



DELINEATION REPORT AND REMEDIAL ALTERNATIVE EVALUATION

OH Randel #5, API #30-045-05964 San Juan County, New Mexico

NMOCD

FEB 0 1 2019

DISTRICT III January 31, 2019

Prepared for:

HILCORP ENERGY COMPANY 382 County Road 3100 Aztec, New Mexico 87410

Incident# nVF1602039091 Reviewed and Procssed 2/27/19

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Prepared by:

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

Smith, Cory, EMNRD

From:	Smith, Cory, EMNRD
Sent:	Wednesday, February 27, 2019 3:11 PM
То:	Clara Cardoza
Cc:	Ashley Ager; Matt Henderson; 'Devin Hencmann'
Subject:	RE: OH Randel #5 Delineation and Variance Request

Clara,

OCD has reviewed the Delineation and Variance Request for the OH Randel # 5 received on February 1, 2019. After Review the OCD has denied HilCorp variance request to leave the impacted material in place. The Primary concern is the impacted mass is very large and contains high levels of BTEX constituents which are soluble and highly mobile. The mass is deep enough that natural biodegradation will not be very effective and will take an extremely large amount of time due to the eventual anaerobic environment caused by biodegradation.

The delineation report and variance request will be scanned into the well file asap.

Please submit to the OCD no later than April 1, 2019 HilCorps proposed remediation plan to include time lines.

Cory Smith Environmental Specialist Oil Conservation Division Energy, Minerals, & Natural Resources 1000 Rio Brazos, Aztec, NM 87410 (505)334-6178 ext 115 cory.smith@state.nm.us

From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Thursday, January 31, 2019 1:45 PM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Cc: Ashley Ager <aager@ltenv.com>; Clara Cardoza <ccardoza@hilcorp.com>; Matt Henderson
<mhenderson@hilcorp.com>
Subject: [EXT] OH Randel #5 Delineation and Variance Request

Cory,

Please see the attached Delineation and Variance Request Report for the OH Randel#5.

Please let me know if you have any questions.

Thank you, Devin



DELINEATION REPORT AND REMEDIAL ALTERNATIVE EVALUATION

OH RANDEL #5 SAN JUAN COUNTY, NEW MEXICO

Project Number: 017818016

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Prepared by:

Devin Hencmann LTE Project Geologist January 31, 2019 Date

Dat

Ashley L. ager

Reviewed by:

Ashley Ager, M.S., P.G. LTE Senior Geologist January 31, 2019

Date



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1.0 INTRODUCTION

LT Environmental, Inc. (LTE), on behalf of Hilcorp Energy Company (Hilcorp), has prepared the following Delineation Report and Remedial Alternative Evaluation associated with subsurface petroleum hydrocarbon impacts encountered at the OH Randel #5 natural gas production well (Site). The report summarizes subsurface data collected during previous investigations and a final delineation event conducted in December 2018.

Evaluation of the subsurface was initiated following a release from an on-site production tank and was continued as additional impacts were discovered. Ultimately, impacts from three releases were identified, mapped, and characterized.

This report additionally documents LTE's evaluation of remedial alternatives based on the findings of the site characterization. The objectives of the remedial alternative evaluation are to evaluate the potential risks to human health and environmental receptors posed by the impacted soil and to propose remedial actions, as appropriate, to eliminate or mitigate potential exposure pathways. The subsurface investigations conducted to date have characterized the impact to soil and the potential migration pathways of the contaminants of concern (COCSs). The fate and exposure points of the impacts are discussed to select a remedial approach that will close the pathways for exposure to COCs at the Site and downgradient.





2.0 SITE HISTORY

The Site is located on Navajo tribal land approximately 2.65 miles west of United States Highway 550 in San Juan County, New Mexico, in Unit D of Section 10, Township 26 North and Range 11 West (Figure 1). On January 18, 2016, XTO Energy, Inc. (XTO), the former operator of the Site, discovered a frozen valve on a 100-barrel (bbl) production tank that resulted in approximately 27 bbls of condensate and 5.5 bbls of produced water draining on to the ground and infiltrating into the subsurface. The release was contained in the tank berm, however no liquids were recovered.

Multiple soil sampling events were conducted at the Site between January 2016 and September 2017, as described in the LTE *Summary Report and Delineation Work Plan* (2018 Summary Report), submitted to the New Mexico Oil Conservation Division (NMOCD) in September 2018. A total of 32 soil borings were advanced by hand auger and hollow-stem auger to depths varying from 4 feet to 82 feet below ground surface (bgs). Results from the subsurface investigations indicated observed impacts were attributed to three different releases: the recent production tank release (the Primary Source) and two separate historical releases (identified as Secondary and Tertiary in Section 4). Petroleum hydrocarbon impact resulting from the recent production tank release (Primary Source) was limited in extent. Soil impacted by the two identified historical releases were demonstrated to be larger in volume and deeper than the impact from the Primary Source.

2.1 ACTIVE REMEDIATION

Following identification of the initial recent soil impacts beneath the production tank and prior to the full discovery of the additional areas of impacted soil, XTO installed a soil vapor extraction (SVE) system to address shallow subsurface impacts. The SVE system targeted, and most likely successfully remediated, soil impacted by the releases from the production tank. SVE system installation details and operating results were provided in the 2018 Summary Report. The SVE system is currently active and air sampling results from 2018 suggest it has removed available petroleum hydrocarbons from the subsurface; however, confirmation soil sampling has not been conducted. Additional details of the SVE system are discussed in Section 5.0.

2.2 REGULATORY FRAMEWORK

The Primary Source release occurred prior to August 14, 2018, and XTO ranked the Site a zero pursuant to the NMOCD *1993 Guidelines for Remediation of Leaks, Spills and Releases* to determine applicable remediation action levels. The nearest permitted water well is 1.7 miles to the south with a depth to groundwater of 200 feet bgs. The nearest significant watercourse is a dry arroyo 756 feet north of the Site. Based on these observations, the remediation action levels applied to the Site were 10 milligrams per kilogram (mg/kg) benzene, 50 mg/kg total for the sum of benzene, toluene, ethylbenzene, and total xylenes (BTEX), and 5,000 mg/kg for total petroleum hydrocarbons (TPH).

Following the transfer of ownership of the Site from XTO to Hilcorp, the NMOCD, in an electronic message (email) dated August 28, 2018, requested that Hilcorp update the SVE operational data, conduct additional delineation, and provide a remediation work plan for the Site. The 2018 Summary Report provided the updated information and proposed additional delineation to be conducted in two phases: one phase to confirm remediation and full delineation of impacted shallow soil affected by the





production tank and a second phase using different drilling technologies to delineate the deeper and more extensive impacts east of the production tank. The NMOCD's response to the work plan proposal, as documented in an email dated October 22, 2018, required full delineation to be completed by January 22, 2019. The NMOCD specified that remediation should comply with Title 19, Chapter 15, Part 29, Section 12 (19.15.29.12) of the New Mexico Administrative Code (NMAC), but that delineation and remediation should proceed using previously established remediation standards.

LTE mobilized a sonic drill rig in December 2018 to reach the deeper subsurface intervals and focused on a full-site delineation of the known source areas. The delineation boreholes required the entirety of the available drilling schedule, and no confirmation samples were collected to evaluate remediation by the SVE system. The details of the final delineation event are provided in subsequent sections of this report and are used to fully characterize the identified releases as discussed in Section 4.0.





3.0 SITE SETTING

The Site is located on the Navajo Nation Reservation in the Bisti Region of the San Juan Basin, approximately 14 miles south-southwest of Bloomfield, New Mexico. The Site is at an elevation of approximately 6,422 feet above mean sea level with surface drainage northwest toward the San Juan River.

3.1 LAND AND WATER USE

The Site is situated in a high-desert environment that is largely undeveloped. What land use there is consists of natural gas development, rangeland, and cropland that is irrigated by the Navajo Indian Irrigation Project (NIIP) operated by the Navajo Agricultural Products Industry (NAPI). The nearest crop circle is approximately 1,267 feet south-southeast of the Site. The nearest residence is located approximately 2 miles south of the Site.

The nearest permitted water supply well (SJ01626) is a single-use domestic water well located approximately 1.7 miles south of the Site. The well is completed in a bedrock aquifer to a total depth of 255 feet bgs. Depth to groundwater in the water well is reported as 200 feet bgs. Additional permitted water wells south and southwest of the Site target deeper aquifers around 200 feet bgs and greater.

3.2 REGIONAL GEOLOGY AND HYDROLOGY

The area is regionally described as having a thin cover of eolian sands at the ground surface overlying the Nacimiento Formation, which outcrops to the north and west. The lower portion of the Nacimiento Formation is composed of interbedded black, carbonaceous mudstones and white, coarse-grained sandstones. The upper part is comprised of mudstone and sandstone. It is generally slope-forming, even within the sandstone units. Aquifers within the coarser and continuous sandstone bodies of the Nacimiento Formation are between 0 and 1,000 feet deep in the San Juan Basin. The 1,000-foot depth range for aquifers covers an area over 20 miles wide and the depth decreases toward the margin of the San Juan Basin. The Site is more centrally located, and the depth to the aquifer is expected to be closer to 200 feet to 500 feet bgs (Stone et al., 1983).

The Site is part of a large area of land farmed by the NAPI for growing a variety of crops, including corn, potatoes, alfalfa, and pinto beans. In 1960, the United States Congress authorized construction of the NIIP to provide a water delivery system from the Navajo Dam reservoir to 110,630 acres of irrigable land in the Bisti Region. The NAPI was created to manage and maintain the croplands and water delivery system. Irrigation water is released from the San Juan River at Navajo Dam through a diversion headworks and travels through a series of concrete- and membrane-lined open canals. Irrigation in the Bisti Region can produce shallow discontinuous perched aquifers; however, these aquifers are not defined in published literature, and shallow groundwater was not identified at the Site through soil borings as deep as 105 feet bgs.

Local stratigraphy at the Site consists of graded fill over approximately 50 feet of reddish-brown silty sand. A poorly sorted, semi-consolidated, coarse sand is present from approximately 50 feet to 85 feet bgs. Below the sand at approximately 85 feet bgs is a dark, grayish-black fat, highly plastic and





compacted clay. The lithologies are part of the Nacimiento Formation with weathered facies near the surface and more consolidated sands and clays occurring with depth.





4.0 SITE CHARACTERIZATION

Subsurface investigations were initiated following the release from the production tank and consisted of multiple soil sampling events occurring from January 2016 to September 2017 as additional impacts were discovered. Impacts to soil were observed in two areas: beneath the production tank and east of the production tank. Final delineation was conducted in December of 2018. A sonic drilling rig was utilized during the final delineation to complete boreholes to depths below observed impact, where a hollow-stem auger had previously met refusal. The previous delineation events were documented in the 2018 Summary Report. The final delineation event has not been documented; therefore, those findings are presented in detail below to complete the site characterization.

4.1 FINAL DELINEATION

Between December 13, 2018 and December 19, 2018, LTE utilized a sonic drilling rig to advance eight boreholes (BH-28 through BH-36) to total depths ranging from 32 feet to 105 feet bgs. Locations of the existing and new boreholes are presented on Figure 2. Samples were collected in a continuous sample barrel. As specified in the email dated October 22, 2018, from NMOCD approving the work plan proposed in the 2018 Summary Report, composite soil samples were collected from the first 10 feet bgs, and then every five feet thereafter. Samples from the continuous sample barrel were split and screened for volatile aromatic hydrocarbons using a photo-ionization detector (PID) equipped with a 10.6 electron volt lamp. Laboratory analysis was conducted on samples collected from the intervals with the highest field screening result and from the bottom of each borehole. In some cases, additional sample intervals were analyzed to better characterize soil impacts. For laboratory analysis, the remaining split soil sample was placed directly into pre-cleaned glass jars, labeled with location, date, time, sampler, and method of analysis and immediately placed on ice. The soil samples were shipped at 4 degrees Celsius (°C) under strict chain-of-custody procedures to Hall Environmental Analysis Laboratory (Hall) in Albuquergue, New Mexico, for analysis of BTEX by United States Environmental Protection Agency (USEPA) Method 8021B and TPH-gasoline range organics (GRO), TPH-diesel range organics (DRO), and TPH- oil range organics (ORO) by USEPA Method 8015M/D. Boring logs are included in Appendix A.

4.2 DELINEATION RESULTS

To present a full site characterization, the delineation results are summarized in this section. Laboratory analytical results indicated that soil samples from boreholes HA-1, BH-7, BH-9, BH-12, BH-13, BH-15, BH-16, BH-20, BH-21, BH-22, BH-27, BH-31, BH-33, and BH-34 exceeded the NMOCD remediation action level of 50 mg/kg for total BTEX; soil samples from boreholes BH-12, BH-20, BH-21, BH-31, BH-33, and BH-34 exceeded the NMOCD remediation action level of 10 mg/kg for benzene; and soil samples collected from boreholes BH-12, BH-13, BH-20, BH-21, BH-33, and BH-34 exceeded the NMOCD remediation action level of 10 mg/kg for benzene; and soil samples collected from boreholes BH-12, BH-13, BH-20, BH-21, BH-31, BH-33, and BH-34 exceeded the NMOCD remediation action level of 5,000 mg/kg for TPH. Laboratory analytical results for soil samples from remaining boreholes did not exceed NMOCD remediation action levels for TPH, BTEX, or benzene. The soil analytical results exceeding NMOCD remediation action levels are depicted on Figure 2 and as compared to the NMOCD remediation action levels are presented in Table 1. The laboratory analytical reports are attached in Appendix B.





4.3 DELINEATION FINDINGS

Results from the final delineation event confirmed conclusions posed in the 2018 Summary Report while completing lateral and vertical delineation at the Site. Three separate source areas were identified within two areas of the Site based on concentrations of COCs and geometry, or distribution, of the impacted soil. Higher concentrations of benzene and BTEX were observed in the eastern area of the Site compared to the western area under the production tank (Figure 3). Additionally, the presence of TPH exceeding the NMOCD remediation action levels in the eastern area suggests a separate source signature for the area identified herein as the Tertiary Source (Table 1).

Figures 4 and 5 represent cross sections derived from soil borings conducted during the previous investigations. The cross sections indicate there are two areas of impact that correlate to the signature geometry presented in Figure 3: one to the west and one to the east.

The western area is under the production tank and can be differentiated vertically and identified herein as the Primary Source and Secondary Source areas. Field screening results observed in borehole HA-1 exhibited a decreasing trend from the ground surface to 6 feet bgs and then an increasing trend from 8 feet to 20 feet bgs. Impacts observed in borehole HA-1 from the ground surface to approximately 6 feet bgs (the Primary Source area) are attributed to the production tank release discovered on January 18, 2016. Impact encountered from 8 feet to 20 feet bgs (the Secondary Source area) is attributed to a historical release likely related to the same production tank (Figure 4). Boreholes BH-15 and BH-16 were drilled in close proximity to HA-1; however, impacts encountered in BH-15 and BH-16 were not observed until 10 feet bgs. Soil samples collected in boreholes BH-14, BH-17, BH-18, BH-19, BH-28, and BH-29 serve as lateral delineation points for the Primary and Secondary source areas in the north, south, and east directions (Figure 2). Vertical delineation of the western area is achieved with clean soil samples collected from the bottoms of borehole BH-15 at 30 feet to 32 feet bgs and borehole BH-16 at 33 feet to 35 feet bgs.

The eastern impact is more extensive both laterally and vertically. Impact, defined by soil samples exceeding NMOCD remediation action levels, begins at approximately 15 feet bgs in the area near boreholes BH-7 and BH-21, then extends to approximately 85 feet bgs where a compacted clay layer was observed. Vertical delineation in the eastern area is achieved by soil samples collected from the bottom of boreholes BH-29, BH-31, BH-32, and BH-33. The clay continues to a depth of at least 105 feet bgs, the deepest soil sampling interval in BH-33. This clay serves a confining layer to soil impacts and restricts the vertical migration of petroleum hydrocarbons. No soil samples collected from the clay contained concentrations of COCs exceeding NMOCD remediation action levels. Lateral delineation in the eastern area is documented by clean soil samples collected from boreholes BH-23, BH-24, BH25, BH-32, BH35, and BH-36.

Data collected between the eastern and western areas, represented by boreholes HA-5, BH-5, and BH-31, suggest there is separation between soil impacts. Shallower impacts represented by elevated field screening results occurring at approximately 15 feet bgs were observed in boreholes HA-5 and BH-5, but no soil exceeding the NMOCD remediation action levels was encountered (Figure 4). Field screening results in borehole BH-31 indicated elevated field screening results occur deeper, at approximately 20 feet bgs, and this soil contains elevated concentrations of BTEX and TPH concentrations that are out of range with concentrations observed in the western area.









5.0 CONCEPTUAL SITE MODEL

To better understand the potential impact to environmental and public health receptors, LTE has developed a Conceptual Site Model (CSM) to evaluate the sources and exposure pathways. The CSM follows industry-accepted methods for assessing risk by identifying potential receptors, transport mechanisms, and exposure pathways.

5.1 SOURCES

Subsurface investigation results suggest petroleum hydrocarbons were released at the Site at least three times. Two releases appear to have occurred from the production tank. On January 18, 2016, a production tank released approximately 27 bbls of condensate and 5.5 bbls of produced water that drained onto the ground and infiltrated into the subsurface. The release was contained within the tank berm, but no liquids were recovered. This is considered the Primary Source. Directly beneath soil impacted by the Primary Source is another area of impacted soil, likely the result of a historical production tank release. The historical production tank release is the Secondary Source. The COCs from the Primary and Secondary sources are characterized by BTEX concentrations ranging from 63.4 mg/kg to 142.4 mg/kg. Although benzene and TPH concentrations were detected, no concentrations exceeded the NMOCD remediation action levels. The Primary Source resulted in soil impacts that are approximately 245 cubic yards in volume.

In 2016, LTE installed six SVE wells and a 1-horsepower blower at the Site to address areas impacted by the Primary and Secondary sources. The SVE system operated continuously from August 11, 2016, until April 19, 2017, with greater than 92 percent (%) run time. As documented in the 2018 Summary Report, the SVE system achieved an 80.2% reduction in total BTEX (2,421 micrograms per liter [μ g/L] to 480 μ g/L) and an 80.7% reduction in TPH (46,000 μ g/L to 8,900 μ g/L) in air emissions. As of August 17, 2018, it was estimated that 768 pounds of total BTEX and 14,243 pounds of TPH had been removed from the subsurface via SVE. Although final confirmation samples have not been collected, it is likely that the SVE system remediated the Primary and Secondary source areas.

The Tertiary Source is of an unknown source, but resulted in extensive impact. LTE has researched release notifications for the Site available on the NMOCD database, but no conclusive historical source is evident. Available aerial photographs offer no clues to the source origin. Based on the site history, it can be assumed the Tertiary Source area was impacted by petroleum hydrocarbons in production fluids. The COCs for the Tertiary Source area consist of benzene, BTEX (primarily xylenes), and TPH that exceed NMOCD remediation action levels. The highest concentration of benzene was 66.3 mg/kg; BTEX observed as high as 990 mg/kg; and TPH was detected at 12,114 mg/kg. The estimated volume of impacted soil is approximately 14,000 cubic yards. Vertical delineation of the impacts was achieved at a confining clay layer occurring at approximately 85 feet bgs.

5.2 TRANSPORT MECHANISMS

Contaminant transport mechanisms from petroleum hydrocarbon-impacted soil resulting from the three identified sources at the Site are:





- Volatilization to soil gas;
- Migration to groundwater; and
- Groundwater migration to surface water.

5.2.1 Volatilization and Enclosed-Space Accumulation

Petroleum hydrocarbons are volatile. Migration of *de minimis* concentrations of BTEX and TPH through the soil column may be occurring and the potential therefore exists for accumulation in enclosed spaces situated directly above the soil. BTEX values observed in the subsurface range from below the laboratory detection limit to 990 mg/kg. TPH concentrations at the Site range from below the laboratory detection limit to 12,114 mg/kg. Currently there are no inhabitable enclosed spaces or structures above the impacted soil areas at the Site, except for a meter house. The sources do not extend beyond the lateral extents of the Site. Future development of the Site to include enclosed spaces is limited by the existing natural gas production well pad and potential use of the surface for agriculture.

5.2.2 Leaching and Groundwater Transport

Based on soil boring investigations, the site lithology consists of sand intervals that transition to silty sands and then a highly plastic clay that was encountered at approximately 85 feet bgs. The petroleum hydrocarbon impacts identified in the Tertiary Source area investigation were observed in the vertical intervals of the sand, with the sand content decreasing with depth. The observed impacts, as represented by concentrations of BTEX and TPH, decrease in the deeper, finer, and silty intervals, then are absent within the underlying clay layer.

The vertical transport of the petroleum hydrocarbons through the sand has reached an asymptotic state and any further transport would be dependent on applying enough head or flowing pressure to overcome the existing adsorption of the petroleum hydrocarbons to the soil. This adsorption is stronger in finer soils, including clay, which has a higher surface area that is more likely to adsorb and retain the petroleum hydrocarbons. Finer soils also exhibit lower hydraulic conductivity values (typically clay hydraulic conductivity values range from 1×10^{-7} centimeters per second [cm/sec] to 1×10^{-9} cm/sec compared to a silty sand hydraulic conductivity value of 1×10^{-3} cm/sec to 1×10^{-5} cm/sec). The lower hydraulic conductivity will slow migration of impacts. If driving mechanisms still exist to transport the impacts, then the top layer of the clay would exhibit impact. Field observations and laboratory analytical results for soil samples collected within the clay layer indicated that petroleum hydrocarbons have not migrated past the first several inches of this clay layer. As petroleum hydrocarbons were not observed in the clays, it is apparent the soil above the clay has acted to slow any downward transport of impact. The absence of a driving mechanism combined with lower hydraulic conductivity soils observed at depth will result in retardation and prevention of movement of the petroleum hydrocarbons through the clay.

As the releases are no longer occurring, the only driving mechanism that could increase vertical transport would be water infiltration. With little rainfall historically recorded in San Juan County (approximately 10 inches per year), the potential of surface water infiltrating and transporting the petroleum hydrocarbon impacts is limited. The water would need to displace the petroleum from the grains of soil or adsorb the petroleum and continue downward vertical migration. If sufficient water infiltration occurred, the sandy interval would act to adsorb the additional petroleum hydrocarbons.





Based on local hydrology and nearby water wells discussed in Section 3.1, groundwater is estimated to be greater than 200 feet bgs. Vertical migration of impact would need to transport through the highly adsorptive clay interval that has been observed to be at least 20 feet thick. A pathway for the migration of impacts to reach the groundwater has not been identified.

5.3 EXPOSURE PATHWAYS AND RECEPTORS

As the current use of the Site and surrounding properties is rangeland, agriculture, and oil and gas development, the potential receptors on site would be employees and contractors. It is estimated that oil and gas operations would continue for approximately 30 years. Following oil and gas operations, it is likely that native vegetation would be restored, or the area would be used for rangeland or agriculture. Generally, a vegetative root zone of up to 3 feet bgs is assumed. Given the depth of the remaining impact (approximately 15 feet bgs), animal and plant exposure are unlikely. No plants are currently found at the Site due to vegetation controls that restrict growth within the boundaries of the Site. With no subsurface transport mechanism, it is highly unlikely that human exposure would occur offsite. The potential exposure pathways are evaluated for on-site receptors.

5.3.1 Outdoor Air – Inhalation Exposure Route

Volatilized hydrocarbons migrating through the soil column to ambient air are possible from the Primary Source area; however, this source has likely been remediated by SVE. Personnel could potentially contact soil containing petroleum hydrocarbons during excavation activities and presumably inhale VOCs should concentrations remain in place; however, safety precautions and mitigation techniques can be used to remove this potential threat. Due to the depth of the Secondary and Tertiary source areas, it is unlikely that volatized hydrocarbons would migrate through the soil column to the surface. The outdoor air exposure pathway is designated as "Incomplete" on the CSM for evaluated receptors.

