Surr: D	NOP	76.8	70-130	%Rec	1	8/1/2019 7:35:47 PM	46522				
EPA MET	HOD 8015D: GASOLINE RANG	GE				Analyst	RAA				
Gasoline	Range Organics (GRO)	ND	4.9	mg/Kg	1	8/2/2019 11:02:19 AM	46521				
Surr: B	FB	102	73.8-119	%Rec	1	8/2/2019 11:02:19 AM	46521				
EPA MET	HOD 8021B: VOLATILES					Analyst	RAA				
Benzene		ND	0.025	mg/Kg	1	8/2/2019 11:02:19 AM	46521				
Toluene		ND	0.049	mg/Kg	1	8/2/2019 11:02:19 AM	46521				
Ethylbenz	zene	ND	0.049	mg/Kg	1	8/2/2019 11:02:19 AM	46521				
Xylenes,	Total	ND	0.099	mg/Kg	1	8/2/2019 11:02:19 AM	46521				
Surr: 4	-Bromofluorobenzene	104	80-120	%Rec	1	8/2/2019 11:02:19 AM	46521				

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

Hall Environmental Analysis Laboratory, Inc.

- 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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Hilcorp Energy Client Sample ID: MW01 25'-30'											
Project:	Lambe 2C		(Collec	tion Dat	e: 7/2	24/2019 1:30:00 PM				
Lab ID:	1907D51-013	Matrix: SOIL		Received Date: 7/26/2019 8:00:00 AM							
Analyses		Result	RL	Qual	Units	DF	Date Analyzed	Batch			
EPA MET	THOD 8015M/D: DIESEL RAN	GE ORGANICS					Analyst	том			
Diesel R	ange Organics (DRO)	60	10		mg/Kg	1	8/3/2019 10:57:45 AM	46522			
Motor Oi	l Range Organics (MRO)	ND	50		mg/Kg	1	8/3/2019 10:57:45 AM	46522			
Surr: I	DNOP	91.2	70-130		%Rec	1	8/3/2019 10:57:45 AM	46522			
EPA MET	HOD 8015D: GASOLINE RA	NGE					Analyst	RAA			
Gasoline	e Range Organics (GRO)	120	25		mg/Kg	5	8/2/2019 3:45:32 PM	46521			
Surr: I	BFB	263	73.8-119	S	%Rec	5	8/2/2019 3:45:32 PM	46521			
EPA MET	THOD 8021B: VOLATILES						Analyst	RAA			
Benzene		ND	0.12		mg/Kg	5	8/2/2019 3:45:32 PM	46521			
Toluene		0.36	0.25		mg/Kg	5	8/2/2019 3:45:32 PM	46521			
Ethylben	izene	0.56	0.25		mg/Kg	5	8/2/2019 3:45:32 PM	46521			
Xylenes,	Total	6.2	0.50		mg/Kg	5	8/2/2019 3:45:32 PM	46521			
Surr: 4	4-Bromofluorobenzene	105	80-120		%Rec	5	8/2/2019 3:45:32 PM	46521			

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

- 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 Limit

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S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Hilcorp Energy Client Sample ID: MW01 30'-35'									
Project:	Lambe 2C		(Collection Dat	e: //	24/2019 2:00:00 PM			
Lab ID:	1907D51-014	Matrix: SOIL Received Date: 7/26/2019 8:00:00 AM							
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch		
EPA MET	HOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst	том		
Diesel Ra	ange Organics (DRO)	ND	9.5	mg/Kg	1	8/1/2019 8:20:28 PM	46522		
Motor Oi	I Range Organics (MRO)	ND	48	mg/Kg	1	8/1/2019 8:20:28 PM	46522		
Surr: [DNOP	77.4	70-130	%Rec	1	8/1/2019 8:20:28 PM	46522		
EPA MET	HOD 8015D: GASOLINE RANGE					Analyst	RAA		
Gasoline	Range Organics (GRO)	ND	5.0	mg/Kg	1	8/2/2019 11:49:24 AM	46521		
Surr: E	3FB	92.0	73.8-119	%Rec	1	8/2/2019 11:49:24 AM	46521		
EPA MET	HOD 8021B: VOLATILES					Analyst	RAA		
Benzene		ND	0.025	mg/Kg	1	8/2/2019 11:49:24 AM	46521		
Toluene		ND	0.050	mg/Kg	1	8/2/2019 11:49:24 AM	46521		
Ethylben	zene	ND	0.050	mg/Kg	1	8/2/2019 11:49:24 AM	46521		
Xylenes,	Total	ND	0.10	mg/Kg	1	8/2/2019 11:49:24 AM	46521		
Surr: 4	1-Bromofluorobenzene	93.0	80-120	%Rec	1	8/2/2019 11:49:24 AM	46521		