5.3.2 Indoor Air – Inhalation Exposure Route

The indoor air exposure pathway applies only to site personnel. Currently there are no inhabitable enclosed spaces or structures above the sources, so indoor exposure is not occurring. A meter house is present on site, but the structure is not air tight. If an inhabitable structure (non-confined space) were to be installed at the Site, a potential exists for volatilized hydrocarbons to migrate through the soil column and enter the structure if the floor is not impermeable. For these reasons, the indoor air exposure pathway is designated as "Incomplete" on the CSM.

5.3.3 Groundwater – Direct and Incidental Contact and Ingestion

There are no water supply wells at the Site extracting groundwater for domestic or industrial purposes, and no water supply wells are located within one mile of the Site. The nearest permitted water well is SJ 01626, located approximately 1.7 miles south of the Site, with a depth to groundwater of 200 feet and a total depth of 255 feet bgs. Therefore, no exposure to on-site or off-site receptors is occurring. As discussed, petroleum hydrocarbon impacts do not exceed 85 feet bgs, and a highly plastic clay is present at depth to restrict future migration of COCs. Therefore; there are no current or future groundwater receptors. For these reasons, the groundwater ingestion pathway is designated as "Incomplete" on the CSM.





5.3.4 Surface Water – Direct Contact and Ingestion

The nearest continuously flowing surface water feature that would be recharged by groundwater appears to be the San Juan River located approximately 13 miles north of the Site. Due to the depth of impacts and depth to groundwater discussed previously, it is unlikely that groundwater could become impacted and flow to surface water.

The nearest significant watercourse is a dry arroyo located 754 feet away from the Site. The nearest surface water to the Site is a United States Fish and Wildlife National Wetland Inventory (UFWS NWI) mapped wetland located approximately 5 miles northwest of the Site and an irrigation canal located approximately 5.2 miles northwest of the Site (Figure 6). Due to depth of the Tertiary Source area, surface flow from the Site would not be impacted by these sources. For these reasons, the surface water direct contact and ingestion exposure pathway is designated as "Incomplete" on the CSM.

5.3.5 Conclusions

The CSM identifies no complete pathway for human or environmental exposure to the COCs. Subsequent sections will evaluate remedial alternatives.





6.0 REMEDIAL ALTERNATIVES EVALUATION

The Remedial Alternatives Evaluation (RAE) summarizes the methods considered for remediation of the petroleum hydrocarbon impacted soil identified at the Site. To support the selection of a remedy, remediation alternatives were evaluated based on site-specific conditions. The remedies are detailed below with comparative analysis based on threshold and balancing criteria, which include protection of human health and environment (HH&E), long- and short-term effectiveness, reduction of toxicity, implementability, and cost. These criteria are derived from the USEPA feasibility policy for analysis of remedial action alternatives and consists of analysis of the method under specific criteria including protection of health and environment; compliance; long- and short-term effectiveness; resultant toxicity, mobility, or volume reduction; implementability; and cost. A summary of the evaluation is included as Table 2.

Remediation activities have been conducted on site as discussed herein. An SVE system operated for approximately two years and removed an estimated 7 tons of TPH from the subsurface. The system targeted the Primary and Secondary source areas. The soil impacted by the Primary and Secondary sources may have been remediated to NMOCD remediation action levels, but confirmation soil samples have not been collected. For this evaluation, options are included to address the potential that SVE did not fully remediate the Primary and Secondary sources and additional remedial efforts are required to bring the identified sources at the Site into compliance. Additional soil samples will be collected prior to commencing remediation to determine if NMOCD remediation action levels have been met.

The alternatives selected for evaluation include:

- 1. Primary Source area removal with natural attenuation of Secondary and Tertiary source area;
- 2. SVE; and
- 3. Comprehensive excavation.

6.1 PRIMARY SOURCE AREA REMOVAL WITH NATURAL ATTENUATION OF SECONDARY AND TERTIARY SOURCES

This alternative consists of conducting confirmation sampling of the Primary and Secondary source areas remediated by SVE to determine if additional corrective actions are necessary. Should confirmation sampling indicate concentrations of COCs in the Primary and Secondary source areas are compliant with NMOCD remediation action levels, those releases will be closed and the Tertiary source area will be allowed to naturally attenuate.

Should sampling determine that SVE did not successfully remediate impacts from the Primary and Secondary source areas, remaining impacts will be removed from the Primary Source area. Assuming worst-case scenario, this alternative involves removing approximately 50 cubic yards of impacted soil from the 2016 release and leaving any residual subsurface contamination from the Secondary and Tertiary sources in place at depths of 15 feet to 85 feet bgs. COCs consist of BTEX and TPH. Contaminant concentrations range from 10.3 to 66.3 mg/kg for benzene, 57.2 to 990 mg/kg for BTEX, and 5,357 to 12,114 mg/kg for TPH, which exceed the NMOCD remediation action levels. However, the pathway analysis presented in the CSM above indicates that exposure pathways (direct contact with soil, air,





groundwater, and surface water) are currently incomplete because of the depth of contamination, the depth to groundwater, and the distance to surface water. In the future, the Site may be used for agriculture, but the depth of contamination would prevent impacted soil from being exposed at the surface, and pathways would remain incomplete.

6.1.1 Protection of HH&E

Based on the CSM and the size of the source area, removing residual soil exceeding NMOCD remediation action levels in the Primary Source area via excavation would be the most favorable option for eliminating the potential threat of shallow impacts affecting HH&E, assuming the Primary Source area has not been remediated by SVE. The location and depth of the Secondary and Tertiary source areas as discussed previously results in an incomplete pathway with no threat to HH&E.

Natural processes will degrade the Secondary and Tertiary source contaminants over time, resulting in a reduction of toxicity and volume over the long term. In the short term, HH&E will be protected due to the pathway remaining incomplete.

6.1.2 Compliance

Primary Source area removal would result in meeting residential screening levels in the shallow soil. Natural attenuation of the Secondary and Tertiary source areas would result in meeting residential screening levels in the future.

6.1.3 Long-term Effectiveness and Permanence

Through excavation of the Primary Source area, residual COCs would be removed from the Site permanently in that zone. Source removal can be demonstrated through documentation and laboratory analytical results of soil confirmation sampling. Excavation is the most favorable long-term effective and permanent solution of the three options. Natural attenuation of Secondary and Tertiary source areas would eventually result in degradation of COCs to acceptable levels.

6.1.4 Toxicity, Mobility, or Volume Reduction Through Treatment

Excavation would remove the contaminants and immediately reduce the toxicity, mobility, and volume of on-site contaminants; however, the toxicity and volume of contaminants would be transferred to a landfill and experience anaerobic conditions, which would be the slowest of all remedial processes. Secondary and Tertiary source contaminants are degraded *in situ* by biological processes that will reduce the petroleum hydrocarbons to carbon dioxide and water. The process takes time to reduce the toxicity, mobility, and volume. As it is a non-active remediation strategy that requires time, the option has intermediate favorability.

6.1.5 Short-term Effectiveness

The option would remove the Primary Source area for short-term effectiveness. The Secondary and Tertiary source areas would require a much longer time for natural attenuation and is not an effective short-term remedy.





6.1.6 Implementability

The Primary Source area can be excavated using typical equipment and techniques. Due to the depth of the Secondary and Tertiary source areas, excavation is not feasible and natural attenuation is the most favorable option. The determination of infeasibility is based on safety concerns involved in excavating to 85 feet bgs, the surface area disturbance required to safely bench and shore an excavation to that depth, and the removal such a large volume of native soil. There is an estimated volume of 14,000 cubic yards of Tertiary Source material in the subsurface. The impacted soil is overlain by 15 to 40 feet of overburden that would additionally have to be removed. Surface disturbance and removal of such large volumes of native soil would result in more environmental harm than leaving the material buried in place. Excavation to extreme depths in such a large area introduces a safety hazard.

6.1.7 Costs

The estimated cost to remove the Primary Source area via excavation is approximately \$75,000. This is favorable and is a reasonable cost.

6.2 SOIL VAPOR EXTRACTION

SVE technology remediates petroleum hydrocarbon impacts *in situ* by applying a vacuum to wells drilled into the impacted area. The applied vacuum initiates air flow from the subsurface and into the SVE wells. The subsurface air flow enhances petroleum hydrocarbon volatilization and the vapors are pulled out by a blower/vacuum pump on the surface. The removed petroleum hydrocarbons are typically emitted directly into the atmosphere unless air permitting thresholds or sensitive receptors require air treatment with petroleum hydrocarbon removal.

Wells are drilled into the subsurface and screened to provide air flow evenly throughout the subsurface. When determining the number of wells and screen intervals, heterogeneities in the geology are considered to prevent air being pulled only through the most permeable zones. SVE systems typically operate for 1 to 10 years until cleanup is obtained. Geology can be too tight to allow airflow and, in such cases, SVE is not feasible. This option is evaluating the treatment of the Primary, Secondary, and Tertiary source areas.

SVE was in operation for approximately two years in the Primary and Secondary source areas. The system removed approximately 7 tons of petroleum hydrocarbons. Assuming the Primary and Secondary source areas have not been remediated, the system would require approximately 10 additional SVE wells and a larger blower to influence the full Secondary Source area volume. It is unknown if SVE would be effective in the silt present in the Secondary Source area, as the silt has less permeability and initiating airflow may not be feasible.

To expand the system to the Tertiary Source area, at least 30 new and nested SVE wells drilled to depths ranging from 30 feet to 80 feet bgs would be required with a significantly larger blower providing vacuum and flow. The consolidated sand found throughout a majority of the Tertiary Source area will likely be problematic and initiating airflow would be difficult. Typically, if the geology refuses a hollow-stem ager drill rig, then the material is not conducive for SVE technology as the material lacks sufficient permeability. The hollow-stem auger rig encountered refusal at 40 feet to 80 feet bgs during subsurface investigations.





6.2.1 Protection of HH&E

An SVE system would be protective of HH&E as it would remove petroleum hydrocarbons from the subsurface and remediate existing soil *in situ*. Bringing petroleum hydrocarbons to the surface could become an exposure pathway for human outdoor or indoor air inhalation; however, steps can be implemented to mitigate exposure potential through the treatment of vapors, institutional controls, and/or employee training. The SVE option is protective of HH&E with proper vapor exposure mitigation measures in place.

6.2.2 Compliance

The SVE technology would potentially bring the Site into compliance following 2 to 10-plus years of system operation. Soil confirmation samples would be collected from the subsurface and laboratory analytical results would be compared to the NMOCD remediation action levels.

6.2.3 Long-term Effectiveness and Permanence

COCs would be removed from the Site via the SVE system. Soil heterogeneities could limit the effectiveness of the SVE system and some areas of the Site may be untreatable via SVE technology. SVE is the second most favorable long-term effectiveness and permanent solution of the three options.

6.2.4 Toxicity, Mobility, or Volume Reduction Through Treatment

SVE would reduce the volume of contaminants in the subsurface, which would inhibit mobility into groundwater or other subsurface soil. Through SVE operation, the petroleum hydrocarbons would volatize and be released into the air (unless air emission treatment was conducted). In the air, the petroleum hydrocarbons could be ingested through inhalation, become a greenhouse gas, and/or act as an ozone precursor. Due to an influx of oxygen, some of the petroleum hydrocarbons would be reduced via aerobic microbial degradation. This option would reduce petroleum hydrocarbon volume but could provide additional exposure pathways for petroleum hydrocarbon inhalation. This option is less favorable when considering mobility of the contaminants. If air emission equipment is used, then this option is favorable.

6.2.5 Short-term Effectiveness

This option requires 2 to 10-plus years of operation and is not an effective short-term remedy. The number of required SVE wells and the blower capacity would need to increase to decrease the number of years of operation.

6.2.6 Implementability

The depth and the volume of the Tertiary Source impact would require a substantial SVE well infrastructure to influence all of the impacted zones. This not only includes laterally distributed wells, but nested vertical wells to address the 70-plus feet of vertical impact in the subsurface of the Tertiary Source area. Screening across 70 feet would be inefficient for vapor recovery and smaller intervals would be needed to generate sufficient vacuum. Preliminary design of the system indicated approximately 40 additional nested SVE wells will be required, and it is not certain the technology would





address COCs in the more consolidated sandstone. The system can be implemented but would require a large effort and continued operation and maintenance for a 2 to 10-plus year period. SVE ranks low for implementability.

6.2.7 Costs

Drilling for a significant SVE well infrastructure, blower equipment, controls, power drop, and air pollution control equipment would be a significant cost. The work is estimated at \$300,000 to \$500,000 for installation, plus another \$50,000 per year of operation and maintenance costs during the life of the system.

6.3 EXCAVATION

This alternative consists of removing impacted soil from the Primary, Secondary, and Tertiary source areas for disposal or treatment offsite. Hauling to the nearest off-site commercial disposal facility would require a truck hauling 16 cubic yards per trip, driving 25 miles round trip, for about 893 trips to haul all petroleum hydrocarbon impacted soil to a commercial disposal facility, thereby equaling 22,325 total miles driven. This poses adverse environmental and safety risks to the surrounding landscape, to personnel driving the trucks, and to other people residing or driving along the route to be used to haul the soil to the nearest landfill. Conducting an excavation to a depth of 90 feet bgs requires engineering controls and is a substantial effort. The sidewalls would need to be sloped to at least a 1:1 ratio which would cause a substantial surface disturbance. The surface disturbance is harmful to the surface environment and would affect operations at the Site and adjacent production locations.

6.3.1 Protection of HH&E

Based on the CSM and the size of the source areas, removing the Primary Source area via excavation would be the most favorable option for eliminating the potential threat of shallow impacts affecting HH&E. However, given the location and depth of the Secondary and Tertiary sources areas as discussed previously, the fact that there is no threat to HH&E under current and potential future conditions, an excavation of this size poses a safety threat to personnel and the environment that is not worth the environmental benefits.

6.3.2 Compliance

Compliance of source removal can be demonstrated through laboratory analysis of soil confirmation samples. Soil confirmation samples would be collected from the sidewalls and base of any excavation. Laboratory analytical results would be compared to the NMOCD remediation action levels.

6.3.3 Long-term Effectiveness and Permanence

Through excavation, COCs would be removed from the Site permanently. Source removal can be demonstrated through documentation and laboratory analytical results of soil confirmation sampling. Although excavation provides the fastest long-term effectiveness on site, it does not reduce the toxicity of contaminants in soil that is transferred to an alternative location.





6.3.4 Toxicity, Mobility, or Volume Reduction Through Treatment

Excavation would remove the contaminants and immediately reduce the toxicity, mobility, and volume of on-site contaminants; however, the toxicity and volume of contaminants would be transferred to a landfill and would experience anaerobic conditions, which would be the slowest of all remedial processes. The option is most favorable but would be less favorable if landfill disposal is considered as a transfer of impact.

6.3.5 Short-term Effectiveness

The option would remove the contaminants in the short term, resulting in high short-term effectiveness.

6.3.6 Implementability

The Primary Source area can be excavated using typical equipment and techniques. Due to the depth of the Secondary and Tertiary source areas, excavation is not feasible and is the least favorable option. Excavation equipment and trucking increase greenhouse gas emissions. Transferring the impact to a landfill is not sustainable.

6.3.7 Costs

Removing all three sources via excavation does not appear to be viable option. An excavation of that magnitude would require engineering design and controls to maintain safety and stability as well as relocating much of the on-site equipment. Including equipment costs, oversight, transportation, and disposal fees, this work is estimated to cost \$3,700,000.

6.4 PREFERRED ALTERNATIVE

Based on a review of the three alternatives, and with consideration of protective and balancing criteria, the preferred alternative is Primary Source area removal with natural attenuation of the Secondary and Tertiary source areas. This alternative is protective of human health and the environment because exposure pathways are incomplete due to the depth of impact and the absence of transport mechanisms in the source areas. Over the long term, contaminant toxicity and volume will naturally attenuate, and the implementation of the preferred alternative will not cause disturbance of the surrounding landscape, or transport contaminated media from one location to another location. The SVE option would provide a substantial investment in infrastructure, would increase emissions for the area surrounding the Site, and may not be feasible in the deep geologic setting. Excavating all of the source soil is technically infeasible and would transfer the petroleum hydrocarbons to a landfill and not reduce the toxicity and would create a significant safety concern, destroy vast amounts of undisturbed surface, and have a substantial greenhouse gas footprint from equipment and trucking.





7.0 FINDINGS AND REQUEST FOR VARIANCE

7.1 FINDINGS

Multiple soil sampling events were conducted at the Site between January 2016 and December 2018, as described in the LTE 2018 Summary Report and the Site Characterization section of this report. Results from the subsurface investigations indicated observed impacts are likely attributed to three different releases, one in 2016 and two historic releases. Petroleum hydrocarbon impacts resulting from the recent production tank release were relatively small in extent, while deeper soil impacted by two historical releases was demonstrated to be larger in volume and contained higher concentrations of COCs. Impacted soil from the three identified releases is limited to the vadose zone and restricted from migration to deeper groundwater by a low permeability clay. The lateral extent of the impacts does not exceed the site boundaries. The recent and shallow impacts are undergoing active remediation through SVE, which has likely remediated the Primary and Secondary source areas.

The CSM was developed to evaluate the three source areas and associated exposure pathways. The petroleum hydrocarbon impacts are defined as elevated concentrations of BTEX and TPH, which were observed to approximately 85 feet bgs, at which point a clay layer was observed, restricting further vertical migration of petroleum hydrocarbons. Transport mechanisms of COCs in the vadose zone were determined to be volatilization to soil gas, migration to groundwater, and groundwater migration to surface water. The potential for petroleum hydrocarbon vapor intrusion is possible; however, there are no habitable structures on the surface currently and no structures are expected in the future. Groundwater is estimated to be 200 feet to 250 feet bgs, which is much deeper than the impacted area and separated from the impacted soil by a low permeability clay layer that has demonstrated no impact to date from historical sources. The potential for surface water impact is low based on lack of impacted groundwater, the absence of nearby surface water bodies, and the presence of approximately 15 feet of clean overburden separating the impacts from the ground surface (assuming the Primary Source area is remediated). Disturbance of the buried impacted soil and extraction of the COCs entrained in that soil provides the greatest chance of exposure to human health and environment.

To evaluate remaining impacts at the Site, LTE proposes confirmation soil sampling of the Primary and Secondary source areas to evaluate remediation by SVE. This includes collecting soil samples in the western area as proposed in the 2018 Summary Report. LTE proposes to use a hollow-stem auger drill rig to advance two confirmation boreholes to 30 feet bgs near boreholes SVE-2 and SVE-5 in the locations identified on Figure 8 in the 2018 Summary Report. Boreholes will be positioned to supplement existing soil data. Continuous soil samples will be logged by an LTE geologist and described using the Unified Soil Classification System (USCS). The intervals from immediately beneath the ground surface to 10 feet bgs and then every 5-foot interval thereafter will be composited and screened for volatile aromatic hydrocarbons. Soil with the highest field screening results and from the bottom of each soil boring will be collected for laboratory analysis of BTEX and TPH (GRO, DRO, and MRO). If soil sampling results indicate the Primary and Secondary source areas have been remediated, those areas will be closed and the Tertiary Source area will be addressed by natural attenuation as described below.

Based on a review of remedial alternatives, and with consideration of protective and balancing criteria, the preferred remedial alternative for soil exceeding the NMOCD remediation action levels following





confirmation soil sampling is Primary Source area removal with natural attenuation of the Secondary and Tertiary source areas.

A second alternative that was evaluated included installing an SVE system appropriately designed for Secondary and Tertiary source areas. This alternative would require too many wells with depths to 85 feet bgs and uncertainty regarding the success of this method in the deeper, more consolidated sediments. The process is costly, time consuming, and would create a pathway for surface exposure to petroleum hydrocarbon vapors.

A third alternative evaluated was excavation to the depths at which the Secondary and Tertiary source areas occur. This type of deep excavation would require extensive engineering and most likely shutdown operations at the Site and adjacent production operations. Excavation would create a pathway for surface exposure to petroleum hydrocarbon vapors and direct contact to impacted soil during excavation. The removal and disposal by truck poses adverse environmental and safety risks to the surrounding undeveloped landscape, the personnel driving the trucks, and other people residing or driving along the route to be used to haul the soil to the nearest landfill. In addition, excavation to an offsite disposal area would transfer the contamination to another area.

7.2 VARIANCE REQUEST

The preferred alternative, although protective, would result in leaving impacted media in place exceeding NMOCD remediation action levels. As such, a variance is required according to 19.15.29.14 NMAC. The variance requirements include discussion of a need for a variance and a demonstration of how the variance will provide better or equal protection of public health, safety, and the environment.

The need for a variance is presented in the analysis of remedial alternatives. The available methods of treatment include natural attenuation, excavation, or SVE. Confirmation of remediation and subsequent removal of shallow residual impacts in conjunction with natural attenuation of deeper impacts is the most logical remedial alternative as determined by a detailed comparative analysis derived from USEPA feasibility policy based on threshold and balancing criteria, which include protection of HH&E, long- and short-term effectiveness, reduction of toxicity, implementability, and cost.

Equal or better protection of public health and the environment through the preferred remedial alternative is documented in the evaluation of transport mechanisms and exposure pathways that concludes there is no complete pathway for human or environmental exposure to the COCs. Those pathways are significantly altered and effectually opened by excavation or SVE remediation alternatives, which bring the subsurface impact to the surface as vapors that can impact humans and the environment.

Based on full delineation and characterization of vadose zone impacts at the Site, no complete pathway to human or environmental exposure to identified COCs, and a thorough evaluation of remedial alternatives, Hilcorp requests approval to proceed with confirmation sampling of the Primary and Secondary source areas and to address any residual impacts in those areas and identified impacts in the Tertiary Source area by natural attenuation.



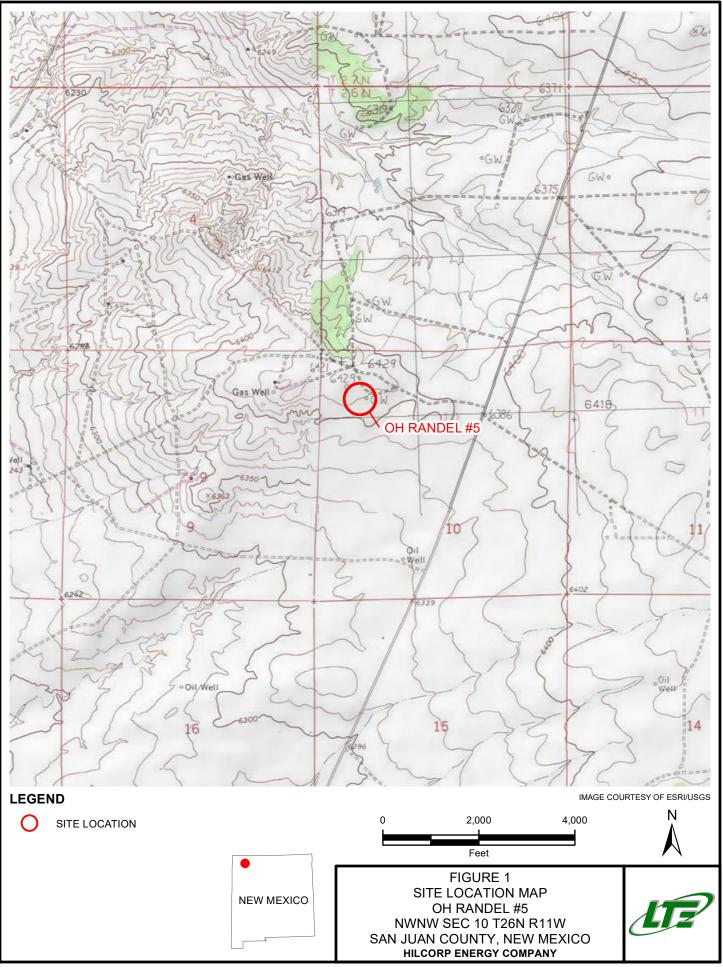


8.0 REFERENCES

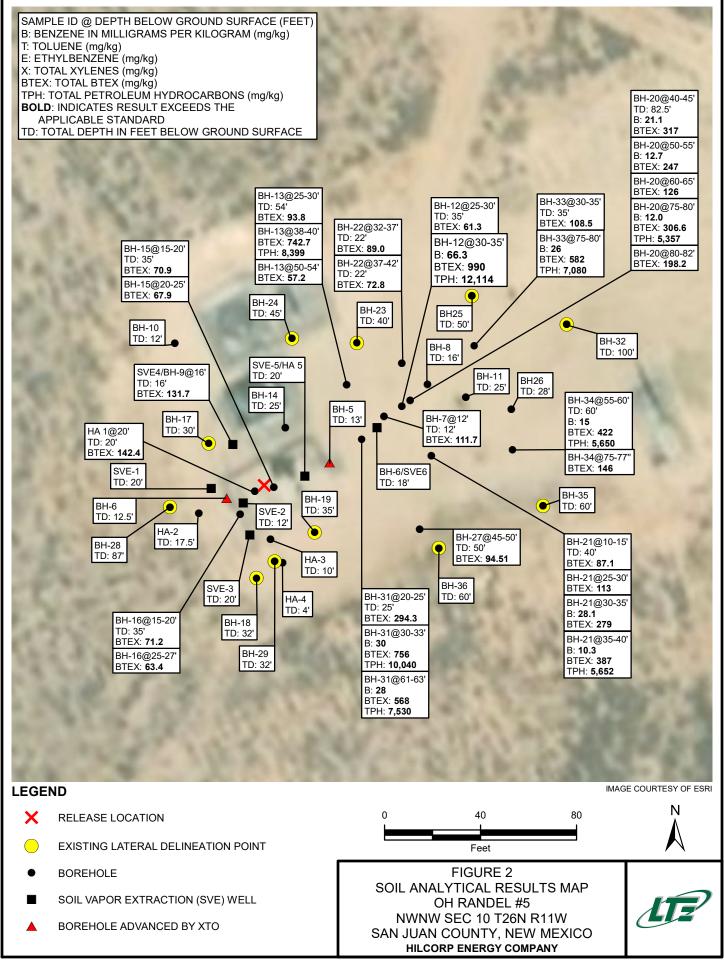
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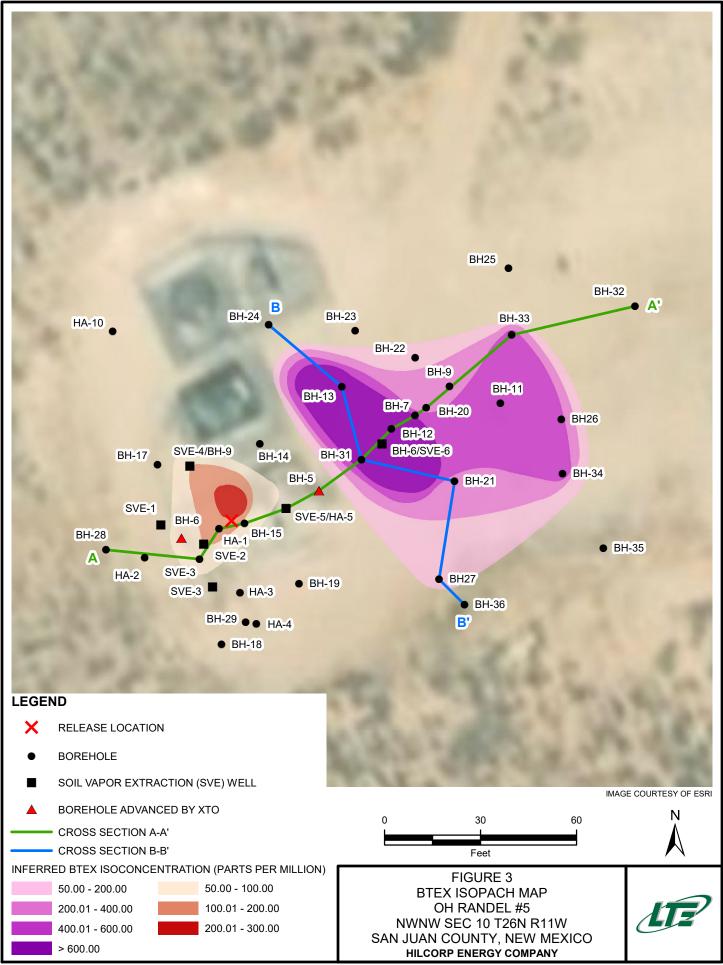


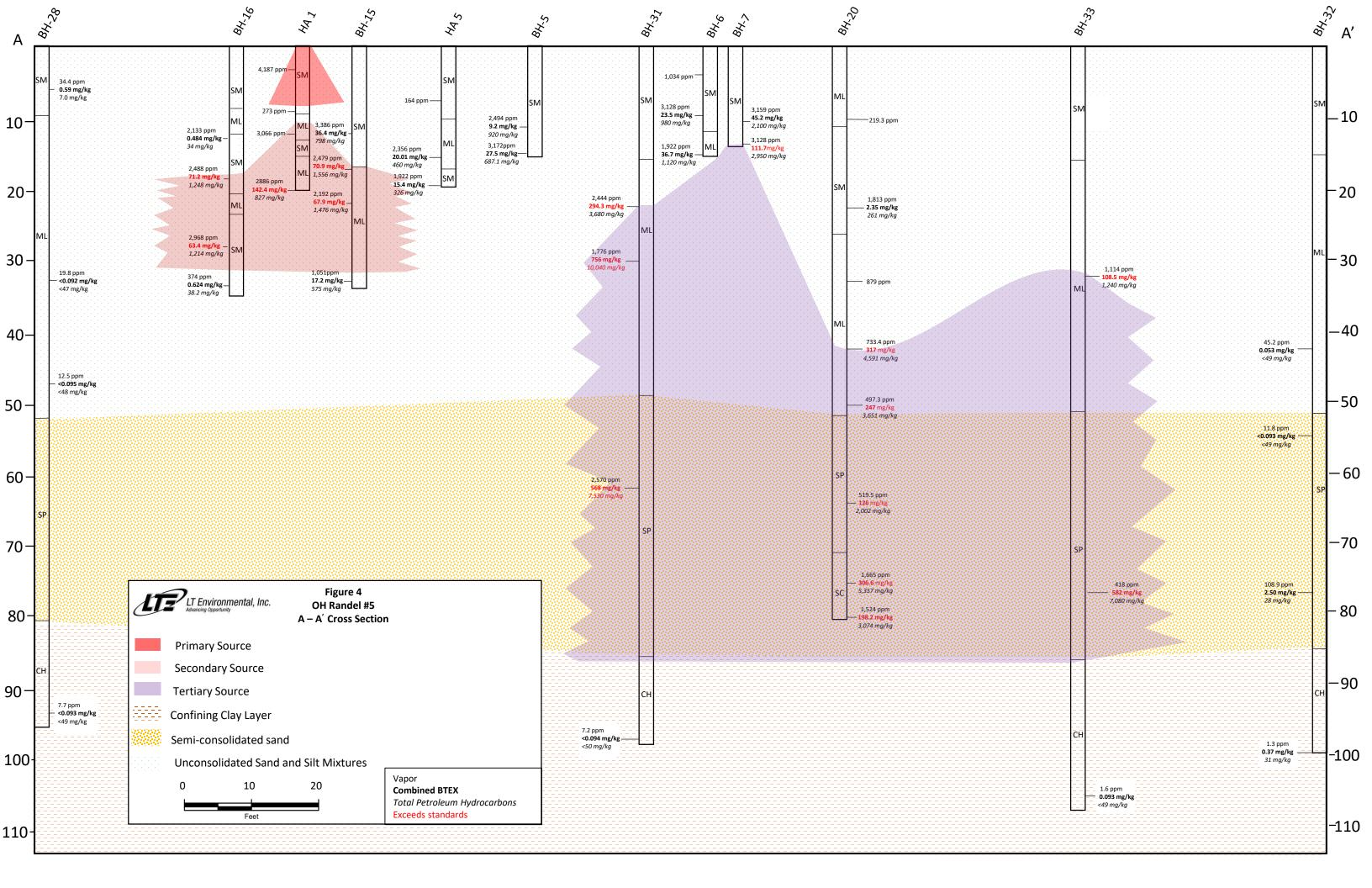


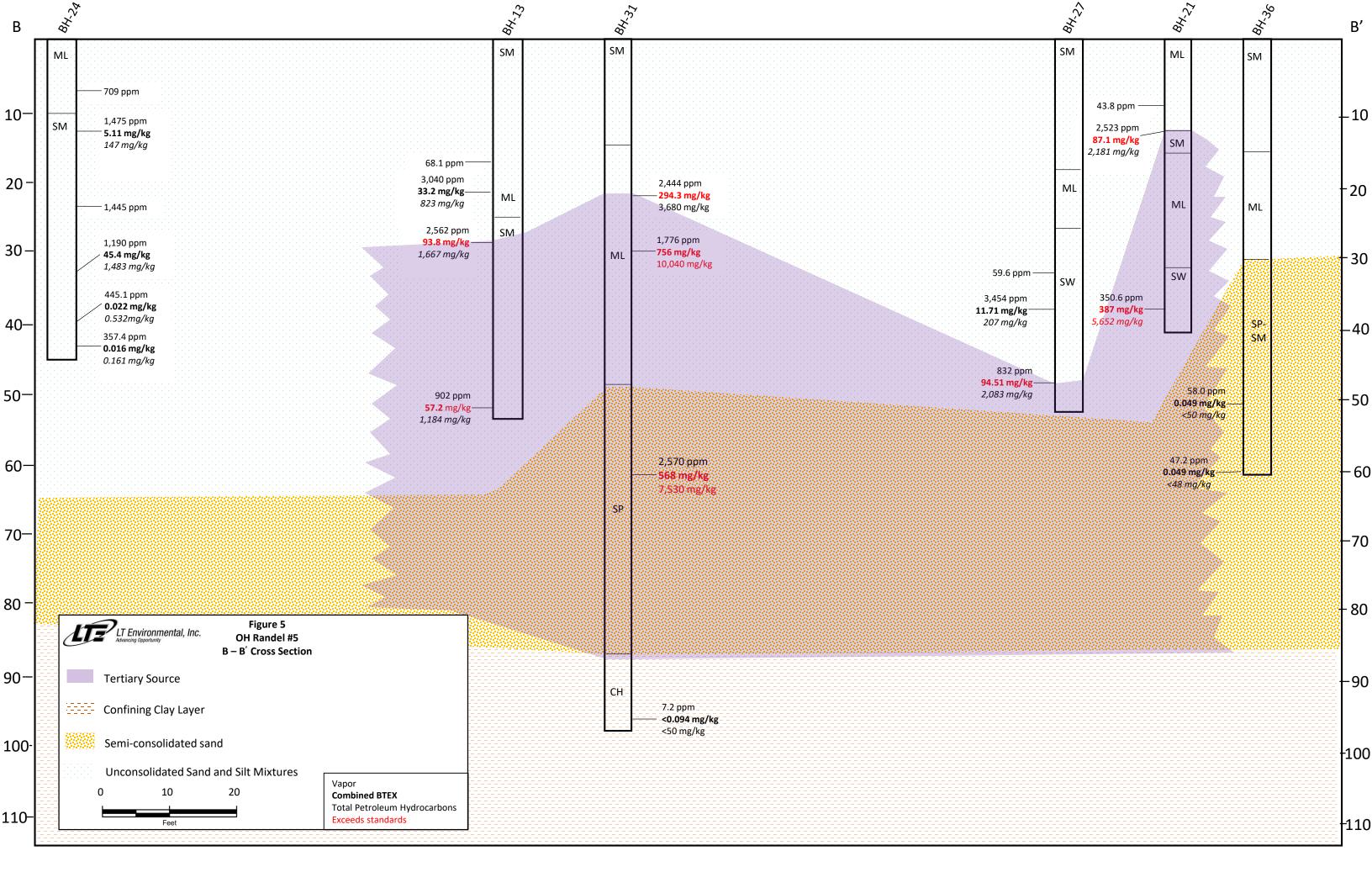


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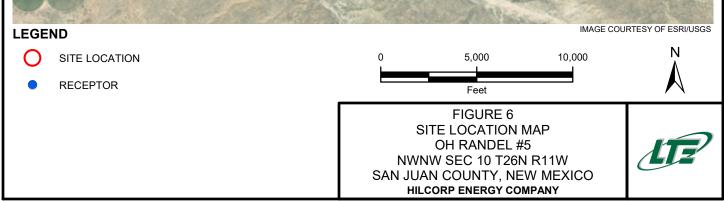












TABLES



TABLE 1 BOREHOLE SOIL ANALYTICAL RESULTS

OH RANDEL #5 SAN JUAN COUNTY, NEW MEXICO XTO ENERGY, INC

Soil Sample ID	Sample	Depth	Vapor	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	GRO	DRO	MRO	ТРН
	Date	(feet)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HA 1	7/5/2016	20	2,886	5.1	56	7.3	74	142.4	810	17	NA	827
HA 5	7/5/2016	16	2,356	0.21	3.5	1.3	15	20.01	310	150	NA	460
HA 5	7/5/2016	21.5	1,922	<0.10	2.4	1.0	12	15.4	260	66	NA	326
	8/2/2016	9	3,128	<0.49	1.8	1.7	20	23.5	840	140	NA	980
BH-6	8/2/2016	18	1,922	< 0.49	7.3	2.4	27	36.7	1,000	120	NA	1,120
	8/2/2016	11	3,159	<0.42	2.6	3.6	39	45.2	1,700	400	NA	2,100
BH-7	8/2/2016	12	3,128	<0.42	9.4	8.3	94	111.7	2,600	350	NA	2,950
BH-8	8/2/2016	16	3,125	<0.47	<0.94	1.3	12	13.3	560	340	NA	900
BH-9	8/2/2016	16	2,413	<1.0	23	8.7	100	131.7	2,200	240	NA	2,440
*BH-5 @ 9.2'	11/18/2016	9.2	2,494	<0.121	<1.21	<0.121	9.2	9.2	783	137	NA	920
*BH-5 @ 13'	11/18/2016	13	3,172	0.314	<2.45	1.28	25.9	27.494	633	54.1	NA	687.1
*BH-6 @ 9'	11/18/2016	9	2,197	< 0.0495	<0.495	<0.0495	<0.148	<0.148	51.1	17.9	NA	69
*BH-6 @ 10'	11/18/2016	10	2,980	0.0218	< 0.00500	0.188	0.0413	0.2511	138	9.27	NA	147.27
*BH-6 @ 12.6'	11/18/2016	12.6	2,347	< 0.0122	<0.122	<0.0122	< 0.0368	<0.122	53.9	5.81	NA	59.71
BH-11 @ 20-25'	4/19/2017	20-25	0.6	< 0.000612	< 0.00612	< 0.000612	0.00220	0.00220	<0.122	<4.95	<4.95	<4.95
BH-12 @ 0-10'	4/19/2017	0-10	51.4	<0.000538	<0.00538	<0.000538	< 0.00161	<0.00538	<0.108	5.66	<4.44	5.66
BH-12 @ 10-15'	4/19/2017	10-15	1,001	<0.110	<1.10	0.403	2.11	2.51	401	39.7	4.39	441
BH-12 @ 15-20'	4/19/2017	15-20	73.1	0.000728	0.00750	0.00379	0.0779	0.0892	2.36	508	8.00	518
BH-12 @ 20-25'	4/19/2017	20-25	269	0.00535	0.0218	0.0114	0.156	0.189	4.02	67.1	<4.48	71.1
BH-12 @ 25-30'	4/19/2017	25-30	1,904	0.149	2.98	2.82	55.5	61.3	1,260	275	<4.48	1,535
BH-12 @ 30-35'	4/19/2017	30-35	1,632	66.3	392	39.8	558	990	11,400	687	26.7	12,114
BH-13 @ 0-10'	4/19/2017	0-10	0.7	<0.000570	<0.00570	<0.000570	< 0.00171	< 0.00570	<0.114	<4.65	<4.65	<4.65
BH-13 @ 10-15'	4/19/2017	10-15	1.4	0.00113	< 0.00567	< 0.000567	0.0444	0.0455	1.32	<4.63	<4.63	1.32
BH-13 @ 15-20'	4/19/2017	15-20	68.1	< 0.000590	< 0.00590	<0.000590	0.0132	0.0132	0.672	8.14	<4.72	8.81
BH-13 @ 20-25'	4/19/2017	20-25	3,040	<0.114	<1.14	1.59	31.6	33.2	698	120	5.29	823
BH-13 @ 25-30'	4/19/2017	25-30	2,562	0.871	27.9	6.39	59.5	93.8	1,380	277	9.51	1,667
BH-13 @ 30-35'	4/19/2017	30-35	1,694	5.31	45.6	8.48	70.1	124.2	1,950	240	7.61	2,190
BH-13 @ 38-40'	9/28/2017	38-40	1,172	73.4	378	43.7	321	742.7	8,090	295	14.4	8,399
BH-13 @ 50-54'	9/28/2017	50-54	902	0.592	14.8	4.07	38.3	57.2	908	257	18.8	1,184
BH-14 @ 15'-20'	4/20/2017	15-20	231	0.00116	<0.00586	0.0175	0.0491	0.0666	0.966	<4.78	<4.78	0.966
BH-14 @ 20'-25'	4/20/2017	20-25	16.0	<0.000529	<0.00529	<0.000529	0.00185	0.00185	<0.106	<4.50	<4.50	<4.50
BH-15 @ 0-10'	4/20/2017	0-10	2,949	<0.0277	<0.277	<0.0277	2.04	2.04	61.8	50.5	<4.48	112
BH-15 @ 10-15'	4/20/2017	10-15	3,386	< 0.0572	3.87	2.82	29.7	36.4	651	147	<4.67	798
BH-15 @ 15-20'	4/20/2017	15-20	2,479	0.525	10.7	5.23	55.0	70.9	1,270	286	<4.97	1,556
BH-15 @ 20-25'	4/20/2017	20-25	2,192	0.117	10.2	4.63	53.1	67.9	1,110	366	<4.52	1,476
BH-15 @ 30-32'	4/20/2017	30-32	1,051	0.812	3.53	1.16	12.5	17.2	549	25.6	<4.43	575
BH-16 @ 0-10'	4/20/2017	0-10	164	< 0.000552	< 0.00552	<0.000552	0.00315	0.00315	<0.110	7.67	<4.50	7.67
BH-16 @ 10-15'	4/20/2017	10-15	2,133	< 0.000558	0.00694	0.0352	0.442	0.484	11.5	22.7	<4.70	34
BH-16 @ 15-20'	4/20/2017	15-20	2,488	0.143	7.02	3.79	60.2	71.2	1,150	97.8	<4.76	1,248
BH-16 @ 23-25'	4/20/2017	23-25	2,606	<0.115	2.37	1.36	17.6	21.3	399	169	<4.59	568
BH-16 @ 25-27'	4/20/2017	25-27	2,968	0.252	11.5	4.43	47.5	63.4	997	217	<4.53	1,214
BH-16 @ 27-29'	4/20/2017	27-29		0.107	5.72	2.14	17.2	25.1	600	51.0	<4.51	651
BH-16 @ 33-35'	4/20/2017	33-35	374	0.0252	0.242	0.0393	0.343	0.624	5.34	32.9	<4.41	38.2
BH-17 @ 20-25'	4/21/2017	20-25	362	0.000588	0.00605	0.00778	0.150	0.164	5.52	5.26	<4.51	10.78
BH-18 @ 30-32'	4/21/2017	30-32	9.8	< 0.000522	< 0.00522	<0.000522	0.00646	0.00646	<1.04	<4.26	<4.26	<4.26
BH-19 @ 30-35'	4/21/2017	30-35	113	0.000866	<0.00521	<0.000521	0.00464	0.00464	<0.104	<4.30	<4.30	<4.30
BH-20 @ 20-25'	8/21/2017	20-25	1,813	0.0138	<0.125	<0.000321	2.35	2.35	96.9	150	13.8	261
BH-20 @ 40-45'	8/21/2017	40-45	733.4	21.1	125	18.8	152	317	4,170	421	<40.0	4,591
BH-20 @ 50-55'	8/22/2017	50-55	497.3	12.7	90.9	15.7	128	247	3,310	336	5.44	3,651