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 Limit

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Date Reported: 8/7/2019

CLIENT: Hilcorp Energy	W07 25'-30'											
Project: Lambe 2C		Collection Date: 7/23/2019 10:30:00 AM										
Lab ID: 1907D51-015	Matrix: SOIL		Received Dat	e: 7/2	26/2019 8:00:00 AM							
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch						
EPA METHOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst	том						
Diesel Range Organics (DRO)	ND	10	mg/Kg	1	8/3/2019 11:22:17 AM	46522						
Motor Oil Range Organics (MRO)	ND	52	mg/Kg	1	8/3/2019 11:22:17 AM	46522						
Surr: DNOP	93.4	70-130	%Rec	1	8/3/2019 11:22:17 AM	46522						
EPA METHOD 8015D: GASOLINE R	ANGE				Analyst	RAA						
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	8/2/2019 12:12:55 PM	46521						
Surr: BFB	99.2	73.8-119	%Rec	1	8/2/2019 12:12:55 PM	46521						
EPA METHOD 8021B: VOLATILES					Analyst	RAA						
Benzene	ND	0.025	mg/Kg	1	8/2/2019 12:12:55 PM	46521						
Toluene	ND	0.050	mg/Kg	1	8/2/2019 12:12:55 PM	46521						
Ethylbenzene	ND	0.050	mg/Kg	1	8/2/2019 12:12:55 PM	46521						
Xylenes, Total	ND	0.099	mg/Kg	1	8/2/2019 12:12:55 PM	46521						
Surr: 4-Bromofluorobenzene	94.5	80-120	%Rec	1	8/2/2019 12:12:55 PM	46521						

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 MatrixH 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

Hall Environmental Analysis Laboratory, Inc.

- 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 Limit

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Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/7/2019

CLIENT: Hilcorp Energy		Client Sample ID: MW07 30'-35'										
Project: Lambe 2C		(Collection Dat	e: 7/2	23/2019 11:00:00 AM							
Lab ID: 1907D51-016	Matrix: SOIL	Received Date: 7/26/2019 8:00:00 AM										
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch						
EPA METHOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst	том						
Diesel Range Organics (DRO)	ND	9.9	mg/Kg	1	8/1/2019 9:05:11 PM	46522						
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	8/1/2019 9:05:11 PM	46522						
Surr: DNOP	83.0	70-130	%Rec	1	8/1/2019 9:05:11 PM	46522						
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst	RAA						
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	8/2/2019 12:36:27 PM	46521						
Surr: BFB	93.1	73.8-119	%Rec	1	8/2/2019 12:36:27 PM	46521						
EPA METHOD 8021B: VOLATILES					Analyst	RAA						
Benzene	ND	0.025	mg/Kg	1	8/2/2019 12:36:27 PM	46521						
Toluene	ND	0.050	mg/Kg	1	8/2/2019 12:36:27 PM	46521						
Ethylbenzene	ND	0.050	mg/Kg	1	8/2/2019 12:36:27 PM	46521						
Xylenes, Total	ND	0.10	mg/Kg	1	8/2/2019 12:36:27 PM	46521						
Surr: 4-Bromofluorobenzene	94.0	80-120	%Rec	1	8/2/2019 12:36:27 PM	46521						