TABLE 1 BOREHOLE SOIL ANALYTICAL RESULTS

OH RANDEL #5 SAN JUAN COUNTY, NEW MEXICO XTO ENERGY, INC

Soil Sample ID	Sample Date	Depth (feet)	Vapor (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
BH-20 @ 60-65'	8/22/2017	60-65	519.5	2.26	32.9	9.6	80.8	126	1,600	392	9.8	2,002
BH-20 @ 75-80'	9/28/2017	75-80	1,665	12.0	114	21.6	171	306.6	4,900	435	21.5	5,357
BH-20 @ 80-82'	9/28/2017	80-82	1,524	2.11	63.8	13.4	121	198.2	2,710	340	24.2	3,074
BH-21 @ 10-15'	8/21/2017	10-15	2,523	<0.500	5.39	<0.500	81.7	87.1	1,710	457	14.0	2,181
BH-21 @ 25-30'	8/21/2017	25-30	1,259	2.47	29.1	8.57	72.7	113	1,880	325	8.88	2,214
BH-21 @ 30-35'	8/21/2017	30-35	624.1	28.1	123	13.9	114	279	3,620	95.8	<20.0	3,716
BH-21 @ 35-40'	8/21/2017	35-40	350.6	10.3	131	26.8	219	387	4,810	842	<40.0	5,652
BH-22 @ 24-26'	8/21/2017	24-26	1,523	0.0142	<0.125	<0.0125	0.859	0.873	82.5	64.1	<20.0	147
BH-22 @ 32-37'	8/21/2017	32-37	1,047	0.841	22.7	7.02	58.4	89.0	1,430	360	<20.0	1,790
BH-22 @ 37-42'	8/21/2017	37-42	304.7	3.50	25.6	4.42	39.3	72.8	1,250	92.7	<20.0	1,343
BH-23 @ 30-35'	8/22/2017	30-35	246.9	0.0192	0.0386	0.00242	0.0229	0.0831	0.470	<4.00	<4.00	0.470
BH-23 @ 35-40'	8/22/2017	35-40	349.2	0.00512	0.0102	0.00133	0.00697	0.0236	0.195	<4.00	<4.00	0.195
BH-24 @ 10-15'	8/22/2017	10-15	1,475	0.276	0.517	0.517	3.80	5.11	180	40.8	<4.00	121
BH-24 @ 30-35'	8/22/2017	30-35	1,190	0.462	4.82	3.17	37.4	45.4	1,000	483	<20.0	1,483
BH-24 @ 35-40'	8/22/2017	35-40	445.1	0.00431	0.0085	<0.000500	0.00915	0.0220	0.532	<4.00	<4.00	0.532
BH-24 @ 40-45'	8/22/2017	40-45	357.4	0.00369	0.00711	0.000684	0.00471	0.0162	0.161	<4.00	<4.00	0.161
BH-25 @ 30-35'	9/28/2017	30-35	112	0.00956	0.0413	0.00304	0.0534	0.0977	0.399	5.0	<4.97	5.399
BH-25 @ 45-50'	9/29/2017	45-50	8.9	0.000770	< 0.00528	<0.000528	0.00202	0.00202	<0.106	<4.22	<4.22	<4.22
BH-26 @ 20-25'	9/29/2017	20-25	0.0	0.0103	0.0146	<0.000622	0.00390	0.0185	<0.124	<4.98	<4.98	<4.98
BH-27 @ 35-40'	9/30/2017	35-40	3,454	0.0442	0.863	1.19	9.66	11.7130	207	<5.29	<5.29	207
BH-27 @ 40-45'	9/30/2017	40-45	1,947	<0.263	5.91	3.98	35.4	45.29	621	303	26.7	951
BH-27 @ 45-50'	9/30/2017	45-50	832	<0.533	18.9	7.51	68.1	94.51	1,540	510	33.2	2,083
BH-28 @ 0-10'	12/17/2018	0-10	34.4	<0.025	0.21	<0.049	0.38	0.59	7.0	<9.9	<49	7.0
BH-28 @ 30-35'	12/17/2018	30-35	19.8	<0.023	<0.046	<0.046	<0.092	<0.092	<4.6	<9.3	<47	<47
BH-28 @ 45-50'	12/19/2018	45-50	12.5	<0.024	<0.048	<0.048	<0.095	<0.095	<4.8	<9.6	<48	<48
BH-28 @ 85-87'	12/19/2018	85-87	7.7	<0.023	<0.047	<0.047	<0.093	<0.093	<4.7	<9.7	<49	<49
BH-29 @ 10-15'	12/17/2018	10-15	1.0	<0.024	<0.047	<0.047	<0.095	<0.095	<4.7	<9.5	<47	<47
BH-29 @ 27-32'	12/17/2018	27-32	0.8	<0.023	<0.047	<0.047	< 0.094	<0.094	<4.7	<9.5	<48	<48
BH-31 @ 20-25'	12/16/2018	20-25	2,444	1.3	100	13	180	294.3	3,400	280	<49	3,680
BH-31 @ 30-33'	12/16/2018	30-33	1,776	30	360	36	360	756	9,600	440	<49	10,040
BH-31 @ 61-63'	12/19/2018	61-63	2,570	28	270	28	270	568	7,200	330	<50	7,530
BH-31 @ 94-96'	12/19/2018	94-96	7.2	<0.023	<0.047	<0.047	<0.094	<0.094	<4.7	<10	<50	<50
BH-32 @ 40-45'	12/14/2018	40-45	45.2	<0.023	0.053	<0.047	<0.093	0.053	<4.7	<9.8	<49	<49
BH-32 @ 50-57'	12/14/2018	50-57	11.8	<0.023	<0.047	<0.047	<0.093	<0.093	<4.7	<9.8	<49	<49
BH-32 @ 75-80'	12/18/2018	75-80	108.9	0.069	0.66	0.14	1.70	2.50	28	<9.6	<48	28
BH-32 @ 95-100'	12/18/2018	95-100	1.3	0.024	0.048	<0.047	0.30	0.37	31	<9.9	<50	31
BH-33 @ 30-35'	12/13/2018	30-35	1,114	<1.2	31	6.5	71	108.5	1,100	140	<46	1,240
BH-33 @ 75-80'	12/14/2018	75-80	418	26	250	26	280	582	6,900	180	<50	7,080
BH-33 @ 100-105'	12/17/2018	100-105	1.6	<0.023	0.093	<0.046	<0.046	0.093	<4.6	<9.7	<49	<49
BH-34 @ 55-60'	12/15/2018	55-60	1,118	15	180	22	220	422	5,300	350	<44	5,650
BH-34 @ 75-77'	12/15/2018	75-77	943	1.9	49	9.0	86	146	1,700	170	<43	1,870
BH-35 @ 45-50'	12/15/2018	45-50	73.1	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<9.0	<45	<45
BH-35 @ 55-60'	12/15/2018	55-60	18.1	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.8	<49	<49
BH-36 @ 50-55'	12/16/2018	50-55	58.0	<0.024	0.049	<0.047	<0.095	0.049	<4.7	<10	<50	<50
BH-36 @ 55-60'	12/16/2018	55-60	47.2	<0.024	0.049	<0.049	<0.098	0.049	<4.9	<9.6	<48	<48
NMOCD Closure Criteria				10	NE	NE	NE	50	NE	NE	NE	5,000

NOTES:

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

* - Boreholes drilled by XTO

Bold - indicates value exceeds stated NMOCD standard

BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes analyzed by EPA method 8021

DRO - diesel range organics analyzed by EPA Modified Method 8015

GRO - gasoline range organics analyzed by EPA Modified Method 8015

mg/kg - milligrams per kilogram

NE - Not established

NMOCD - New Mexico Oil Conservation Division

ppm - parts per million

TPH- total petroleum hydrocarbons



TABLE 2 THRESHOLD AND BALANCING CRITERIA

OH RANDEL #5 SAN JUAN COUNTY, NEW MEXICO XTO ENERGY, INC.

Remedial Alternatives	Protection of Human Health and the Environment	Compliance	Long Term Effectiveness and Permanence	Toxicity, Mobility, or Volume Reduction Through Treatment	Short-Term Effectiveness	Implementability	Cost
Option 1 – Primary Source Area Removal with Natural Attenuation of Secondary and Tertiary Source Areas	Removing the Primary Source area via excavation would be the most favorable option for eliminating shallow impacts. However, given the location and depth of the Secondary and Tertiary source areas, there is no threat to human health and environment under current and potential future conditions.	Primary Source area removal would bring the site into partial compliance. Natural attenuation of the Secondary and Tertiary source areas would eventually bring contaminant concentrations into compliance.	Natural processes would eventually degrade contaminants resulting in long- term effectiveness and permanence.	Primary Source area would be eliminated. Secondary and Tertiary source area contaminants are degraded <i>in situ</i> by biological processes that will reduce the petroleum hydrocarbons to carbon dioxide and water. The process takes time to reduce the toxicity, mobility, and volume. As it is a non-active remediation strategy that requires time, the option has intermediate favorability.	This option would remove the Primary Source area for short-term effectiveness. The Secondary and Tertiary source areas would require a much longer time for natural attenuation and is not an effective short-term remedy.	The Primary Source area can be excavated using typical equipment and techniques. Due to the depth of the Secondary and Tertiary source areas, excavation is not feasible and natural attenuation is the most favorable option.	Minimal – Cost is estimated at \$75,000. Most favorable option.
Option 2 – Soil Vapor Extraction (SVE) of Primary, Secondary, and Tertiary Source Areas	Petroleum hydrocarbons are removed from the subsurface but could create an exposure pathway for air inhalation. Treatment of vapors and institutional controls could prevent exposure. Protective with proper vapor mitigation measures in place.	Could bring the site into compliance within 2 to 10-plus years.	The SVE process long-term effectiveness and reliability has intermediate favorability. Soil heterogeneities could limit the effectiveness of the SVE system.	SVE would reduce the volume of contaminants in the subsurface, which would inhibit subsurface mobility. Petroleum hydrocarbons would be released into the air (unless air emission treatment was conducted) and could be inhaled, become a greenhouse gas, and/or act as an ozone precursor. This option is less favorable when considering mobility and favorable if air emission equipment is used.	The process does require time and would require 2 to 10-plus years of system operation. The option is moderately favorable when compared to excavation.	A substantial SVE well infrastructure is required to influence all three impacted zones. Preliminary design of the system indicated approximately 40 SVE wells. The system can be implemented but would require a large effort and continued operation and maintenance for a 2 to 10- plus year period. Low implementability.	Moderate – Cost is estimated at approximately \$300,000 to \$500,000 plus \$50,000 annually for operation and maintenance. Intermediate favorability.
Option 3 – Excavation of Primary, Secondary, and Tertiary Source Areas	Removing the impacted soil via excavation would eliminate the contaminants of concern (COCs) from the site. However, an excavation of this size could pose a safety threat to personnel and would be an Occupational Safety and Health Administration (OSHA) engineered excavation. The impact would be brought to the surface which could open an exposure pathway.	Would bring the site into compliance with excavation but would result in the potential for exposure to COCs during excavation.	COCs would be removed from the Site but transferred to another location. Confirmation soil sampling would ensure reliability.	Excavation would remove the COCs and immediately reduce the toxicity, mobility, and volume of on-site COCs; however, the toxicity and volume of contaminants would be transferred to a landfill and experience anaerobic conditions, which would be the slowest of all the processes. The option is most favorable but would be less favorable if landfill disposal is considered a transfer of impact.	Contaminants removed quickly. The most favorable short-term effectiveness of the three options.	The Primary Source area can be excavated using typical equipment and techniques. Due to the depth of the Secondary and Tertiary source areas, excavation is not feasible. The least favorable option.	High cost due to equipment, trucking, and disposal fees. Approximately \$3,700,000. Least favorable option.







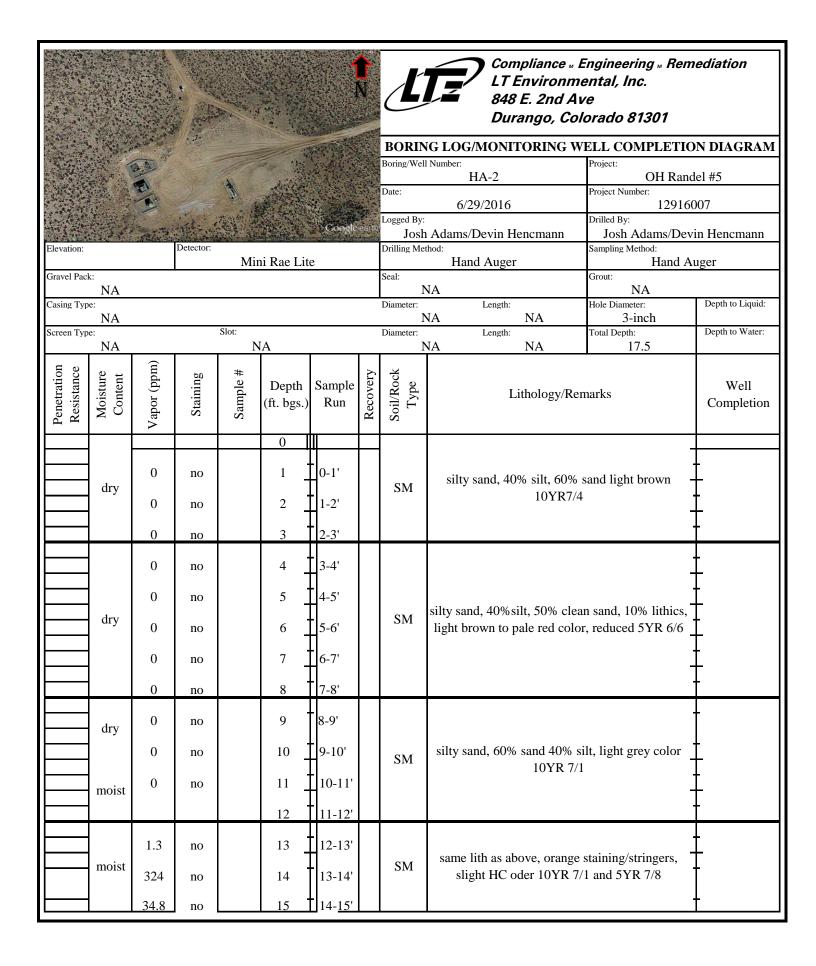


Compliance _# Engineering _# Remediation LT Environmental, Inc. 848 E. 2nd Ave Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: Project: HA-1 OH Randel #5 Date: Project Number: 6/29/2016 12916007 .ogged By: Drilled By: Josh Adams/Devin Hencmann Josh Adams/Devin Hencmann Sampling Method Detector Drilling Method: Elevation Mini Rae Lite Hand Auger Hand Auger Gravel Pack: Seal: Grout: NA NA NA Diameter: Length: Hole Diameter: Depth to Liquid: Casing Type: NA NA NA 3-inch Slot: Depth to Water: Diameter: Length: Total Depth: Screen Type: NA NA NA NA 19.5' Vapor (ppm) Penetration Soil/Rock Type Resistance Moisture Staining Sample # Recovery Content Depth Sample Well Lithology/Remarks Run (ft. bgs.) Completion 0 4187 0-1' yes 1 2 2822 yes 1-2' 483 3 2-3' yes 859 4 3-4' yes silty sand, 40% silt, 40% sand 10% mud brown, dry SM hc oder, HC stains 10YR7/4 473 5 4-5' yes 564 6 5-6' no 7 273 yes 6-7' 8 7-8' 785 yes 999 8-9' 9 yes **9**-10' silty sand 35% silt, 40% fine sand 10% med 10 3066 yes sand, 5% course grey color, HC oder and stains ML dry 3746 11 10-11' seems to be historic, becoming more yes consolidated 10YR 7/1 3584 12 11-12' yes 2655 13 12-13' yes dry SM grey, stained, mc clay compact 10YR 6/1 3384 ves 14 13-14' 14-15' ML transition to a silty clay dry 3441 15 yes

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Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	(ft. bgs.)		Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
	dry	2886	yes		15 16	15-16'		ML	Light brown silty	clay, ml compact 10YR 7/4	
			<i>j</i> • ~								
		2322	yes		17	16-17'				-	
	dry	1977	yes		18	17-18'		ML	light brown silty	sand, loose, ml 10YR 7/4	-
		2886	yes		19	18-19.5)'				-
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Boring/Well # HA-2	
Compliance & Engineering & Remediation Project: OH Randel #5	
Project # 12916007 Date 6/29/2016	
Penetration Resistance Moisture Content Conten	Well Completion
Lithology/Remarks Lithology/Remarks moist 3.2 no 15 Rm 20 21 SM same lith as above, orange staining/stringers, slight HC oder 10YR 7/1 and SYR 7/8 moist 3.2 no 16 15-16' SM same lith as above, orange staining/stringers, slight HC oder 10YR 7/1 and SYR 7/8 10 no 17 16-17' 16 15-16' SM 10 no 17 16-17' 16 15-16' SM 10 no 17 16-17' 16 17 16 10 18 19 1 1 1 1 1 11 12 20 1 1 1 1 1 12 21 22 1 1 1 1 1 1 12 23 24 1	

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						128 14 1				MONI	FORING V	VELL COMPLETI	ON DIAGRAM
			ALL ST					Boring/Well		A-3		Project: OH Rat	ndel #5
		EL.						Date:		/2016		Project Number: 1291	
			Cher .	The second				Logged By:				Drilled By:	
Elevation:		Star 1	Detector:			GOOGIC	eon n Seasan o	Josh Drilling Met	Adams/D	evin H	encmann	Josh Adams/De Sampling Method:	evin Hencmann
				Miı	ni Rae Lit	e				Auger		Hand	Auger
Gravel Pack	NA								NA			Grout: NA	
Casing Typ	e: NA							Diameter:	NA	Length:	NA	Hole Diameter: 3-inch	Depth to Liquid:
Screen Typ				Slot:	JA			Diameter:	NA	Length:	NA	Total Depth: 10	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		L	ithology/Re	-	Well Completion
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		0	no		1 _	0-1'							Ξ I
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		0	no		3.	2-3'							+
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		0	no		7	6-7'							+
		65	no		8	7-8'							Ŧ I
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		3062	yes		10	9-10'			roalter	oount-	nod duilling	advanced storms	Ţ
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						A CONSIL		BORIN	G LOG/MONITORI	NG WELL COMPLE	FION DIAGRAM
A. 17				111				Boring/Well	Number: HA-4	Project:	andel #5
		-		1				Date:		Project Number:	
				na all			たちの	Logged By:	6/29/2016	Drilled By:	016007
Elevation:	的社	Sala A	Detector:	ALC: NO		Google	earth	Josh Drilling Met	Adams/Devin Hencma	nn Josh Adams/I Sampling Method:	Devin Hencmann
			Detector.	Miı	ni Rae Lit	e			Hand Auger	Hand	d Auger
Gravel Pacl	 NA							Seal: N	JA	Grout: NA	
Casing Typ								Diameter:	Length: NA NA	Hole Diameter: 3-inch	Depth to Liquid:
Screen Typ	e:			Slot:	T A			Diameter:	Length:	Total Depth:	Depth to Water:
	NA	(7			JA				NA NA	13	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litholog	gy/Remarks	Well Completion
					0						
		0	no		1.	0-1'					+
		0	no		2	1-2'					Ŧ
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		0	no		3	2-3'					\pm
		0	no		4	3-4'					Ŧ
	dry	0	no		5	4-5'		SM		0% clean sand 10% lithi vn 10YR 7/4	
		0	no		6	5-6'			6		<u>+</u>
		0	no		7	6-7'					Ŧ
					-						†
		0	no		8 _	7-8'					±
		0	no		9	8-9'					
		0	no		10	9-10'					
	moist	0	no		11	+ +-		ML		hesive, light brown 10¥ 7/4	
		0	no		12	tl					<u> </u>
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	-	CHA-	5	1. Section	T			Boring/Wel	l Number: HA-5	Project: OH Ran	del #5
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Google eer	th the	No.	Sec. 1		1911612	son	A N	Logged By:		Drilled By: Josh Adams/A	
Elevation:			Detector:	M				Drilling Me	thod:	Sampling Method:	
Gravel Pac				IVIII	ni Rae Lit	e		Seal:	Hand Auger	Grout:	Auger
Casing Typ								Diameter:	NA Length:	NA Hole Diameter:	Depth to Liquid:
Screen Typ	NA ne:			Slot:				Diameter:	NA NA Length:	3-inch Total Depth:	Depth to Water:
	NA				JA	1			NA NA	21.5	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/	Remarks	Well Completion
					0	I		-	silty sand with some grav	vel 70% sand 25% silt	
	dry	0	no		1	0-1'		SM	5% gravel med-fine grav red brown 2	ined subrounded, pale	+
		0	no		2	1-2'					
		0	no		3	2-3'			Same as above except no	aravel 70% sand 30%	1
	dry	0	no		4	3-4'		SM	silt 2.5Y	-	±
		0	no		5	4-5'					+
		0	no		6	5-6'			fine grained silty sand	60% sand 40% silt	+
	dry		по		• <u>-</u>	Π		SM	subrounded, light go		†
		0	no		7	6-7'					
	dry	0	no		8	7-8'		SM	silty sand with clay 60% s light tan grey	•	+
		0	no		9	8-9'				101K //J	<u>†</u>
		0	no		10	9-10'					+
		0	no		- 11	10-11'			same lith as above, oran	oe stainning/stringers	Ŧ
	dry		no			Π		SM	10YR 7/2 an		†
		0	no		12	11-12'					
		164	no		13	12-13'					Ţ
	dry	427	no			13-14'		SM	silty sand with clay 60% s very fine to fine graine brown 10	ed sand, dark golden	ţ
		2241	yes		15	14-15'		I			

[D : (N/ 11 //		
II		•		- ·		<i>"</i>			Boring/Well #	HA-5	
			ance "	Engine	ering ⊪ l	Remedia	atio	п	Project: Project #	OH Randel#5	
		LTEn		iental,	mc.				Date	7/5/2016	
e p				-#			~	×	Dute	// 5/2010	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	(ft. bgs.)		Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					15						
		2356	yes		16	15-16'					+
	dry	2017	yes		17	16-17		ML		ontent, silty sand with clay silt 15% clay, no staining	+
	•	1857	yes		18	17-18'				-	+
}		1993	yes		19	18-19'					
	dry	2168	yes		20	19-20'		SM	clay light	y 60% sand, 30% silt, 10% tan grey 10YR7/2	
		1922	yes		21	20-21.5	5'			vel 55% sand 35% silt, 10%	
	dry	1116	yes		_			SM	sand light b	d, very fine to fine grainded rown grey 10YR 7/2	
					22				rock encountered	, drilling advance stopped	
	ļ				-	ĻI					↓
	4				23					-	-
	ł				24	$\left \right $					+
	ł				24	H				-	+
	1				25						+
	1									-	+
	1				26						†
	1				_	Π				-	T
]				27	Ľ				-	L
]				-						Ļ
	ł				28 _	H					∔ ∣
	ł				29	+1					+
├───	4				<u> </u>	H				•	+
	1				30	t I					†
	1				_	Π				•	Ť I
]				31	Ц					I I
					_	LI					⊥ I
	ļ				32	Ц					↓
	ļ					LI					↓
I├───	ł				33	H				-	+
I├───	ł				34	+I					+
├───	1				- 54	H				-	+
	1				35	†I					†
	1				-	Π				-	† I
]				36	Ĥ					Į l
					37	+					+

		R						Ľ	LT Environn 848 E. 2nd A		nediation
		B. W.		AN -	H	1	A series		NG LOG/MONITORING	WELL COMPLETIO	ON DIAGRAM
		3-	CH+6	12			1000	Boring/We	1 Number: BH-6	Project: OH Rane	del #5
				Te			-	Date:	8/2/2016	Project Number: 12916	007
Google eart		- upres	. into	1	17161	son	A N	Logged By Jos	Adams/Devin Hencmann	Drilled By: Louis Ti	ujillo
Elevation:			Detector:	Miı	ni Rae Lit	te		Drilling Me	thod: Geo Probe	Sampling Method: Contin	lous
Gravel Pacl	 NA				-			Seal:	NA	Grout: NA	
Casing Typ								Diameter:	Length: NA NA	Hole Diameter: 3-inch	Depth to Liquid:
Screen Typ				Slot:	JA			Diameter:	Length: NA NA	Total Depth: 18	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Lithology/R		Well Completion
					0	Щ		SM			
		0	no		1	0-1'					+
		0	no		2	1-2'					+
		0	no		3	2-3'					ł
	dry	0	no		4	3-4'			silty sand, 40% silt, 50% f		Ŧ
	ury	0			5	4-5'			light brown 10	0YR 7/4	+
		0	no			4-5					+
		0	no		6 -	5-6'					$\frac{1}{4}$
		0	no		7	6-7'					+
		1034	yes		8	7-8'					<u>†</u>
		3128	yes		9	8-9'					†
		2390	yes		10	9-10'				C 1.000	†
	dry	3010	yes		11	<u>1</u> 0-11'			silty sand, 30% silt, 30% sand 10% lithics light		+
		2654	yes		12	11-12'					+
		1884	yes		13	12-13'					ł
		1927	yes		13	12-13			silty sand 45% silt 50% fin	ne sand 5% med cand	÷
	dry	3025	yes		14	13-14			light grey brown		ł

ſ									D	BH-6	1
II									Boring/Well #		
		Compli	ance "	Engine	ering "I	Remedia	atio	n	Project: Project #	OH Randel#5	
		LTĖn	vironn	iental,	INC.				Date	8/2/2016	
<u>п</u> п									Date	0/2/2010	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	(ft. bgs.)		Recovery	Soil/Rock Type	Litho	Well Completion	
					15					-	
	dry	2390	yes		16	15-16'				50% fine sand 5% med sand y brown 10YR 7/2	-
		2425	yes		17	16-17'				-	-
		1922	yes		18	17-18'				6 1 101	
					19 20				Ie	fusal at 18' -	+
					21 22					<u>-</u>	-
					23					-	- -
					24	-				- -	-
					25					- - -	-
					26 27					-	-
					28					-	-
					29	+				-	+ -
					30					-	
					31	+				-	- -
					32 33	+ +				-	- -
					34					-	
					35	+ +				-	+ -
					36	+ 				-	
					37						

	I							Ľ	LT Enviro 848 E. 2nd	e _« Engineering _« I nmental, Inc. d Ave Colorado 81301	Remediation
			BHJ	AND NO	4		Statul V	BORIN Boring/Well		Project:	
			No.				130	Date:	BH-7	Project Number:	Randel #5
Cooole ear		- Starting		in N	Laple 1	-	A	Logged By:	8/2/2016	Drilled By:	916007
Elevation:	A Second	a what is	Detector:	E	r in the	90 1	IN	Josh Drilling Met	Adams/Devin Hencman	n Loui Sampling Method:	s Trujillo
Gravel Paci	k.			Min	i Rae Lit	e		Seal:	Geo probe		ntinuous
	NA							N	IA	Hole Diameter:	Depth to Liquid:
Casing Typ	NA			<u>01</u>					IA NA	3-inch	
Screen Typ	NA			Slot: N	A			Diameter:	Length: IA NA	Total Depth: 12	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology	/Remarks	Well Completion
					0	0-1' 1-2'	N R		no rec	overy	
	dry	108 3.5	no no		3 <u>-</u> 4	2-3' 3-4'		SM	silty sand with gravel , gravel light br		% +
					5	4-5' 5-6'	NR		no rec	covery	+
	dry	13.9 34	no no		7 8	6-7' 7-8'		SM	silty sand 40% silt, 30 sand minor course li	% fine sand 20% me ght brown 10YR 7/4	d
	dry	1805	yes		9 10	8-9' 9-10'		SM	silty sand 30% silt 30 sand minor course, HC	c oder light grey brow	
		3159	yes		11	10-11'			10YI	R 7/2	‡
		3128	yes		12	11-12'			refusal	at 12'	
					- - -				rerusar	at 12	‡ †
					•	+					<u> † </u>

								Ľ	LT Environn 848 E. 2nd A		nediation
				CBHI-8	-		and and	BORIN	G LOG/MONITORING V	VELL COMPLETI	ON DIAGRAM
		A	and	12	1		1	Boring/Well	Number: BH-8	Project: OH Ran	del #5
				Ter .	The second se		-	Date:	8/2/2016	Project Number: 12916	5007
Google ear	h	-	Sec.	4	1-11-14	aon	A N	Logged By: Iosh	Adams/Devin Hencmann	Drilled By: Louis Tr	niillo
Elevation:			Detector:	Mir	ni Rae Lit	0		Drilling Met		Sampling Method: Contin	
Gravel Pac				WIII		C		Seal:	•	Grout:	uous
Casing Typ								Diameter:	Length:	NA Hole Diameter:	Depth to Liquid:
Screen Typ				Slot:				Diameter:	NA NA Length:	3-inch Total Depth:	Depth to Water:
_	NA	(1		N	A				NA NA	16	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Re	emarks	Well Completion
					0						+
					1	0-1'	N				+
					2	1-2'	R		no recove	ery	+
		0	20		3	2-3'					Ť
	dry	3	no		4	3-4'		SM	silty sand with surface grav 7/4	el light brown 10YR	+
					5	4-5'					+
					-	Π	NR		no recove	ery	+
						5-6'					
		5.3	no		7 _	6-7'					+
	dry	1.5	no		8	7-8'		SM	silty sand 60% sand 40% si 7/4	ilt light brown 10YR	Ţ
		2	no		9	8-9'			//4		t
		2.2	no		10	9-10'					<u>+</u>
		468	no		11	10-11'					+
		772	no			11-12'					Ŧ
	moist	112	110		-			ML	silty sand with clay 50%		Ļ
					_	12-13'			clay, light grey brow	WII IUIK //2	<u>+</u>
		88	no			13-14'					
					15	14-15'					<u>†</u>

									Boring/Well #	BH-8]
		Comnli	ianco	Engine	ering " I	Pomodia	atio	n	Project:	OH Randel#5	
/[7	_	LT Env	ance « vironn	ciiyiiit Iontal	enng ∞1 Inc	Nemeala			Project #		
				ienial,	mc.				Date	8/2/2016	
ц n)									Date	0/2/2010	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)		Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
	moist	3125			15 16	15-16'		ML		50% sand 40% silt 10% clay y brown 10YR 7/2	+
		3125	yes		10	15-10			referred at 10		
					$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				refusal at 16'		
	- - -				29 30	- - -					
					31 32	- - -					
					33 34	- -					+
					35 36	-					- - -
					37	-					+

4	(C)	A					1	Ľ	LT Environ 848 E. 2nd Durango, 0		
	15					1	2	BORIN	G LOG/MONITORING	WELL COMPLETI	ON DIAGRAM
in the	-	ВН-9		No.	1			Boring/Well	Number: BH-9	Project: OH Ran	del #5
22							-	Date:	8/2/2016	Project Number: 12916	
pogle earti	h	3- 11			inter and		A N	Logged By:		Drilled By:	
evation:	1. TOO	ar were	Detector:		T DUBOR	90 ft	10	Josh Drilling Met	Adams/Devin Hencmann	Louis Tr Sampling Method:	rujillo
avel Pack	<u>.</u>			Mi	ni Rae Lit	e		Seal:	Geo probe	Grout:	uous
	NA							Ν	VA Lanatha	NA Hole Diameter:	Depth to Liquid:
sing Typ	NA			~					Length: IA NA	3-inch	
reen Typ	e: NA			Slot:	JA			Diameter:	Length: NA NA	Total Depth: 16	Depth to Water:
Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/	Remarks	Well Completion
					0	0-1' 1-2' 2-3'	N R		no reco	overy	+ + + +
	dry	0	no		4	3-4'		SM	silty sand with surface gr 7/4	-	-
		0	no		5	4-5'					+
		0 0.4	no no		6 7	5-6' 6-7'					Ī
		0.6	no		8	7-8'		a	silty sand 40% silt 40%	5 fine sand 20% med	Ŧ
	dry	0.0	no		9	8-9'		SM	sand light brow		ł
		3.7	no		10	9-10'					ł
		13.5	no			10-11'					ł
		776	yes		-	11-12'					Ŧ
		1927	yes			12-13'					Ŧ
	dry	2355	yes		13 -	13-14'		SM	silty sand 50% med sand light grey 10YR7/2 h		Ŧ
		2333	yes		14	13-14			ngin 6107 1011(7/21	e caer una stummig	1

Elevation: Gravel Pack: Casing Type:	IA		Detector:	Mir	ni Rae Lit	Goode		BORIN Boring/Well Date: Logged By: Josh Drilling Met Seal:	l Number	G/MONIT		M ELL COMPLETI Project: Project Number: 12910 Drilled By: Louis T Sampling Method: Contir Grout: NA Hole Diameter:	ndel #5 5007 rujillo
N Screen Type:	IA IA			Slot:	[A			Diameter:	NA NA	Length:	NA NA	3-inch Total Depth: 12	Depth to Water:
Penetration Resistance Moisture		Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)		Recovery	Soil/Rock Type		Li	thology/Rer		Well Completion
	ry	0 0 0 0 0 0 0 0 0	no no no no no no no		0 1 2 3 4 5 6 7 8	0-1' 1-2' 2-3' 3-4' 4-5' 5-6' 6-7' 7-8'		SM		-		clean sand 10% own 10YR 7/4	
d	ry	0 0 0 0	no no no no		_	8-9' 9-10' 10-11' 11-12'		ML	silty s		ay 50% sand re, light grey refusal at 1		+ + + +
													+ + + +

							Ľ	LT Environm 848 E. 2nd A	•	iation
an a	Salines Cont							NG LOG/MONITORING	WELL COMPLET	ION DIAGRAM
Constantin References References							Date:			ndel #5
		200 S			n an the second s			4-19-17		6007
levation;		Detector			Coogl	e end		D. Burns	GEO	MAT
		Detector:		PID			Drilling M	ethod: Hollowstem Auger	Sampling Method: 2 Conti	
Bravel Pack: <u>NA</u>							Seal:	NA	Grout: NA	
Casing Type: NA							Diameter:	Length: NA NA	Hole Diameter:	Depth to Liquid: NA
creen Type: NA			Slot:	JA			Diameter:	Length: NA NA	Total Depth: 25'	Depth to Water:
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	1 -	Recovery	-	Lithology/E	· · · ·	Well Completion
Dry	0.0	No		0	PID.	[UD	sw 5M	Road base 0-6" 4/3 10 YR Brown well with sult. No	graded sand stainfodor.	Benlonita Cap
Dy	0.0	No	BH -11 0-10	3	0.0	60%	SM	SAA. Silly sand. 6/3 2.54	l yellowish gray	
Pry	0.3	N.		∧√5 6		50		SAA	they still	+ + +
Dry	0.3	No		7		80	sМ	Dense graytsh brown sand. No slo		+
Dry	0.0	NJ		9 <u>10</u>	•	100	SP	SAA Oxidized orangishitu NO S/O	n coarse sand	+
Pry			BH -11	10 11 12	PID comp.			SAA. No s/o		+ +
_	0.3		10-15	13 14	0.2			yruy the ish tan med- no s/o	coarse sand	+
Pry	9.3			_15	_ 		ML	Brownish alree silf No 5/0	with sand	ł

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					Boring/Well #	BH-11	
		ering "Remediatio	on		Project:	OH Randel #5	
	Environmental,	inc.			Project #		_
					Date	4-19-17	
Penetration Resistance Moisture Content Vapor	(ppm) Staining Sample #		Recovery	Soil/Rock Type		ology/Remarks	Well Completion
Dry 0.6	NU .5 No No	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	-	ML	Brownish red Atu s/O Slightly gray straw No s/c No s/c Some consolut.	tolive silt w/sawd	

		р р (1) (1) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2					Ľ	LT Environr 848 E. 2nd		ediation
							BORIN Boring/We	NG LOG/MONITORIN	G WELL COMPLE	TION DIAGRAM
			A.				Date:	Dri-12		Randel #5
	.0 				Cowili		Logged By	4-19-17 DB	Drilled By:	916007
vation:		Detector:		DID		earen Serren	Drilling Me		Sampling Method:	OMAT .
avel Pack: NA		I <u></u>		PID			Seal:	Hollowstem Auger	Grout:	tinuous
ing Type: NA							Diameter:	NA Length: NA NA	NA Hole Diameter:	Depth to Liquid:
een Type: NA			Slot:	JA .			Diameter:	Length: NA NA	Total Depth:	Depth to Water:
Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology	/Remarks	Well Completior
	0.4	No	BH-12		0-10 comp. PID		SP -5M	Reddesh brown me No s/c	ed smil w/soft	
Maist	0-0	Nə	0-10	4	0.8 ppm	_		-Some corbonate ma	ternal. No s/o	
DM	0.8			6 _					÷	
 	51.4	sleght odo r		9 10 11	\$0-15 FOMD	_	ŝ	Lt. gray tan. den silty sand. Stright		
Dry	656	SIt. Odðir		12 13	947		58	SAA, shight-Mi gas odor.	od sweet degrad.	
	1001	mod		14	ppm		SM	54 A .		ł

Compliance ** Engineering ** Remediation LT Environmental, Inc. Project: Oth Runde(#5 Index Date 4-19.17 Index Index Date 4-19.17 Index Index Index Well Index Index Index Index Well Index Index Index Index Well Index Index Index Index Index Well Index Index Index Index Index Well Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index Index <						
LT Environmental, Inc. LT Environmental, Inc. Project # Date <u>4-19.17</u> Date <u>4-19.17</u> Uithology/Remarks Well Completion Lithology/Remarks Completion 15 16 15-20 17 18		nalasadas n		Boring/Well #	BH-12	
Date 4-19-17 Date 4-19-17 Image: Strate in the strate in		nymeering « Remediation			Uti Kundel #5	- <i></i> =
Well Depth Depth Sample Ann Image: Strate of the second se					4-19.17	
15 16 17 18 15 16 15-20 17 18 10 15-20 17 18 15 16 15-20 17 18 15 16 15-20 17 18 15 16 15-20 17 15 16 15 16 15 15 15 15 15 15 15 15 15 15		#				
16 15-20 17 comp 18	Penetrati Resistan Moistur Conten Vapor (ppm) Staining		Recover Soil/Roci Type	Litho	ology/Remarks	Well Completion
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Dry 269 No Dry 1904 No	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	2' SP SM .5 SPSM	Lt tan sand slit. odor. SAA, Lt tan slt. odor	w/silt.	

				Ē	Compliance " I LT Environme 848 E. 2nd Au Durango, Col	<i>ie</i>	ediation
				ING LOG			TION DIAGRAM
			Date:		BH-13	Project: OH F Project Number:	Randel #5
			Logged I		1-17		916007
evation:	Detector:	Coogl	Drilling 1)D .	Burns		OMAT
avel Pack:		PID	Seat;		stem Auger		ntinuous
NA			Diameter	NA	Length:	NA Hole Diameter:	Depth to Liquid:
NA	Slot:		Diameter		NA Length:	Total Depth:	Depth to Water:
				NA 	NA	, <u>, .</u>	
Resistance Moisture Content Vapor (ppm)	Staining Sample #	Depth Sample (ft. bgs.) Run	Recovery Soil/Rock Type		Lithology/R	emarks	Well Completion
M. 0.1 M	No No	$ \begin{array}{c} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \end{array} $ $ \begin{array}{c} 0.7 \\ 0.7$	4'		the brown sand s /0 Storm sand carbonate. Dam	W/silt, Wsilt t-some podor. No starn	
M 0.7	No	8 9 10 11 12 13 10-15 Comp			Nive BRN Sand Odor, Nosta		
Dry	-	14 PID: 15 13.7	2 ¹ 58-5M	Lt. gr	ay w/oxidiz.	sand w/silt	

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		Complia	ince Fr	naineeri	ng "Rem	adiation			Boring/Well # Project:	BH-13 Otl Randel #5	
	Z	LT Envi	ronmer	ntal. Inc	ng « nenn L	eulution			Project #	United to	
									Date	4-19-17	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
	Dry.	68.1	No		15 16 17 18 19 20 21		1.5	5 5 M M L	Brownish gruy silt - Lt. gruyich olive	and olive sand w/ silt w/ caud No S	
	Dry	3,040	No		22 23 24 25 26 27			M L SM	SAA - some cem -Uf. Bootsta o sand w/gilt.	eutation \$17,000r love + Brown med. Mod. Odor.	
	Dry	2,562	No		27 28 29 30 31		3	SP SM	mod. odor	med sound w/sill. . Lite daegraded leney.	
)ry	1,694	Næ		32 33 34 35 36 37	2. 2	2.5	S₩	Very Lt. groy, med- syrawel	(vanse sand W)	

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							Ľ		T Environmo 48 E. 2nd Au Jurango, Col	ve lorado 81301	
						19.00		ll Mumber		WELL COMPLET	FION DIAGRAM
							<u> </u>	BH	14	OH R	andel #5
							Date:	4-20-	17		16007
				S. Maria	Coogle Coogle	e earl	Logged By	D. Burns	5	Drilled By: GEO	OMAT
levation:		Detector		PID			Drilling M	ethod: Hollowstem		Sampling Method:	inuous
iravel Pack: N.	 A						Seal:	NA		Grout:	
Casing Type: N							Diameter:	Leng		NA Hole Diameter:	Depth to Liquid:
creen Type:			Slot:	JA			Diameter:	NA Leng	NA th: NA	Total Depth:	Depth to Water:
Penetration Resistance Moisture	Content Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.	· -	Recovery			Lithology/R	emarks	Well Completion
Daw	ę 0.0	No	вн- 14 0-10'	0 1 2 3 4 5		3'	sp _{sm}			d & sand w/	
du-	0.0	No	PID COMP D.O. PPM BH	6 7 8 9 10 11 12	PID rowe	1'	SPSM	Brown mea No S/O			
Dr	0.1	NJ	10-15	13 14 15	. 0.1		m l SPSM	(rirony south San Lt groy w/o kidi	vdy silt, po zution medf	urteal commentation . 11. sound w/silt /	-No 5/0

$\begin{array}{ c c c c c c c c c c c c c c c c c c c$				-		<u>_</u> `				Dening/W-11#		
$\begin{array}{ c c c c c } \hline U & U & Environmental, inc. \\ \hline \hline Data & 4-2Q-(T) \\ \hline Data & 4-2Q-($			Comnlie	nnco E	ninaari	na . D	adiati			Boring/Well #	BH-14	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$							eulation				UTI Kandel HD	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			LI LIIVI	onnel	nui, 1110	**					4-70-17	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	E 8	o		50	#				<u>×</u>	Sulv		
$Dry = \begin{array}{c} 16 \\ P_{1}H_{1} \\ H_{2} \\ H_{1} \\ H_{2} \\ H_{2} \\ H_{1} \\ H_{2} \\$	Penetratio Resistanc	Moistur Content	Vapor (ppm)	Staining	Sample 7			Recover	Soil/Rocl Type	Lithe	ology/Remarks	
		Dry Dry	231 9.1	No stight sally odor	BH- 140 155 20 BH	(ft. bgs.) 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34	Run PID Comp 231	- · ·	SPSM ML	Lt. growish Brown - On the shoe: M Markow It. dense, It. Ut gray w/ oxidus concentation, sli	silty sand led. gray sondy silt, stain todor tion sandy silt, purtial abily salty odor,	Completion

Elevation:			Detector			- 	c co-n)	BORID Boring/We Date: Logged By Drilling Me	LT Environ 848 E. 2nd Durango, C NG LOG/MONITORIN II Number: BHI-15 4-20-17 D. Burns	Colorado 81301 IG WELL COMPLET Project: OH Ra Project Number: 1291 Drilled By:	
Gravel Pac	NA				PID			Seal:] Diameter:	Hollowstem Auger NA Length:		Depth to Liquid:
Screen Typ	NA pe: NA			Slot:	 JA		_	Diameter:	NA NA Length: NA NA	Total Depth:	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery			//Remarks	Well Completion
	Moist Moist Dry Dry	0.4	No No Yes	BH- 15 (2) 10'	0 1 2 3 4 5 6 7 8 9 10 11	1,554	3	SPSM.	Reddish Brown sav No s/o Reddish brown sand u Reddish brown me W/silt. No s Lt gray tograyy silty sandy W/oxi stain, slight or	More Dense v/sill. No s/o ed-coars= sand	
-	Bory Moist	3386 2785	yes yes	0H- 15 10-15	12 13 14 15	P1D COMP 2618	<u> </u>		Lt gray tolog Karay remented lens. Mo Lt gray samed, m mod-stain/odor	ed-course	

.

<u></u>					*		-			
		_		<i></i>				Boring/Well #	BH-15	
	complie	nce "E	ngineerii	ng "Reme	ediation			Project:	OH Randel#5	
	LT Envi	ronme	ntal, Inc					Project #	4/00/0015	
	T		<u> </u>		 _			Date	4/20/2017	
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
Suger Work	2,192		BH- 15 15-201 BH- 20-25	15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37	PID camp z192		ML	Olive gray br Nostain, mo Possible slough, r	e silty sand. No stain by silty mod stain/ada own silty sand od odor.	

								L	LT Environm 848 E. 2nd A	•	diation
								5.10 ····	NG LOG/MONITORING		TION DIAGRAM
					1. 19 19 - 19 - 19 19 - 19 - 19				BH-16		andel #5
		8 - 8		a li				Date:	4-20-17		16007
					N. W.	Coogli Coogli	e carti	Logged By	D. Burns		DMAT
Elevation:			Detector:		PID			Drilling M	ethod: Hollowstem Auger	Sampling Method: Cont	inuous
Gravel Pac	NA							Seal:	NA	Grout: NA	
Casing Typ	NA							Diameter:	Length: NA NA	Hole Diameter:	Depth to Liquid:
Screen Typ	NA			Slot:	JA			Diameter:	Length: NA NA	Total Depth:	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample) Run	Recovery		Lithology/	Remarks	Well Completion
	Dry	0.7	No	BH- 16 (0-10)	0 1 2 3 4 5 6	Plp WW	3	SRM	EFON Reddish Bro NO stuin/odor	wn sound w/sil	
	Mutist	164	6" 425		7 8 9	35.8	<u>-</u> 3′		SAA - Redduch sen Brown sen		
		787 2,133 2,7039	Synt	8H - 16 2 10-15	11 12 13 14 15	PID comp 1,352	\$5	ML. SØSM	Lt. gray oliver silty sa gray sandy sett m - Lt gray silt w/ save = Lt gray to brown sleight to mod s/	nd. sleant slo od. slo .d. Mod slo	

								Boring/Well #	BH-16	
\\/ _ /				ng "Rem	ediation			Project:		
	LT Envi	ronme	ntal, Ind	5.				Project #	OH Randel #5	
	Т	<u> </u>		T —				Date	4/20/2017	
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completion
Dry Dry	0 110 %	No No No	Sa	15 16 17 18 19 20 21 22 23 24 25 26 27	BH- 16 23:25 BH-16 23:25 BH-16 23:25 27-29 27-29 27-29 27-29 27-29 23-35	2'	SPSM SP SM SP SM SP SM	Possi Brown silty san odor. Dark gray silt Augered to Split spoon Lt olive brown Sith. No stain Coarsening to slight odor SAA - Lt. Brown that stain. Mod. Ode L t. Brownish gr W/ silt. No sta xylen odor.	23' med fin sand w/	

								Ľ	Íz	LT Environn 848 E. 2nd A		diation
								BORII Boring/We			G WELL COMPLE	TION DIAGRAM
								Date:	u numper;	BH1-17	Project: OH R Project Number:	andel #5
	an on B			Jen H				Logged By		21-17		16007
Elevation:			Detector:				earth	Drilling Me		Burvs		TAMC
Gravel Pack			<u> </u>		PID			Seal;		wstem Auger	Grout:	tinuous
Casing Type		-						Diameter:	NA	Length:	Hole Diameter:	Depth to Liquid:
creen Type	NA NA			Slot:	IA.			Diameter:	NA	Length:	Total Depth:	Depth to Water:
e e		Î							NA	NA		
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		Lithology/	Remarks	Well Completion
· · · ·					0	-						
	Mowt	0,5	No	BHI- 17	3 _ 4 _	- - - -	3'	SP SM	K eddi	sh Brown sand No 3/0	kw/sitt.	
	-		-	© ()-10'	5 6 7	- ~						+ + + + + + + + + + + + + + + + + + + +
	Moist	0.0	No		8 9	-	3'	SPSM	Dense	n silly saud. A Lt brown sil	t with sand. Some	
			-	BM	10 11 12			ML	contro	nate t UXidation.	No 5/d	
\	Дгу	0.3	No	ET 10-15	12 13 14					ay sand w/ silt		
				•			2.5	>M			sand. V. dense.	

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117	Complia LT Envir	nce ∝ Er ronmei	ngineerii ntal, Inc	ng " Remi :.	ediation			Boring/Well # Project: Project # Date	BH-17 OH Randel #5 4-21-17	
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
Monst Dry Dry	362	No	BH 17 15-20 15-20	15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37			SP SM	Lt. Brown Fn. Servi deuse.	ned. sand. No s/o sand w/ solt. No S/O.	