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

- 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 Limit

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S % Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

07-Aug-19

Client: Project:	Hilcorp E Lambe 20	Cinergy									
Sample ID:	LCS-46522	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	LCSS	Batch	n ID: 46	522	F	RunNo: 6	1831				
Prep Date:	7/31/2019	Analysis D	ate: 8/	/1/2019	S	SeqNo: 2	096112	Units: mg/K	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Surr: DNOP	Organics (DRO)	50 4.9	10	50.00 5.000	0	100 97.3	63.9 70	124 130			
Sample ID:	MB-46522	SampT	ype: MI	BLK	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	PBS	Batch	n ID: 46	522	F	RunNo: 6	1831				
Prep Date:	7/31/2019	Analysis D	ate: 8/	/1/2019	5	SeqNo: 2	096114	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range	Organics (DRO)	ND	10								
Motor Oil Rang	ge Organics (MRO)	ND 10	50	10.00		102	70	120			
Suit. DNOF		10		10.00		102	70	150			
Sample ID:	1907D51-001AMS	SampT	ype: MS	6	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	MW08 0'-5'	Batch	n ID: 46	522	F	RunNo: 6	1831				
Prep Date:	7/31/2019	Analysis D	ate: 8/	1/2019	5	SeqNo: 2	096438	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range	Organics (DRO)	45	11	53.30	0	85.0	57	142			
Surr: DNOP		3.9		5.330		73.0	70	130			
Sample ID:	1907D51-001AMS	D SampT	ype: MS	SD	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	MW08 0'-5'	Batch	n ID: 46	522	F	RunNo: 6	1831				
Prep Date:	7/31/2019	Analysis D	ate: 8/	/1/2019	5	SeqNo: 2	096556	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range	Organics (DRO)	48	10	52.19	0	91.3	57	142	5.00	20	
Surr: DNOP		4.0		5.219		76.4	70	130	0	0	
Sample ID:	LCS-46535	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	LCSS	Batch	n ID: 46	535	F	RunNo: 6	1831				
Prep Date:	8/1/2019	Analysis D	ate: 8/	2/2019	S	SeqNo: 2	097809	Units: %Red	C		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		4.7		5.000		94.9	70	130			
Sample ID:	MB-46535	SampT	ype: MI	BLK	Tes	tCode: El	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	PBS	Batch	n ID: 46	535	F	RunNo: 6	1831				
Prep Date:	8/1/2019	Analysis D	ate: 8/	2/2019	S	SeqNo: 2	097811	Units: %Red	C		
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 Limit

Hilcorp Energy

WO#: **1907D51** 07-Aug-19

Project:	Lambe 2C								
Sample ID:	MB-46535	SampType:	MBLK	TestCode	: EPA Method	8015M/D: Dies	el Range	e Organics	
Client ID:	PBS	Batch ID:	46535	RunNo	: 61831				
Prep Date:	8/1/2019	Analysis Date:	8/2/2019	SeqNo	2097811	Units: %Rec			
Analyte		Result PC	QL SPK value	SPK Ref Val %R	EC LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		13	10.00	1	35 70	130			S
Sample ID:	LCS-46571	SampType:	LCS	TestCode	EPA Method	8015M/D: Dies	el Range	e Organics	
Client ID:	LCSS	Batch ID:	46571	RunNo	: 61865				
Prep Date:	8/2/2019	Analysis Date:	8/5/2019	SeqNo	2098678	Units: %Rec			
Analyte		Result PC	QL SPK value	SPK Ref Val %R	EC LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		4.5	5.000	8	9.1 70	130			
Sample ID:	MB-46571	SampType:	MBLK	TestCode	EPA Method	8015M/D: Dies	el Range	e Organics	
Client ID:	PBS	Batch ID:	46571	RunNo	61865				
Prep Date:	8/2/2019	Analysis Date:	8/5/2019	SeqNo	2098679	Units: %Rec			
Analyte		Result PC	QL SPK value	SPK Ref Val %R	EC LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		9.4	10.00	9	.3 70	130			