				Ľ	LT Environme 848 E. 2nd Av Durango, Colo	e orado 81301	
				175- 778	NG LOG/MONITORING HI Number: BH-18	Project:	
				0 Date:	4-21-17	Project Number:	andel #5
			Nig SGoogle ∈	Logged By		Drilled By:	D16007
vation:	Detector:	PID		Drilling M		Sampling Method:	tinuous
avel Pack: NA				Seal:	NA	Grout: NA	
sing Type: NA	·····			Diameter:	Length: NA NA	Hole Diameter:	Depth to Liquid:
reen Type: NA		Slot: NA		Diameter:	Length: NA NA	Total Depth;	Depth to Water:
Resistance Moisture Content	Vapor (ppm) Staining	[™] Depth Und Cft. bgs.		Recovery Soil/Rock Type	Lithology/Re	emarks	Well Completion
			∄				+
	D.7 NO	2 3 4 5 6 7 8			Reddosh Brown Sand NOS/O H.gray silty soundwill organics, SAA: Nos/o Lt gray + tan.		
		3 4 5 6 7		- ML - ML - ML - SPSM	- U. gray silly sound w/ organics,	/earbondre No ≤là orme ox. No 5/6 nd. W/ 4" coorse	

1									Daning/Wall #	BH-18	
	7	Comnlii	nnco F	naineeri	ng "Rem	adiation			Boring/Well # Project:	OH Randel #5	
				ngineerii ntal, Inc		= 41411011			Project #		
	_		onne						Date	4/21/2017	
Penetration Resistance	Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		ology/Remarks	Well Completion
	λγ	0.0	No		15 16 17 18 19 20 21 22		2'	SP/SM	CH. Brown sandy Lt Brown san	silt partial comment lons d w/silt. No s/o -	
	ry T	6.4	No		23 24 25 26		ļ,s —			n sand well graded 15c. partially Very very slight swedtess mel.	
	ry	3.2	No		27 28 29 <u>30</u>			SW	Ton medium so slightly cousoli No s/O	- - - - -	- - - -
D	ry.	9.8	No		31 32 33		2'	512	len med coc pertual cement:	nise send w/gravel No s/o.	- - -
					34 35 36 37					* + + + + + + + + + + + + + + + + + + +	-

								Ľ		Environme 8 E. 2nd Av	-	diation
	10							BORIN Boring/We	I Number: BH-	19	Project Number:	Randel #5
Elevation;			Detector:			Coegli Coegli	cart	Logged By:	D. Burn		Drilled By: GE	016007 OMAT
Gravel Pack:			Benefor		PID			Drilling Me Seal:	Hollowstem A	uger	Grout:	tinuous
Casing Type:	NA NA	-						Diameter:	NA Length NA	NA	NA Hole Diameter:	Depth to Liquid:
Screen Type:	NA			Slot: N	IA			Diameter:	Length NA		Total Depth:	Depth to Water:
Penetration Resistance	Moisture	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		Lithology/Re	emarks	Well Completion
	Dry	0.2	No		0 1 2 3 4 5 6 7		3	\$P5m	Reddish B No S	rown sa 10	ud w/silt	
)ry	0.1	No No		8 9 10 11 12	-	3'	spem	SAA No -Lt. gray. M No slo	ed sand	w/silt	
)ry	0.0	No		13 14 15	-	3	SP/SM ML	SAA. Brown sandy	No 5/6 silt, some	0X. No 5/0	+ + +

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	,	_		_				Boring/Well #	BH-19	
				ng "Reme	ediation			Project:	OH Randel #5	
	LT Envi	ronme	ntai, ind	-				Project # Date	4/24/2017	
	1		-++				<u> </u>	Liaic	1/21/201/	· · · ·
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
Dry Dry Dry Dry Dry	0.4	No No	58 BH 19 335	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			ML	SAA. No Tan, H. Brown + sand. No st xylenes odur.	t silty sand. = s/o t gray med - coarse ain, slight gas. anish gray med-coar i, slight sweet gos	

Î N						Compliance "E LT Environme 848 E. 2nd Av Durango, Col LOG/MONITORING	ve orado 81301	
	BH-20				g/Well Nun	nber:	Project:	
	•			Date:		BH-20	OH Ran Project Number:	
	And the		and the	Logge		8/21/2017	12916 Drilled By:	
Elevation:	Detector:	A LEAR WALL AND A	A STATE	Drillin	g Method:		GEON Sampling Method:	
6,424' Gravel Pack:		PID		Seal:	Но	ollowstem Auger	Continuous / 2 Grout:	Split-Spoon
NA Casing Type:				Diame	NA eter:	Length:	NA Hole Diameter:	Depth to Liquid:
NA Screen Type:	S	llot:		Diame	NA	NA Length:	6.25-inch Total Depth:	NA Depth to Water:
NA		NA		Diank	NA	NA	80-feet	NA
Penetration Resistance Moisture Content	Vapor (ppm) Staining	* Depth (ft. bgs.)	Sample Run	Recovery Soil/Rock	Type	Lithology/F	Remarks	Well Completion
Moist Moist Moist Moist 2	0.5 1.5 1.5 219.3 390.6	0 1 1 2 3 4 5 6 7 8 9 10 11 1 12 13 14 15		M	L Sili M M	<u>t w/ Sand</u> , loose, redish sticity, moist, cohesive, ined sand, no odor <u>ty Sand</u> , loose, lt. brow sticity, moist, sl. cohesi d grained sand, sl. HC o ard, dk lt. brown	95% silt, 5% f. m - lt. gray, low .ve, 65% silt, 35% f	

								Boring/Well # BH-20			
IT		Complian			g 🛛 Reme	diation			Project:	12916007	
	<u> </u>	LT Enviro	onment	tal, Inc.					Project # Date	OH Randel #5 8/21/2017	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		blogy/Remarks	Well Completion
	Dry	271.1			15 16 17 18 19 20	- - - -			- sl. HC odor	-	
	Dry	1,813		BH20 @ 20-25 1010	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$					e, dk. brown - lt. brown, low 20% f. grained sand,	- - - - - - - - - - -
	Dry	1,481		BH20 @ 25-30 1030	27 28 29 30	- - - - -		ML		-	+ + + + + +
	Dry	879.1		BH20 @ 30-35 1050	31 32 33 34 35 36 37	- - - - - - - - - - - -			- introduce water to further drilling	prevent ceasing and allow	

)						Boring/Well # BH-20			
	Compliar	nce " Fni	aineerin	a "Reme	diation			Project:	12916007	
Ĺ	LT Envir							Project #	OH Randel #5	
			,					Date	8/21/2017	
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completic
				37						
Dry	935.6		BH20 @ 35-40 1105	38 39 40	+ +- + +-				- - - -	+ + + +
Dry	733.4		BH20 @ 40-45 1125	41 42 43 44					-	+ + + + + + + +
Dry	1,455		BH20 @ 45-47 0900 BH20 @	45 46 47 48	+ + + + +		ML		<u>8/21/2017</u> <u>8/22/2017</u>	* + + + + +
			47-49 0900	49	+				-	+ +
Dry	736.3			50	ţ				-	İ.
Dry	988.4			51	-				-	+
Dry			BH20 @ 51-55 1025	52 53 54 55 56 57 58 59					-	
17)					Boring/Well #	BH-20			
	C	.		a Domo	diation	Project:	12916007			

Compliance "Engineering "Remediation LT Environmental, Inc.

Boring/Well #	BH-20
Project:	12916007
Project #	OH Randel #5
Date	8/21/2017
	1

	Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
						60					
						61	-				+
					BH20	-				-	+
		Dry	519.5		@ 60-65	62				- small lens of black staining	$\frac{1}{2}$
⊩					1100	63				-	+
E			I TT			64	+				+
			LTE 575.1			65	-		ML	8/22/2017	<u>+</u>
F			1,300 XTO			66	-		IVIL	9/6/2017	Ŧ
E			MIO			_				-	+
Ŀ						67	H			-	t l
╟						68				-	+
F			LTE			69	+				‡
			1,100			70	-				
⊩			2,711 XTO			71	-			Clayey Sand , loose, lt. brown, 70% fcoarse grained sand, 30% fines, plastic, cohesive	+
						72				- split-spoon every 5-feet due to lithology	$\frac{1}{2}$
Ŀ						-	+			hardness	+
┠						73				- Use water to allow deeper drilling through hard lithology	+
F			LTE			74				-	$\frac{1}{2}$
E			849.0			75			SC		+
ŀ			2,298 XTO			76	<u>+</u>				<u>t</u>
╟						77	$\left \right $				+
┠						78	†				†
ŀ			LTE				₽				+
╟			1,044 1,943			79	H				+
			XTO			80	<u>† </u>				<u>† </u>
╟						81	+			TD @ 80'	+
┠						82	T I				Ŧ l
Ľ					1	02	11		<u> </u>	L	L]

N					ないであるという			LT Ei 848 Durd	nvironme E. 2nd Av Ingo, Col	ingineering ∝ Remed ental, Inc. ve orado 81301 WELL COMPLET	
	A CONTRACTOR	BH-21	and the second s			BORIN Boring/Wel			OKING	Project:	ndel #5
	E.	0			and a second	Logged By:		8/21/2017		Drilled By:	6007
Elevation: 6,424'		Detector: Mini	Rae Lite	PID		Drilling Me	thod:	ael A. Wic		Sampling Method:	MAT 2' Split Spoon
Gravel Pack: NA							NA		2	Grout: NA	
Casing Type: NA Screen Type:		Slot:				Diameter:	NA	Length:	NA	Hole Diameter: 6.2-inch	Depth to Liquid: NA Depth to Water:
NA			NA			1	NA	Length:	NA	Total Depth: 40-feet	NA
Penetration Resistance Moisture Content	Vapor (ppm)	Staining Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		L	ithology/F	Remarks	Well Completion
Sl. Moist Sl. Moist Sl. Moist Sl. Moist	16.8 43.8 2,523	BH-2 @ 10-15 1300	13			ML	35% plasti	fmed. gra city, cohesi <u>Sand</u> , m. d	ined sand, ve, ense, lt. b	n brown, 65% silt, sl. Moist, non-low rown, 75% silt, 25% plastic, non-cohesive	

								Boring/Well #	BH-21	
Į Ť=	Comn	oliance " En	aineerin	a "Reme	diation			Project:	12916007	
<u> </u>		nvironmen						Project #	OH Randel #5	
								Date	8/21/2017	
Penetration Resistance Moisture	Vapor (,,,,,,)	(ppm) Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
Dı	-y 1,90)1	BH-21 @ 15-20 1255	15 16 17 18 19					, dk. brown - lt. brown, 80% sand, non-cohesive, non-	
	y 1,63	8	BH-21 @ 20-25 1305	20 21 22 23 24 25			ML	Silty Sand med de	- - - - - - - - - - - - - - - - - - -	
	ry 1,25	59	BH-21 @ 25-30 1310	26 27 28 29 30			ML	med grained sand, 6 cohesive, sl. HC Od auger ceasing	55% silt, high plasticity, lor, water used to prevent	
	ry 624.		BH-21 @ 30-35 1325	31 32 33 34 35 36 37			SW	brown, 65% fcoars	, lt. brown, loose, lt-dark se grained sand, 35% silt, . HC Odor, water used to	

		1						Boring/Well #				
1		Complia	nce E.	nainearir	a Dom	diation			Project:			
L						aution				Project # OH Randel #5		
		LT Envir	onmei	ital, Inc	•				Date	8/21/2017		
1 0	1								Date	0/21/2017		
Resistance	Moisture Content)) or	Staining	Sample #	Depth	Sample	Recovery	Soil/Rock Type			Well	
ista	ist inté	Vapor (ppm)	ini	lqn	(ft.	Run	20V	oil/Roc Type	Litho	ology/Remarks	Completie	
kes.	ŬΨ	C C	Sté	Sar	bgs.)	Kull	Rec	Soi T			Completio	
, Ľ	-				37			•1				
					31				Weathered Sandat	tone, lt. brown, non-		
	1			BH-21	38	+			plastic/non-cohesiv		╉	
	1	350.6		@	50				plastic/non-conesiv	-	+	
	1	350.0		35-40	39						ł	
	1			1355	39					-	┢╴	
	1				40						ł	
					-+0							
	1				41	+			,	TD @ 40'	ŧ	
	1				-71	H I					┢	
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	4				32	H				-	┢	
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	4				54	H				-	+	
	4				55	+					┢	
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	1				57	tl					t	
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	1				59	tl I				t		
	•											
									Boring/Well #	BH-21		
/1	Ţ/	Complia	nce _M Er	ngineerin	ng _M Reme	diation			Project:	12916007		
		LT Envir							Project #	OH Randel #5		
				-					Date	8/21/2017		

Date

8/21/2017

Î N				Sold States			The second s	Ľ	Íz	LT Environm 848 E. 2nd A Durango, Co	ve Iorado 81301	
	1 Aure	E	8H-22 0				ないない	Boring/Wel Date:	l Number		Project Number: 129	ION DIAGRAM andel #5 16007
Elevation: Gravel Pac	6,424'		Detector:	Mini I	Rae Lite	PID	1	Logged By: Drilling Me Seal:	Mich	ael A. Wicker owstem Auger	Sampling Method:	DMAT 2' Split Spoon
Casing Typ Screen Typ	NA ne: NA ne:			Slot:				Diameter:	NA NA	Length: NA Length:	NA Hole Diameter: 6.25-inch Total Depth:	Depth to Liquid: NA Depth to Water:
Penetration Resistance	Moisture Content V	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	NA	NA Lithology/	42-feet Remarks	NA Well Completion
	Sl. Moist	22.1			0 1 2 3 4 5 6 7 8 9			ML		7 <u>/Sand</u> , loose, brow grained sand , 75%		
	Sl. Moist	2.4			10 11 12 13 14 15			SM	-		k. Brown, 30% fmed igh plasticity, cohesiv	

							Boring/Well # BH-22					
11		Complian	ce " End	nineerind	n "Reme	diation			Project:	-		
Ŀ	-	LT Envire			,				Project #	OH Randel #5		
				,					Date	8/21/2017		
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completion	
					15					e, lt. brown-gray, med.		
					16 17	-			Plasticity, sl. Moist, med grained sand - Low recovery, swit	cohesive, 80% silt, 20% f	-	
	Sl. Moist	0.0			18 19	-		SM		-	-	
					20	-				-reddish, , 80% silt, 20% f	-	
	Dry	0.0			21 22	-				w-med plasticity, cohesive grained sand, non-plastic,	- -	
	Dry	0.0		BH-22	23 24			ML	non-cohesive		- - -	
	Dry	1,523		@ 24-26 1505	25 26	-				-	- - -	
	Dry	1,493		BH-22 @ 26-28 1315	27 28	-				-	- - -	
	Dry	1,183		BH-22 @ 28-30 1325	29 30	-				own-reddish, loose, 80% ined sand, low-med non- e, slmod HC odor	- - -	
	Dry	814.2		BH-22 @ 30-32 1335	31	-					- - -	
				1335 BH-22	32 33 34	- - -				med. Dense, lt. brown, ed sand, 5% silt, non- e, HC odor	- - -	
	Dry	1,047		@ 32-37 1550	35 36	- - -		SW		- - -	- - -	
					37	-				-	-	

_							Boring/Well # BH-22				
ľĹ.	-/	Complian	CO E	nincorie	n Pama	diation			Project:	12916007	
					у ∞ кете	uiution			Project #	OH Randel #5	
		LT Enviro	onmen	ιαι, inc.					Date	8/21/2017	
o ۵									Date	0/21/2017	1
Moisture	Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completio
					37	ili –					
									Weathered Sandston	ne, hard, lt. brown-reddish,	
					38				fmed grained sand,	, non-plastic/non-cohesive,	
					-						ļ
				BH-22	39					-	L.
		304.7		@		-1					+
				37-42	40					-	+
				1610	41	$\left \right $					+
					41 -					-	┢
					42						ŧ
Ì											
					43	tl 🛛			1	TD @ 42'	Ĺ
						LI					Ļ
					44 _	Ц				-	∔
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					45	H				-	╞
					46	+I					ł
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					59		1		1		
				BH-21							
		Complian	ce _M Eng	gineering	g _M Reme	diation			Boring/Well # Project:	12916007	
		LT Enviro							Project #	OH Randel #5	
									Date	8/21/2017	

		Boring/Well #	BH-21
T=/	Compliance 🛛 Engineering 🖉 Remediation	Project:	12916007
	LT Environmental, Inc.	Project #	OH Randel #5
		Date	8/21/2017

N							A STATE OF A	E		LT Environm 848 E. 2nd A Durango, Co		
		BH-	23	- A - A				Boring/Wel Date: Logged By:	ll Number		Project: OH Ra Project Number: 1291 Drilled By:	ndel #5 6007 MAT
Elevation: Gravel Pac	6,424' ^{k:}		Detector:	Mini l	Rae Lite	PID		Drilling Me Seal:	thod:	owstem Auger	Sampling Method: Continuous / Grout:	2' Split Spoon
Casing Typ	NA			Slot:				Diameter:	NA NA	Length: NA Length:	NA Hole Diameter: 6.25-inch Total Depth:	Depth to Liquid: NA Depth to Water:
Penetration Resistance	Moisture VN Content V	Vapor (ppm)	Staining		Depth (ft. bgs.)	Sample Run	Recovery		NA	NA Lithology/	40-feet	NA Well Completion
	Sl. Moist	149.7			0 1 2 3 4 5 6 7 8 9			ML		/ /Sand , loose, brown grained sand , 75%		
	S1. Moist	4.1			10 11 12 13 14 15			SM	-		s. Brown, 30% fmed gh plasticity, cohesive	

LT Environmental, Inc.	12916007 DH Randel #5
Date	DH Randel #5
Lithology/Remarks	8/22/2017
	Well Completion
15 - lt. brown-gray, med. plasticity,	
	+
SI. 5.3 Moist 18 SM	
	+
21 22 Sl. 5.5 Silt w/ Sand, lt. brown, dense, 75% sil	lt, 25% f.
Moist 23 grained sand, non-plastic, non-cohesive 24 24	
25 ML 26 M	
Dry 154.8 27	30% f
29 med. grained sand, 70% silt, non-plastic cohesive, HC odor 30 30	ic, non-
BH-23 31	
Dry 246.9 @ 32 -sl. Odor SM -sl. Odor	
	+ + +

									Boring/Well #	BH-23	
LΤ					g _M Reme	diation			Project:	12916007	
	· - L	T Enviro	onmen	tal, Inc.					Project #	OH Randel #5	
									Date	8/22/2017	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					37						
		349.2		BH-23 @ 35-40 1325	38 39 40					-	
					41 42 43 44					TD @ 40'	
					45 46 47 48	- - - - -				-	+ + + + + + +
					49 50 51 52	+ + + + + + + + + + + +				-	+ + + + + + + + +
					53 54 55 56 57					-	
					58 59	-					+ + •

î N								Ľ	Ē	LT Environn 848 E. 2nd A	•	diation
	and the seal	10 14			-	1.10	St.			MONITORIN	G WELL COMPLE	FION DIAGRAM
	1	T	A in	1	and the	1	1.1	Boring/Wel		H-24	Project: OH R	andel #5
		O BH-	24	-	1		N.	Date:			Project Number:	
		A		A A				Logged By:		2/2017	Drilled By:	016007
an are			Datastan	and in the		· Martin	5	D 'II' M		A. Wicker		OMAT
Elevation:	6,424'		Detector:	Mini F	Rae Lite l	PID		Drilling Me		tem Auger	Sampling Method:	tinuous
Gravel Pack	k: NA							Seal:	NA		Grout: NA	
Casing Typ	e:							Diameter:		Length: N A	Hole Diameter:	Depth to Liquid:
Screen Typ				Slot:				Diameter:	NA	NA Length:	6.25-inch Total Depth:	NA Depth to Water:
	NA	<u> </u>		N	А			1	NA	NA	45-feet	NA
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		Lithology	/Remarks	Well Completion
	Moist Sl. Moist	3.6 709.3		BH-24 @ 5-10 1440	0 1 2 3 4 5 6 7 8 9 10			ML	- Staining	g @ 9.5' (gray-c	vn-reddish, 20% f , silt lk. gray), strong HC lk. Brown, 25% fme	
	Dry	1,475		BH-24 @ 10-15 1450	11 12 13 14 15			SM			lk. Brown, 25% fme	

ĹĹ		Complian LT Enviro			g " Reme	diation			Boring/Well # Project: Project # Date	BH-24 12916007 OH Randel #5 8/22/2017	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		ology/Remarks	Well Completion
	Dry	1,331		BH-24 @ 10-15 1452	16 17 18 19				- end of gray stainin plactic, non-cohesiv	ng, v. dense, dk. brown, non- re -	-
	Dry	1,445		BH-24 @ 10-15 1455	20 21 22 23 24 25	-				-	
	Dry	1,214		BH-24 @ 10-15 1505	28 29	-		SM	- brown	- - -	
	Dry	1,190		BH-24 @ 30-35 1320	30	- - - - - - - - -			- lt brown	-	
					36 37	-				-	+ + +

									Boring/Well #	BH-24	
		Complian			g _M Reme	diation			Project:	12916007	
Ċ	_	LT Enviro	onmen	tal, Inc.					Project #	OH Randel #5	
						1			Date	8/22/2017	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
Η					37						
					57				- lt. brown - lt. gray	7	
				BH-24	38				n. biowii n. giuy	· · · · ·	+
	Dry	445.1		@						-	-
	5			35-40	39						†
				1530	_					-	-
					40						
					-				- lt. brown		
					41	Ц				_	L I
				BH-23		LI					L I
				@	42	Ц I				-	↓
	Dry	357.4		40-45		-					- 1
				1550	43	H				-	-
					44	-					-
					44 -	H				-	- 1
					45	-					-
					43						
					46	+				TD @ 45'	-
					40 -					ID @ +5	-
					47						-
					-					-	-
					48						
					49					-	
					-						-
					50					-	-
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					39				l		I]

Location	Map:						Compliance « Engineering « Remediation LT Environmental, Inc. 4600 W. 60th Avenue Arvada, Colorado 80003 BORING LOG/MONITORING WELL COMPLETION DIAGRAM				
						1	BORIN Boring/Well	Number	Project:	N DIAGRAM	
							BH25 OH Randel #5				
								9-28-17	0129160	007	
							Logged By:	Daniel Burns	Drilled By: Enviro-D	Drill	
Elevation:	1 11 TO 11		Detector:	Р	ID		Drilling Meth		Sampling Method: Contra	nuous	
Gravel Pack							Seal:		Grout: NA		
Casing Typ	ilica Sar	nd					Bentonit	Length:	and my	Depth to Liquid:	
Sch 40				Slot:			2" Diameter:	Length:	Hole Diameter: <u>4.25</u> " 7.25" Total Depth: 5.3	Depth to Water:	
Sch 40				0.010"			2"		So		
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Re	emarks	Well Completion	
	Dry	0.6		Not enough Mucterite fur Sampts	4	O Recov.	nr	Road base Loam Brown FM Sand No Recovery, lon stuck in shoe p ony material from e Brownsandy silt. N Lt gray, w/ oxidiz. W No s/o	w/silt. No ge cobble revented mering sample ban to slo	+ + + + + + + + + + + + + + + + + + +	
	Dry	2.1	N=		12 14	- 3' reca	5.	Lt gray w/ oxidiz. W No 3/0 SAA, but w/ slig	red. silty sand		
	Dry	0.5	NÞ		16 18 20	- 3' Reco	J.	Brownish gray savdy s	sr册, No slo		
	Dry	1-8	Nə		22 24 26	4' Heco	v.	Dark brown Fn. slighty consolidated No 3/0 Brownish tan sou	, dense.		
	Dry	2.3	No		28 30	3' Rcco	N	- Lt grow/ton silty - soundy silt.		<u>+</u>	

1.00

Contraction of the second second

183.5

Locatio	on Map:											
			3				Ľ	Compliance " E LT Environme 4600 W. 60th Arvada, Color	Avenue	ediation		
							BORI	BORING LOG/MONITORING WELL COMPLETION				
							Boring/Wel	Number: BH25	Project:			
							Date:	9-28-17	OH Rando Project Number:			
							Logged By:		0129160 Drilled By:	007		
Elevation	:		Detector:				Drilling Me		Enviro-D	Drill		
Gravel Pa					PID		Seal:	Hollow-Stem Auger	Split Spo	oon		
Casing Ty		ind					Bentoni Diameter:		NA			
Sch 40 Screen Ty				Slot:			2"	Length:	Hole Diameter: 7.25'	Depth to Liquid:		
Sch 40				0.010"			Diameter: 2"	Length:	Total Depth: 50	Depth to Water:		
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Rer	•	Well Completion		
	Dry	112	No	Bt1 25 © 30-35	3 0 1 3 2 3 4 3 6	S' Recov.		Lt. gravition brown sound. Staghty cem stain, v. stt. sweet Lt gray/tan silty sittly consolidated, N v. stt. sweet odor.	silty Fn. ented. No t degraded HC odor:	-		
	Dry	26.2	No	35-40	3 8 4 0	- - -		Et gray I tan sitty sitty consolidated, N v. stt. sweet odor.	io stolu.	-		
	Dry	2.5	No	40-45'	リ2 _ 444 _	-		Lt. tan silty me No stain/odor.	-	+ 		
	Dry	8.9	Νu	¥s- \$ 0	46 48 5 0 5 2	-		SAA. No s/	- 0			
					3 4 3 6 3 8 6 0							

South Balling and

10 mile

location	Map:									
							Ľ	4600 W. 60	["] Engineering _" Ren mental, Inc. th Avenue lorado 80003	nediation
							BORI	NG LOG/MONITORING		ON DIAGRAM
							Boring/Wel	BH26	Project: OH Ran	del #5
							Date:	9-29-17	Project Number: 01291	6007
							Logged By:	Daniel Burns	Drilled By: Enviro	-Drill
Elevation:			Detector:	I	PID		Drilling Me	thod: Hollow-Stem Auger	Sampling Method: Split S	
Gravel Pac 10-20 S	^{k:} Silica Sai	nd					Seal: Bentoni	2	Grout:	
Casing Typ Sch 40	be:						Diameter: 2"	Length:	Hole Diameter: 7.25	
Screen Typ Sch 40	e:			Slot: 0.010"			Diameter:	Length:	Total Depth:	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock	Lithology/I	Remarks	Well Completion
	Mojst	0.6	NÒ			3		Roadbase, F brown silty sam Lt. Brown silty n - Lt. ton sitly fn	the dert	+ + + + + + + + + + + + + + + + + + + +
	dry	0.0	Nð	6	6 8 	5'				+ + +
1	Dry	0,0	No	23	12 14	- - - -		ton med som N -slight oxidation le	0 5/0	+ + + +
	Dry	0.0	No	-	16 18 20	4'		Brownish gray silt	y fn send slo	+ + +
	Dry	0.0	No		22 24	5'		Lt. Brown fin some comentat No s/o	fon	+
	the	•	No		26 28 30	1'	-	-Dense, consdidated - cemented rock. N Impermeable.	d s. stn. to stain/odor.	+

sation N	Мар:									
		ĸ					Ľ	4600 W. 60	e "Engineering "Ren nmental, Inc. Oth Avenue plorado 80003	mediation
							BORI	NG LOG/MONITORING	G WELL COMPLETI	ON DIAGRAM
							Boring/Wel	Number: BH27	Project: OH Rar	
							Date:	9-29-17	Project Number: 01291	
							Logged By:		Drilled By:	
Elevation:			Detector:		PID		Drilling Me	thod:	Enviro Sampling Method:	
Gravel Pac 10-20 S							Seal:	Hollow-Stem Auger	Grout:	poon
Casing Typ	e:	10					Bentoni Diameter:	Length:	Hole Diameter:	
Screen Typ	e:			Slot:			2" Diameter:	Length:	Hole Diameter: 7.25 Total Depth:	Depth to Water:
Sch 40	PVC			0.010"			2"			Sopulie Huler.
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/		Well Completion
	Dry	0.0	No		0	2'		Topsoil, Brown fn-med. silty No s/o Brown fn-med No s/o	rish red ttan sand.	+ + + + + + + + + + + + + + + + + + + +
	Dry	0.0	No		6 8 10	4'		Brown fin-med No s/d	silly sand	+ +
	Dry	0.0	N,		12 14	3'		No S/O SAA - Light gruyish be silt: SHly. commente	rown fn. sondy d. Noslo	
	Dry	0.0	NG		16 18 20	2'		SAA Lit Brown for E Silt. No s/o	Soundy	+ + + + + + + + + + + + + + + + + + + +
	Dry	0.0	No		22 24	3'		SAA. No stain/oc	(อ(+ - - -
	Dry	20.5	N.		26 28 30	3'		-Lt. gruy/tan s Mastain, V. slt. s	silty med. sam	1

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lioi	n Map:									
							1	4600 W. 60	s Engineering Ren mental, Inc. Th Avenue lorado 80003	nediation
							BOR	ING LOG/MONITORING		ONDIACDAM
							Boring/W	BH27	Project:	
							Date:	9-30-17	OH Ran Project Number:	
							Logged By	/:	Drilled By:	5007
Elevation:			Detector		PID		Drilling M		Enviro- Sampling Method:	Drill
Gravel Pa	^{ck:} Silica Sa	and			FID		Seal:	Hollow-Stem Auger	Grout:	oon
Casing Ty	pe:	anu					Benton Diameter:	Length:	NA	
creen Typ	pe:			Slot:			2"		Hole Diameter: 4.25" 7.25	Depth to Liquid:
ch 40	PVC		1	0.010"			Diameter: 2"	Length:	Total Depth: 50'	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/R		Well Completion
	Dry	59.6	Na		3 0 3 2 3 4	3'		Ll-gray than silty No starn, sit. swe -6" lense of the gray - 4t-gray tan silty m	med sand. et HC odor 1 sandy sillista. red. sand	 - - -
	Dry	3,454	Nə	BH 27 @ 35-40	36 38 40	41		Lt grav/tun # w/silt. No sta degrading HC odor.	med, sand.	
	Dry	1,947		BH 27 E 40-45'	4 + +	2		SAA, No stain, mo	-	
	Dry	832	N6	81127 Q 45 So'	_ § 0	2'		SAA. No shown, It. oder . It growish brown silty - sampler shoe fell hole, unable to g	Firs.stu. mod. deuse Firs.stu. consolidated	-
					\$2 \$4 \$6 \$8 \$8 \$0	-		still collect sampl	les -	-

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No.

Casing Typ Sche Screen Typ	0 Silica e: dule 40 e:	PVC	Detector:	Slot:	PID		A STATE OF A	Boring/Well Date: Logged By: Drilling Me Seal: Diameter:	$\frac{BH-2.8}{12/17/18}$ Eric Carroll	rado 81301	del #5 8016 ne
	dule 40	1	c.j		10"				2"		MA
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Ren	narks	Well Completion
	ηρίζε	34.4	NO		0 1 2 3 4 5 6 7 8 9	BH-28 0-10'		SM	Dark reddish brown No Stainrodor	Silby Sand	NO Well instand
	Moise	2.5	NO		9 10 11 12 13 14 15			CL	Firm, grey/brown, s no stain/odor		

)						Boring/Well #	BH+28	BH-28
	2	Adv	anci	ng Op	oporti	INİ	ity	Project: Project #	OH Randel #5 017818016	
E e o			#			~	~	Date	12/17/18	
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
		NO	Sample #				CL SP- SM	SAA NO Firm, yellow < 40% Sand No Sta Dense, It rea Dense, It rea	Stain / odor brown, Sandy clay no Stain / odor Idisn brown Sand, in Silt < 10%	
				36 37	-					-

R

								Boring/Well #	BH- 28	
	-	Ad	innoi	ing O _l	nort	(m)	it.	Project:	OH Randel #5	
A	2	AU	anci	ng Op	ρυπ		ily	Project #	017818016	
E el o	Ĩ	Î.	I	r 1	r i	5		Date	12/19/18	T
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
				37						
Dry		Ne		38 39	-			white, grey b < 25%	prown Sand W/Silt	
				40	-				ja a	-
Dry		NO		42 43	-			SAA	3 >	
				44 45 46					3	
Dry	1 705 12.5	N		40 47 48	-			SAA		
				49 50						
Dry		NP		51 52 53	-			SAA		
				54 55					- - - 	+
				56 57					-	
				58 _ 59 _					-	

									Boring/Well #	BH - 28	
	h -		Adu/	oncir	ig Opp	ortur	it.	,	Project:	OH Randel #5	
1		4	Auva		y opp	Joi tui	шу		Project #	017818016	
C		-				g a	n vi		Date	12/19/14	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Lithe	ology/Remarks	Well Completion
					60						
	Dry		NO		61 62	-			SAA	NO Stainfodor	-
					63	-				-	-
					64 - 65 -	-				-	-
					66 67	-					
					68 69	-				-	
					70 _	-					-
					72	-			×	V_	
					73 74	-				-	-
					75 76	-				-	
					77	-				-	-
					78 _ 79 _	-			E DOVE - LOVE	CION track	-
					80 81	-				CIAY trale	
	Dry	7.7	NC		82				BH = 85	1	

Casing Typ Sche Screen Typ) Silica e: dule 40	PVC	Detector:	Slot:	PID		and the second se	Boring/Wel Date: Logged By: Drilling Me Seal: Diameter: Diameter:	BH - 29 12/17/18 Eric Carroll thod: Sonic MA Length: 2'' Length:	e orado 81301	lel #5 016 e arrel Depth to Liquid: MM Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	2" Lithology/Re		Well Completion
	moisr	0.4	NO		0 1 2 3 4 5 6 7 8 9				Dark reddish brow 230% silt no s Dance Firm Yellow brow 230% clay trace No Stain/Odor	n, Claycy Sand Silt	NO Well installed
	noise	1.0	No	BH-29 10-15'	10 11 12 13 14 15			5M 5C	Dense, Rust, Sand t Interbadad Clay Donse Firm, Yellow brown, C < 40% Clay		

	_		>						Boring/Well #	BH-29	
	KT I	=/	Adv	anci	ing Op	nniti	m	itv	Project:	OH Randel #5	
		-	101	unor	ng op	porte		cy.	Project #	017818016	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)		Recovery	Soil/Rock Type	Date	12/17/18 Dogy/Remarks	Well Completion
					15		-				
	Moi5€	Ò.O	NΟ		16 17 18 19	- - - -		SC	Dense, It. bi 230% cray, motbling < 1	rown, Clayey Sand - 5000 platy rust 5000 thick	-
	ηοίςε	0.0	Ne		20 21 22 23	-		sc SP	toose, Sand Qu		
	Maise	0- Ŭ	Ne		24 25 26 27			5C	2/22	Corey, Sand trace	-
	Dry	0.8	NP		28 29 30 31 32	BH-79 27-32'		50	no sea Donse, white	c, Sand tracc interbedded grey	
					33 34 35 36 37	BH			TD = 32	1	-

Elevation: 6,423 Gravel Pack: 10-20 Silica Casing Type: Schedule 40 Screen Type:	Sand	Detector:	Blot:	PID		A State State State State	Boring/Wei Date: Logged By Drilling Me Seal: Diameter:	BH-31 12/16/18 - 12-17-18 Eric Carroll /Ssh Au	rado 81301 ELL COMPLETIC Project: OH Rance Project Number: 017818	lel #5 016 e
Schedule 40				10"	1			2"		Deputito water:
Penetration Resistance Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Ren	narks	Well Completion
₩QÌ5₺	0.5	No		0 1 2 3 - 4 - 5 - 6 - 7 - 8 - 9 - 9				Dark reddish brou Sandy < 15% Si No Stain,	vn, Silby 16 Vedar	
 DRY	548	NO		10 11 12 13 14 15				Dense, It reddish b Gome Silb/Clay <1 NO Staining,	5% fines	

		>						Boring/Well #	BH~ 31	
	-	Adv	vanci	ng Or	oporti	Ini	ity	Project: Project #	OH Randel #5 017818016	
				U 1	*			Date	12/16/18	
Penetration Resistance Moisture	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
Dry		No	BH-31 20-25' San	(ff. bgs.) 15 16 17 18 19 20 21 22 23 24 25 -		Rec	Soil	Some Sand <1 Dense, white Gilt < 15% Strong odo FIRM, Yellow	n brown Clay 15%, Slight Odar elgrey Sand Some ng Stain Strong r brown, Sandy Clay no Stain, Strong	
Dry	, 2018 1776			26 27 28 29 30 31 32 33 34 35 36 37	BH-31 30-33				5 -	

Ç

						Boring/Well #	21/21	
	Adu	ancing O	nnort	un	it.	Project:	BH ~ 37 OH Randel #5	
	101	anong Of	υρυτι		цy	Project #		
H e l	310 1				_	Date	017818016	A 11
atio anc ont or		#			×		12/18/18 -12	- 17-18
Penetration Resistance Moisture Content	(ppm) Staining	Depth (ft. bgs.)		Recover	Soil/Rock Type	Litholo	ogy/Remarks	Well Completio
		37	4	-		14 <u>.</u>		
Dry 380	NO	38				Dense, White/2 Silt 2 3070	prey, Sand Some	90 50
		39				no stain,	Strong adat	6
		40 I					+	
		41					1	9
		42				SAA No Stai	n, strong odor	
DRY 360	NO	43	3				ŧ	
		44					ŧ	
	-	45					ŧ	
		46				SAA. no CHA	in, Strong odor	
Dry 348	NO	47				504	T	
	ey c	48					Ŧ	
		49					Ŧ	
		50						
		51					‡	
		1 1					‡	
		52			C	AA, no stain,	Strongodor	
Dry 343	NO	53				. /		
		54					+	
		55				10.105	_, . .	
	NO	56		SN		Stopped @ 5 resume 12-19	- †	
		57		-		white/grev/br	an saidstant	
- Dry 209	NO	58 57	RE	SM		<25% 5.1+	aun sandstonet, strong HCodar A Sandston	
		59	2			mostly solic	A Sandston +	
						P"	T	

Boring/Well # BH=3 OH Randel #5 Project: Advancing Opportunity 017818016 Project # 12-14-18 Date Penetration Resistance Soil/Rock Type Sample # Moisture Content Staining Depth Sample And Sample (ft. bgs.) Run Vapor (ppm) Well Lithology/Remarks (ft. bgs.) Completion 60 dry 333 NO SAA strong o dor SM 61 57-13 62 25Ð ND SAA M 63 SAA 64 2483 NO der 65 SM SAA 66 57-68 fri WO 1673 67 SAA SM dr 2013 57-68 WO 68 SAA 68.11 69 dn 624 NO SM 70 SAA 68-27 SM 71 NO kry 1373 72 SAA, some black staining 8-17 73 2352 Yes day SM 74 SAA 75 8-77 ly Yes 1546 SM 76 SAA 65-77 SM day (679 yes 77 222 77-83 78 SM SAA 1574 Yes 1rl 79 2 80 Sand u/ silt = 25% more 7783 dry 2165 81 Y95 fines than above, light gray stain Header Ž 82

The Same

Boring/Well # BA-31 Advancing Opportunity Project: OH Randel #5 Project # 017818016 Date Penetration Resistance 12-19-18 Moisture Content Staining Sample # Vapor (ppm) Soil/Rock Recovery Depth Sample (ft. bgs.) Lithology/Remarks Well Run Completion dr 182 83 7783 SM SAA heavy black to rey skin 23-8 包括中 1277 84 \$ SAIL no Stain LΛ SA 85 light grey sandu/sill increased lines = 3 glo Slight-odor light grey sandy silt. almost clay no odor or stain 514.4 86 der N SM 3-87 87 88 27-K 1A 13.9 89 NJ 90 - 30⁴ N dry 87-2 91 SAA 12.4 92 Ari 4.8 93 87-4 SAA SAA TD C 96 \mathcal{N} 94 BH-31 7.2 87.20 day N 95 94-96 1120 96 97 98 99 100 101 4 5 102 103 3 104 ġ. 105

			- "hels				2		×		e *	
Elevation Gravel P 10- Casing T	6,423 ^{Pack:} -20 Silica		Refut Sources		PID		「「「「「「「「「」」」」	Borin Date Logg Drilli Seal:	ed By:	Eric Carroll thod: Sonic	e prado 81301 VELL COMPLETI Project: OH Rar Project Number: 01781 Drilled By: Lay Sampling Method: Core F Grout:	ndel #5 8016 ne Barrel
	hedule 40	PVC		Slot:				Diam Diam		Length: 2"	Hole Diameter:	Depth to Liquid:
Sch	hedule 40		6.		10"		_	T		Length: 2"	Total Depth: <u> </u> ³ ⁷ ¹	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock	Type	Lithology/Re	marks	Well Completion
	Μοίζε	15-1	No	0-10	0 1 2 3 4 5 6 7 8 9			51	У	Dense, Yellow brow Sand 730% find no ødor		NO Well installed
	Dry	0-0	NO	10-15	10 11 12 13 14 15			SP	2	Very Dense, it gi trace silt <590 NO Stain/		- - - - - - - -

5 $= - e^{2}$

			1				_	_	1		
	-		2						Boring/Well #	BH-32	
	611		Adu	anci	na Ni	oporti	in	itv	Project:	OH Randel #	5
		24	/ 10/1	anon		ροπι		ily i	Project #	017818016	
<u> </u>	~		r			1			Date	12/14	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lith	ology/Remarks	Well Completion
	DRY	<i>16-</i> 3	NO	00-51	15 16 17 18 19	5		5P	SAA no	stain/odor	
n =	[noise	0.6		20-25	*20 21 22 23 24			ĊĿ		sh brown Sandycl d Stain/odor	
	moisr	13		35-30	25 26 27 28 29 30		*	ĊĿ	NO 51	K brown Sandy % Sand bain lodor	
	moise	<i>0.1</i>		~	30	4	-	CL"	<15% Sano	, brown, Clay A in/odor	
	Moiss	0.6			35 36 37	-		CL		n sandy clay nd itain/odor	

. .

summer of the second se	1	2	Adv	ranci	ing O	pporte	<u> </u>			Boring/Well # Project: Project # Date			BH-3 OH Randel # 017818016 12/14	5 -	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock	1 ype	I	Litholog	gy/Remarks	3		ion
	moise	11.2	Are		38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58	5		SM		< 30% no 5 34A n	fine Stair 0 St	:5 n/ odo√ ain / 9d0	2~		

								Boring/Well #	BH-32	
		Adva	ancin	a Oni	oortun	iitv	/	Project: Project #	OH Randel #5 017818016	
	1	7 168 8 6	~: <i>\VII</i>	3 ~~~	- wrg (x 640 // 1			Date	12/18/18	
Penetration Resistance Moisture	Vapor (ppm)	Staining	Sample #	Depth	Sample Run	overy	Soil/Rock Type		ology/Remarks	Well
Mo	3 > B	Sta	San	(ft. bgs.)	Kun	Rec	Soil T			Completion
				60						
				61	-			Dense, 15 rea	ldish brown sand. 1090 interbedded	-
Pry	9.8,6	NO		62	ţ		SP	trace Silt C	1070 Inter beauco	1
	101			63	+I			Clay clocm		+
				- 05	H			no stain,	Silght odar	t I
				64	Į					1
				65	ŧ					†
			- m		#					†
				66	H		SP	SAA, no s	stain, slight odar	+
				67	tl		00			1 I
					Ţ					+
Dry	94.3	Ne		68	H					+
				69	1					1 1
				70	ŧ					+
				- '' .		-				+ 1
				71	1		SP	SAA, no sto	nin, stight odor	Į I
				72	+					+
		. cP		12.	Ħ					†
I Un	1 102.2	Nº		73						+
				74	+					+
				· ·	Ţ					T I
				75						+
			25-80	76	t		C MA	Dense, 12 red	dish brown sand	1 I
			is a	^]		JAL	Some Silt e	dish brown, sand 3090, continuiusions	Ţ
			1	77	\mathbb{H}					+
pr	1 108.9		2	78	tl					± l
			I J		Ţ					Ţ
			BH-32	79	+					+
			122V	80	1					1
					Ŧ	1		SAA AAC	min lat	Į
	1 740			81	+		SM	SAA, NO SE	Mri / Odor	+
Dr	y 703			82	†					1
				-						

							_		Boring/Well #	211.20	
	1-1-		Adu				. 14		Project:	BH- 32 OH Randel #5	
		2	AUV	ancir	ig upp	portun	IITY		Project #	017818016	
									Date	12/18/18	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Lith	ology/Remarks	Well Completion
					83	Щ					
	D^Y	64.1	658-1 NP	~~	84 85 86 87 88	• • • • •		SМ	јАА, по	Stain / Odor	
	DrY	10.7	No	~	89 90 91 92 93 94		¢	CL	Very firm, Clay, trac NO Sta	dark grey, e sand < 5% in 1 adar	
	Dry	1.3	Ne	~~	95 96 97 98 99	BH-32 95-100' {		CL	SAA No	Stain/odor	- - - - -
					100 101 102 103 104	BH			TD = 1		
					105						-

Elevation: 6,423 Gravel Pack: 10-20 Silica Sa Casing Type: Schedule 40 PT Screen Type: Schedule 40 PT	VC	PID		- A CONTRACTOR OFTA CONTRACTOR	Boring/Wel Date: Logged By: Drilling Me Seal: Diameter: Diameter:	<u>BH-33</u> 2/13 12018 Eric Carroll	ve Iorado 81301	del #5 8016 ne Barrel Depth to Liquid: MA Depth to Water:
Penetration Resistance Moisture Content	Vapor (ppm) HC Staining?	#	Sample .) Run	Recovery	Soil/Rock Type	Lithology/R		Well Completion
	ν.σ <i>Ν</i> ο	0 1 2 3 4 5 6 7 8 9 10 11			SM	Reddish brown, s ₹ 20% silt, no st		NO Well Installed
Diy 1. moise	6 NP	12 13 14 15	+		SM	lt. yellow brown, 2 30% 5ilt, rust 21" diameter No Stain/odd	mottling	- - - - - -

			>						Boring/Well # Project:	BH - 3 3 OH Randel #5	
	41	2	Adv	ranci	ng Op	porti	INI	ty	Project #	017818016	
e p				-#			2		Date	12/13	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)		Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					15	1				-	
					16	-				-	+
					17	-		SP	Dense, White/	grey, Sand, trace O Stain/odar	±
	maise	2.2	No		18	-			Silt < 1070 No	o Stain/odar -	
					19	-				_	-
					20	·					<u> </u>
					21	-				-	+
					22	-			Firm It brow	n, the sandy clay -	<u>†</u>
	Dry	8.4	NP		23	-		5C	2 30% sand	n, Lla Sandy Clay No Stain/odor	-
					24	-					<u>+</u>
				a	25	•					+
					26	-				-	+
	-				27	-		58	very dense, 9	rey white, sand ogo	-
	Dry	6.2	NO		28	-			no stain		+
					29	-				-	‡
					30					3	+
	•				31	-				-	+
					32	-		17			<u>+</u>
	Dry	1114	Ne		33	-		SP		lish brown, sand	+
					34	0			in Jourda	tor Strong oder	-
				1944 (M. 19	35	35-40				-	+
					36	BH-33		e D	SAR S.	trong odor	-
	Dry	3018	Ne		37	BH-		SP		oring odor	t
							_	_			

									Boring/Well #	Du 23	
	K		Ad	(000)	ina O	nn o rt		ida a	Project:	<u>BH-33</u> OH Randel #	5
1		2	AU	/anci	ing Op	oporti		lly	Project #	017818016	
		1	i i	ĩ	i i	ñ 1			Date	12/13/18	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					37	4					
		48.1 37.0	NP		37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57			CL SP CL	Clay < 1" th	n Slight odor t Odor	
	Dry	83.6	NO		58			SP CL	SAA, Slign	t odos	