Qualifiers:

Client:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
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- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
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- 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 Limit

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Client: Project:	Hilcorp E Lambe 20	nergy									
	Lunice 20										
Sample ID:	1907D51-002AMS	SampT	ype: M \$	5	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	MW08 30'-35'	Batch	n ID: 46	521	F	RunNo: 6	1828				
Prep Date:	7/31/2019	Analysis D	0ate: 8/	1/2019	5	SeqNo: 2	096980	Units: mg/h	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	e Organics (GRO)	25	5.0	25.00	0	102	69.1	142			
Surr: BFB		1100		1000		108	73.8	119			
Sample ID:	1907D51-002AMSI) SampT	ype: M	SD	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	MW08 30'-35'	Batch	n ID: 46	521	F	RunNo: 6	1828				
Prep Date:	7/31/2019	Analysis D	ate: 8/	1/2019	S	SeqNo: 2	096981	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	e Organics (GRO)	25	4.9	24.73	0	102	69.1	142	1.13	20	
Surr: BFB		1100		989.1		109	73.8	119	0	0	
Sample ID:	LCS-46521	SampT	ype: LC	S	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	LCSS	Batch	n ID: 46	521	F	RunNo: 6	1828				
Prep Date:	7/31/2019	Analysis D	0ate: 8/	1/2019	5	SeqNo: 2	096990	Units: mg/ #	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	je Organics (GRO)	24	5.0	25.00	0	95.0	80.1	123			
Surr: BFB		1100		1000		110	73.8	119			
Sample ID:	MB-46521	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	PBS	Batch	n ID: 46	521	F	RunNo: 6	1828				
Prep Date:	7/31/2019	Analysis D	0ate: 8/	1/2019	S	SeqNo: 2	096991	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	e Organics (GRO)	ND	5.0								
Surr: BFB		990		1000		99.0	73.8	119			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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 Limit

Client:	Hilcorp E	Energy									
Project:	Lambe 20	2									
Sample ID:	1907D51-001AMS	SampT	- уре: М	6	TestCode: EPA Method 8021B: Volatiles						
Client ID:	MW08 0'-5'	Batch	n ID: 46	521	F	RunNo: 61828					
Prep Date:	7/31/2019	Analysis D	Date: 8/	1/2019	S	SeqNo: 2	097157	Units: mg/k	٤g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.99	0.025	0.9872	0	100	63.9	127			
Toluene		1.1	0.049	0.9872	0	107	69.9	131			
Ethylbenzene		1.1	0.049	0.9872	0	110	71	132			
Kylenes, Total		3.2	0.099	2.962	0	109	71.8	131			
Surr: 4-Brom	ofluorobenzene	0.98		0.9872		99.5	80	120			
Sample ID:	1907D51-001AMSI	D SampT	уре: М	SD.	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	MW08 0'-5'	Batch	n ID: 46	521	F	RunNo: 6	1828				
Prep Date:	7/31/2019	Analysis D	Date: 8/	1/2019	S	SeqNo: 2	097158	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		1.0	0.025	0.9843	0	102	63.9	127	1.60	20	
Foluene		1.1	0.049	0.9843	0	109	69.9	131	2.01	20	
Ethylbenzene		1.1	0.049	0.9843	0	112	71	132	1.93	20	
Xylenes, Total		3.3	0.098	2.953	0	112	71.8	131	2.09	20	
Surr: 4-Brom	ofluorobenzene	0.97		0.9843		98.6	80	120	0	0	
Sample ID:	LCS-46521	SampT	ype: LC	S	Tes	tCode: E	PA Method	8021B: Volat	tiles		
Client ID:	LCSS	Batch	h ID: 46	521	F	RunNo: 6	1828				
Prep Date:	7/31/2019	Analysis D	Date: 8/	1/2019	S	SeqNo: 2	097168	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.96	0.025	1.000	0	95.5	80	120			
Toluene		1.0	0.050	1.000	0	101	80	120			
Ethylbenzene		1.0	0.050	1.000	0	101	80	120			
Xylenes, Total		3.1	0.10	3.000	0	102	80	120			
Surr: 4-Brom	ofluorobenzene	1.0		1.000		99.6	80	120			
Sample ID:	MB-46521	SampT	ype: ME	BLK	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batch	n ID: 46	521	F	RunNo: 6	1828				
Prep Date:	7/31/2019	Analysis D	Date: 8/	1/2019	S	SeqNo: 2	097169	Units: mg/k	٤g		
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-Brom	ofluorobenzene	0.99		1.000		98.5	80	120			

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

Qualifiers:

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

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY	Hall Environmental Albi TEL: 505-345-3975 Website: www.ha	Analys 490 querqu FAX: illenvir	tis Laboratory 1 Hawkins NE ue, NM 87109 505-345-4107 onmental.com	S	am	ple Log-In (Check List
Client Name: HILCORP ENERGY	Work Order Number:	1907	D51			RcptNo	o: 1
Received By: Anne Thorne	7/26/2019 8:00:00 AM		4	Inne ,	Am	_	
Completed By: Erin Melendrez	7/26/2019 8:47:32 AM		N	N	4	-	
Reviewed By: DAD 7/30/19					0		
Chain of Custody							
1. Is Chain of Custody complete?		Yes		No		Not Present	
2. How was the sample delivered?		<u>Cour</u>	ier				
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 [
5. Sample(s) in proper container(s)?		Yes		No [
6. Sufficient sample volume for indicated test(s)?		Yes	✓ N	1 0 [
7. Are samples (except VOA and ONG) properly p	preserved?	Yes	V N	l o [
8. Was preservative added to bottles?		Yes		lo 🗸	•	NA 🗌	
9. VOA vials have zero headspace?		Yes		lo 🗌		No VOA Vials 🗹	>
10. Were any sample containers received broken?		Yes	1	No 🔽		# of preserved	
11.Does paperwork match bottle labels?		Yes	v N	lo 🗌]	bottles checked for pH:	
(Note discrepancies on chain of custody)				_	,	Adjusted 2	r >12 unless noted)
2. Are matrices correctly identified on Chain of Cu	stody?	Yes	✓ N			Adjusted?	
3. Is it clear what analyses were requested?		Yes				Chasked by	alistra 10
14. Were all holding times able to be met? (If no, notify customer for authorization.)		Yes	⊻ N	lo L			AD1/30/19
Special Handling (if applicable)							0
15. Was client notified of all discrepancies with this	s order?	Yes	1 I	No [NA 🗸	
Person Notified: Danny Russ	Date:	7/30	stig				
By Whom:	Via: 🕅	eMa	il X Phone	F	ax	In Person	
Regarding: Think sol	a participation of the second		44	<u> </u>			
Client Instructions: Add the	pres						
16. Additional remarks:							
17. Cooler Information							

 Cooler No
 Temp °C
 Condition
 Seal Intact
 Seal No
 Seal Date
 Signed By

 1
 1.6
 Good
 Yes
 Seal No
 Seal Date
 Signed By

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Chain-of-Custody Record	Client: Hilcorp	Jennifer Deal	Mailing Address:		Phone #: 505-334-5138	email or Fax#: Uplen/ @ hilcorp. Cnm	QA/QC Package:		Accreditation: Accred			Date Time Matrix Sample Name	7124 1336 501 MWOI 1326 25-30	7/24 1400 60il MWD1 1400 30-35	-123 400 Soul MWO7 1023 -201	7/23 1100 Soil MWB+ 30'-35'	i Le Runy Bu				 7/35 1/1 C Entri Control	Date: Time: Relinquished by:	If necessary, samples submitted to Hall Environmental may be subco

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