ImpletOff-addition whiles, SandTopological in the set of the se	·									Boring/Well #	PH = 7 7	1
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$						0	,	.,				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			_	Adva	ancin	ig Upp	ortun	llty	·	Project #	017818016	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		1	-							Date		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	
Dry 1072 $N0$ 62 63 64 65 64 65 66 67 66 67 66 67 68 69 70 71 72 72 73 74 75 74 75 76 77 75 76 77 75 76 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77 77 76 77						60	Щ					
Dry = 567 NO $Fi = 57 SAA Strong odor$ $Dry = 567 NO $ $Fi = 57 SAA Strong odor$ $Fi = 57 Saddish white, Sand$		Dry	107C	No		62 63	-		SP	Dense, It re trace silt < Strong odo	ddish brown, Sand 1090 Na Stain r	- - - - -
Dry 832 No 72 73 74 75 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 77		Dry	G 67	NO		66			s Sp	544 Stv	rong Odor -	* * * * * * *
Dry 418 77 78 78 78 79 80 81 81 81 81 81 81 81 81 77 77 77 77 77 77 77 77 77 7		Dry	832	Ne		72 73 74			SP	Donse, It rea Coal pieces	ldisn white, Sand <1" diameter	+ + + + + + + + + + + +
		Dry	418			77 _ 78 _ 79 _ 80 _ 81 _	1 0		SP	Dense, It ree trace silt Cil	ldish white, Sand 0 %o -	
						82						

Boring/Well # BH-33 Advancing Opportunity Project: OH Randel #5 Project # 017818016 Date 2 7/18 Penetration Resistance Moisture Content Soil/Rock Type Staining Sample # Depth (ft. bgs.) Run Vapor (ppm) Well Lithology/Remarks (ft. bgs.) Completion 83 Dense, it reddigh brown, sand trace silt < 10% no grain, 84 NP SP 404 Dry Strong odor 85 86 SAA . 87 209 NP Dry 88 89 very firm, dark grey silty clay CL 90 CL brace sile, no stain/odor 91 63.1 92 93 94 95 96 97 SAA no Stain/odor CL 47.3 NO Dry 98 99 100 100-105 101 102 CL SAM No Stainlodor 103 33 DRY 1-6 Ne 104 ÷ TD= 105' 105

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Casing Typ Sche Screen Typ	0 Silica e: dule 40	PVC	Detector:	Slot: 0.0	PID 10"		一、 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、 、	Boring/Wel Date: Logged By: Drilling Me Seal: Diameter: Diameter:	BH-34 12/15/18 Eric Carroll	ve orado 81301	del #5 8016 ne earrel
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Ro		Well Completion
	maist Moist	@ ₁ 0 0.0	NO		0 1 - 2 - 3 3	I I I I I I I I I I I I I I I I I I I		SM SM	Dark red brow No Stainlodo, Dense yellow bro < 3090 silt		NO Well inStalled
	Moist	0,0	NO		7 8 9 10 11 12 13 14 15	2			no Stain/ada Dense It grey/w interbbed W/ cla No stain/odar	hitz Sand	

4.9				2					_	Boring/Well #	RH-34	
0		TTT.		Adv	<i>ianci</i>	ng Op	noorti	Ini	itv	Project:	OH Randel #5	
			6	2 101 2			100.00		-,	Project # Date	017818016	
	Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		ology/Remarks	Well Completion
		moist	0-0		Sar	15 16 17 18 19 20 21 22 23 24 25 26	3		SP CL CL	Clay < 45" Firm, dark 1 < 30% 50M No 5to 100Sc, 1t bro W/grovel NO 5	, Sand, interbedded thick nown, Sandy Clay d nin/Odor wn, Sandy Clay < 30% Sand grove Stain/odog	
		Dry	0.0 108.3 67.4	No		27 28 29 30 31 32 33 34 35 36 37	4		SP SP	NO SE SAA NO SE	tain, Slight odor	

							_		Boring/Well #	0.1.2.2.0	
	4		7						Project:	BH-34 OH Randel #3	5
		7	Adv	<i>anci</i>	ng Op	oporti	IN	ity 🛛	Project #	017818016	
					-	-			Date	12115/18	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					37	II					
					38 39						
	David	36.4	NO		40	-		SP	Dense, White	Jorey, Sand, Some	
	Dry	3 ^{0.7}	xΨ V		42 _	-		Л	Silc < 15% NO Star	larcy, Sand, Some	
					44 -						
	D~/	19.7	Ne		46 47 48	-		58	Dense, Whit/ Silt <5% No Si	'grey, Sand trace tain/odor	
					49 50	-					
	Dry	950.2	No		51 52 53	-		SP	some clay	h brown, Sand <15% ain, Slight Odor	
					54 _ 55 _ 56						
	Dry	ì 118	No		57 _	BH- 34 55-60		SP		Mitclary Sand :5% n, Strong odar	
					59						<u> </u>

									Boring/Well #	P.1. 211	
				,	•				Project:	BH ~ 34 OH Randel #5	
		7	Adva	ancin	ig Opp	ortun	lity	/	Project #	017818016	
	14						-		Date	12/15/18	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
					60						
	Dry	 0 47	NO		61 62 63	-		SP	5AA no	Stain, Strong Odor 	-
				~~~	64 65 66 67	· · · · · · · ·		SP	SAL NOS	tain, Strong Odor	
	Dry	987	NO		68 69 70 71	-					-0
	DKY	<del>88</del> 8	No		72 73 74	- 		SC		n brown, <del>san</del> and 715% Clay Strong odor	
	DAy	943	NO	×	75 _ 76 _ 77 _ 78 _			SC	Very dense, 713 ⁹⁰ fines ,	. clayey Whit grey Sand no Stain, Strong oder	-
	<i></i> ,	2 * *			79 _ 80 _ 81 _ 82 _	-		SP	Block White inclusions, G Clay layers & TD 76'	Sand With Pyrite Hay Black reduced SI" thick	

Casing Typ Sche Screen Typ	0 Silica e: dule 40	PVC	Detector:	Slot:	PID		一、「大学学校のないない	BORIN Boring/Wel Date: Logged By: Drilling Me Seal: Diameter: Diameter:	BH - 3 5 12/15/14 Eric Carroll	e Drado 81301	del #5 8016 ne
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #		Sample Run	Recovery		Lithology/Re		Well Completion
	MOÏSE	31.]	NO		0   1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _				1006e, Dark reddis. Silby Sand M 	· ·	NO Well installed
	Moise	8.9	NP		8 9 10 11 12 13 14 15	2		SM	SAA no Stai	n lodo r	

									Boring/Well #	BH -35	
	17		Adv	<i>ianc</i> i	ina Ni	oporti	in	itv	Project:	OH Randel #5	
	Th		# 664 B	STIVI				- <b>y</b>	Project # Date	017818016	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		blogy/Remarks	Well Completion
					15						
	MOi3t-	6.7	Ne		16 17 18 19	2		5C	lt reddish br < 309e Sand	own, Gandy Cluy no Stain/odor	+ + + + + + + + +
	moist	۵،0	NO		20 21 22 23	-		SC	lt brown, den < 30% cla	nse Clayer Sand Y no Stain/ador	
	moist	0,0	Ne		24 25 26 27 28	3.		50	SAA		
	Moïst	41.8	NP		29 30 31 32 33	4		SC	SAA No Stain	- n/odor -	
					34 _ 35 _ 36 _ 37	-					-

									Boring/Well #	Dec 2D	
	15							4	Project:	BH - 313 OH Randel #5	
		-	Aa	<i>lanci</i>	ng Up	oportu	IN	ity	Project #	017818016	
	-								Date	12/15	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #		Sample Run	Recovery	Soil/Rock Type	Litho	Well Completion	
					37	Ψ	_				
	Dry	21.4	NO		38 39 40	+ - 4 -		SP		lgrey, Sand Some . cinlodor	+ + + -
	DRY	36.0			41	-	-	5P	SAA No sta	in/odo-	
			No	0/546	43 _ 44 _ 45 _ 46						-
	Dry	73.1	No	45'-50'01546	47 _ 48 _ 49 _			SP	SAA NO SE	ain/odor	- - - -
	DſY	70.3	No		50 51 52 53	-		58	544 no 5	tain/odor -	* - - - -
				55-60e/700	54 55 56 57			SP	SAA NOSTA	in lodor	
	Dry	<b> 6,  </b>	NO	55-6	58 59	-			TD=	60'	-

Gravel Pack: 10-20 Casing Type: Screen Type: Schedu	ule 40	PVC	Detector:	Slot:	PID			BORIN Boring/Wel Date: Logged By: Drilling Me Seal: Diameter:	<u>BH-36</u> <u>12/16/18</u> Eric Carroll	rado 81301	adel #5 8016 ne Barrel Depth to Liquid: MA Depth to Water:
	Moisture Content	Vapor (ppm)	HC Staining?	Sample #		Sample Run	Recovery	Soil/Rock Type	Lithology/Ren		Well Completion
	0.55	0, <del>7</del>	NO		0 1 2 3 4 5 6 7 8 9 10 11 12			SM	Dark, roddish brown, < 30% Sile It boo roddish brow < 30% Silt NO Stain,	N, Silby Sand	NO Well installed
r	<i>η</i> οίςε	Ö.7	No		12 13 14 15	2		SM	SAA ng Stain	10dgr -	

Ľ	Í.	2	Adv	anci	ing Op	oportu	IN	ity	Boring/Well # Project: Project # Date	BH-36 OH Randel #5 017818016 121161 14	
Penetration Resistance Moisture	Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
			•		15					-	
ma)	5+ (	0.6	No		16 17	2		\$CL	firm, Yellow Zzoto Sand,	Brown, Sandy Clay No Spain/odor	- - -
					18 19	-					
					20 21 22	-		CL	GAA NASI	tain/odor	-
mc;	5F (	0.5	NO		23 24 25						•: •: •:
	SL (	0.0	Ne		26 27 28	-	×	e CL	SAA no s	tain lador	
4					29 30						
		2.0	NP		31 32 33	-		SP	Danse, reddish Some Silt a No Stain		-
Ury		0.0	10	_ ~ ~ ~	34 35						
			4		36 37	-			21		-

										1	
			>						Boring/Well #	RH-36	
	1-1		Ad	anai	ing O	nnorti		ita	Project:	OH Randel #5	
		-	AU	/anci	ng Op	oporti		цy	Project #	017818016	
									Date	12/16/16	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					37	11					
	Dry	25,5	No		38 39	+		SP	Dense, White Silt <10%	No Stainlodor	-
	Dry	24.2	Ne		40 41 42 43	-		SP	SAA NO St	ain/odor	- - - -
	Dry	23.8	Ne		44 _ 45 _ 46 _ 47 _ 48 _	- - - - -		5M	Dense, (eddis 5: It 2 30%	h brown, sand some no stain?odar	• • • • • •
	Dry	58.0	NO	BH-36 50-55'	49			50- 5M	Dense reddis Gilb Berry K 1 White clay K No Scain/	in brown sand, some 5% interbedded 1" thick Odar	
	DRy	47.2	No	BH-36 55-60'	545556575859			SP- SM	SAA, NO 9 TD= GU	stain/Odor	





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

July 07, 2016

Ashley Ager XTO Energy 382 County Road 3100 Aztec, NM 87410 TEL: (505) 787-0519 FAX (505) 333-3280

RE: OH Randel #5

OrderNo.: 1607132

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 3 sample(s) on 7/6/2016 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 qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 7/7/2016

CLIENT: XTO Energy			Cli	ent Samp	le ID: HA	A 5 @ 16'	
<b>Project:</b> OH Randel #5			C	Collection	Date: 7/5	5/2016 11:55:00 AM	
Lab ID: 1607132-001	Matrix:	SOIL		Received	<b>Date:</b> 7/6	5/2016 7:35:00 AM	
Analyses	Result	PQL (	Qual I	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS	5				Analyst	t: TOM
Diesel Range Organics (DRO)	150	10		mg/Kg	1	7/6/2016 10:55:46 AM	26242
Surr: DNOP	90.4	70-130		%Rec	1	7/6/2016 10:55:46 AM	26242
EPA METHOD 8015D: GASOLINE RA	NGE					Analyst	t: NSB
Gasoline Range Organics (GRO)	310	21		mg/Kg	5	7/6/2016 11:30:14 AM	26229
Surr: BFB	354	80-120	S	%Rec	5	7/6/2016 11:30:14 AM	26229
EPA METHOD 8021B: VOLATILES						Analyst	t: NSB
Benzene	0.21	0.10		mg/Kg	5	7/6/2016 11:30:14 AM	26229
Toluene	3.5	0.21		mg/Kg	5	7/6/2016 11:30:14 AM	26229
Ethylbenzene	1.3	0.21		mg/Kg	5	7/6/2016 11:30:14 AM	26229
Xylenes, Total	15	0.42		mg/Kg	5	7/6/2016 11:30:14 AM	26229
Surr: 4-Bromofluorobenzene	120	80-120	S	%Rec	5	7/6/2016 11:30:14 AM	26229

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В
	D	Sample Diluted Due to Matrix	Е
	Н	Holding times for preparation or analysis exceeded	J
	ND	Not Detected at the Reporting Limit	Р
	R	RPD outside accepted recovery limits	RL
	S	% Recovery outside of range due to dilution or matrix	W

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Analyte detected below quantitation limits Page 1 of 6
- Sample pH Not In Range
- Reporting Detection Limit
- Sample container temperature is out of limit as specified

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 7/7/2016

CLIENT: XTO Energy			C	lient Sampl	e ID: HA	A 5 @ 21.5'	
<b>Project:</b> OH Randel #5				Collection 1	Date: 7/5	5/2016 1:00:00 PM	
Lab ID: 1607132-002	Matrix: S	SOIL		Received 1	Date: 7/6	5/2016 7:35:00 AM	
Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS					Analyst	: ТОМ
Diesel Range Organics (DRO)	66	10		mg/Kg	1	7/6/2016 11:17:24 AM	26242
Surr: DNOP	91.7	70-130		%Rec	1	7/6/2016 11:17:24 AM	26242
EPA METHOD 8015D: GASOLINE RAI	NGE					Analyst	: NSB
Gasoline Range Organics (GRO)	260	20		mg/Kg	5	7/6/2016 11:53:42 AM	26229
Surr: BFB	299	80-120	S	%Rec	5	7/6/2016 11:53:42 AM	26229
EPA METHOD 8021B: VOLATILES						Analyst	: NSB
Benzene	ND	0.10		mg/Kg	5	7/6/2016 11:53:42 AM	26229
Toluene	2.4	0.20		mg/Kg	5	7/6/2016 11:53:42 AM	26229
Ethylbenzene	1.0	0.20		mg/Kg	5	7/6/2016 11:53:42 AM	26229
Xylenes, Total	12	0.41		mg/Kg	5	7/6/2016 11:53:42 AM	26229
Surr: 4-Bromofluorobenzene	114	80-120		%Rec	5	7/6/2016 11:53:42 AM	26229

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
	Н	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	R	RPD outside accepted recovery limits
	S	% Recovery outside of range due to dilution or matrix

____

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits Page 2 of 6 J
- Р Sample pH Not In Range
- Reporting Detection Limit RL
- W Sample container temperature is out of limit as specified

### Hall Environmental Analysis Laboratory, Inc.

Lab Order 160/132 Date Reported: 7/7/2016

CLIENT: XTO Energy			Clie	ent Samp	le ID: HA	A 1 @ 20'	
<b>Project:</b> OH Randel #5			C	ollection	Date: 7/5	5/2016 4:00:00 PM	
Lab ID: 1607132-003	Matrix:	SOIL	ŀ	Received	<b>Date:</b> 7/6	5/2016 7:35:00 AM	
Analyses	Result	PQL (	Qual U	Inits	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS	5				Analyst	TOM
Diesel Range Organics (DRO)	17	9.9	r	ng/Kg	1	7/6/2016 11:39:25 AM	26242
Surr: DNOP	90.7	70-130	ç	%Rec	1	7/6/2016 11:39:25 AM	26242
EPA METHOD 8015D: GASOLINE RAI	NGE					Analyst	: NSB
Gasoline Range Organics (GRO)	810	65	r	ng/Kg	20	7/6/2016 12:17:10 PM	26229
Surr: BFB	166	80-120	S S	%Rec	20	7/6/2016 12:17:10 PM	26229
EPA METHOD 8021B: VOLATILES						Analyst	: NSB
Benzene	5.1	0.32	r	ng/Kg	20	7/6/2016 12:17:10 PM	26229
Toluene	56	0.65	r	ng/Kg	20	7/6/2016 12:17:10 PM	26229
Ethylbenzene	7.3	0.65	r	ng/Kg	20	7/6/2016 12:17:10 PM	26229
Xylenes, Total	74	1.3	r	ng/Kg	20	7/6/2016 12:17:10 PM	26229
Surr: 4-Bromofluorobenzene	113	80-120	c	%Rec	20	7/6/2016 12:17:10 PM	26229

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

Qualifiers: * Value exceeds Maximum Contaminant Level. B Analyte detected in the ass

- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits Page 3 of 6
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

# **QC SUMMARY REPORT** Hall Environmental Analysis Laboratory, Inc.

Client: Project:	XTO Eı OH Rar										
Sample ID	LCS-26242	SampT	ype: LC	S	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID:	LCSS	Batch	ID: 26	242	R	unNo: 3	5436				
Prep Date:	7/6/2016	Analysis D	ate: 7/	6/2016	S	eqNo: 1	096556	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range O	rganics (DRO)	42	10	50.00	0	84.1	62.6	124			
Surr: DNOP		4.4		5.000		87.7	70	130			
Sample ID	MB-26242	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID:	PBS	Batch	ID: 26	242	R	unNo: 3	5436				
Prep Date:	7/6/2016	Analysis D	ate: 7/	6/2016	S	eqNo: 1	096557	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range O	rganics (DRO)	ND	10								
Surr: DNOP		9.5		10.00		95.4	70	130			
Sample ID	MB-26224	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID:	PBS	Batch	ID: 26	224	R	unNo: 3	5437				
Prep Date:	7/5/2016	Analysis D	ate: 7/	6/2016	S	eqNo: 1	096560	Units: %Rec	;		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		9.5		10.00		94.6	70	130			
Sample ID	LCS-26224	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID:	LCSS	Batch	D: 26	224	R	unNo: 3	5437				
Prep Date:	7/5/2016	Analysis D	ate: 7/	6/2016	S	eqNo: 1	096561	Units: %Red	;		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		4.1		5.000		82.6	70	130			

#### **Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix D
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- 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 4 of 6

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

XTO Energy

Page 5 of 6

<b>Project:</b> OH Rar	ndel #5								
Sample ID MB-26229	SampType:	MBLK	Tes	tCode: EF	PA Method	8015D: Gasc	oline Rang	e	
Client ID: PBS	Batch ID:	26229	F	RunNo: 3	5443				
Prep Date: 7/5/2016	Analysis Date:	7/6/2016	S	SeqNo: 10	097615	Units: <b>mg/H</b>	٢g		
Analyte	Result PQ	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO) Surr: BFB	ND 5 960	.0 1000		95.5	80	120			
Sample ID LCS-26229	SampType:	LCS	Tes	tCode: EF	PA Method	8015D: Gasc	oline Rang	e	
Client ID: LCSS	Batch ID:	26229	F	RunNo: 3	5443				
Prep Date: 7/5/2016	Analysis Date:	7/6/2016	S	SeqNo: 10	097616	Units: mg/H	٢g		
Analyte	Result PQ	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26 5	.0 25.00	0	105	80	120			
Surr: BFB						120			

#### **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
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT	
Hall Environmental Analysis Laboratory, Inc.	

**XTO Energy** 

WO#: 1607132 07-Jul-16

Project: OH Ran	idel #5								
Sample ID MB-26229	SampType: I	MBLK	Tes	tCode: El	PA Method	8021B: Volat	iles		
Client ID: PBS	Batch ID: 2	26229	F	RunNo: 3	5443				
Prep Date: 7/5/2016	Analysis Date:	7/6/2016	S	SeqNo: 1	097633	Units: <b>mg/K</b>	g		
Analyte	Result PQI	_ SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND 0.02	5							
Toluene	ND 0.05	0							
Ethylbenzene	ND 0.05	0							
Xylenes, Total	ND 0.1	0							
Surr: 4-Bromofluorobenzene	0.93	1.000		92.8	80	120			
			_						
Sample ID LCS-26229	SampType: I	LCS	Tes	tCode: El	PA Method	8021B: Volat	iles		
Client ID: LCS-26229	SampType: I Batch ID: 2			tCode: El RunNo: 3		8021B: Volat	iles		
	1 21	26229	F		5443	8021B: Volat			
Client ID: LCSS	Batch ID:	26229 7/6/2016	F	RunNo: 3	5443			RPDLimit	Qual
Client ID: LCSS Prep Date: 7/5/2016	Batch ID: 2	26229 7/6/2016 _ SPK value	F	RunNo: <b>3</b> SeqNo: <b>1</b>	5443 097635	Units: mg/K	g	RPDLimit	Qual
Client ID: LCSS Prep Date: 7/5/2016 Analyte	Batch ID: 2 Analysis Date: Result PQI	26229 7/6/2016 _ SPK value 5 1.000	F S SPK Ref Val	RunNo: 3 SeqNo: 10 %REC	5443 097635 LowLimit	Units: <b>mg/K</b> HighLimit	g	RPDLimit	Qual
Client ID: LCSS Prep Date: 7/5/2016 Analyte Benzene	Batch ID: 2 Analysis Date: Result PQI 0.98 0.02	<b>7/6/2016</b> SPK value 5 1.000 0 1.000	F S SPK Ref Val 0	RunNo: 3 SeqNo: 10 <u>%REC</u> 97.8	5443 097635 LowLimit 75.3	Units: <b>mg/K</b> HighLimit 123	g	RPDLimit	Qual
Client ID: LCSS Prep Date: 7/5/2016 Analyte Benzene Toluene	Batch ID: 2 Analysis Date: Result PQI 0.98 0.02 0.97 0.05	<b>7/6/2016</b> <b>SPK value</b> <b>5</b> 1.000 0 1.000 0 1.000	F SPK Ref Val 0 0	RunNo: <b>3</b> SeqNo: <b>1</b> <u>%REC</u> 97.8 96.9	5443 097635 LowLimit 75.3 80	Units: <b>mg/K</b> HighLimit 123 124	g	RPDLimit	Qual

#### **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
- R RPD outside accepted recovery limits
- 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 6 of 6

#### HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

# Sample Log-In Check List

Client Name: XTO Energy	Work Order Numbe	r: 1607132	·	RcptNo:	1
Received by/date: AT 071	della			,	
Logged By: Anne Thorne	7/6/2016 7:35:00 AM		arne Arm		
Completed By: Anne Thorne	7/6/2016		Anne Arm Anne Arm		
Reviewed By:	07/06/16		and from		
Chain of Custody					
1. Custody seals intact on sample bottles?		Yes	No 🗌	Not Present 🔽	
2. Is Chain of Custody complete?		Yes 🗹	No 🗌	Not Present	
3. How was the sample delivered?		<u>Courier</u>			
Log In					
4. Was an attempt made to cool the sample	os?	Yes 🗹	No 🗌	NA 🗌	
5. Were all samples received at a temperatu	ire of >0° C to 6.0°C	Yes 🗹	No 🗌	NA 🗌	
6. Sample(s) in proper container(s)?		Yes 🔽	No 🗌		
7. Sufficient sample volume for indicated tes	t(s)?	Yes 🗹	No 🗌		
8. Are samples (except VOA and ONG) prop	erly preserved?	Yes 🗹	No 🗌		
9. Was preservative added to bottles?		Yes 🗌	No 🗹	NA 🗌	
10. VOA vials have zero headspace?		Yes	No 🗌	No VOA Vials 🗹	
11. Were any sample containers received bro	oken?	Yes 🗀	No 🗹	# of preserved	
12. Does paperwork match bottle labels?		Yes 🗹	No 🗆	bottles checked for pH:	
(Note discrepancies on chain of custody) 13. Are matrices correctly identified on Chain	of Custody?	Yes 🖌	No 🗆	< 2 o Adjusted?	r >12 unless noted)
14. Is it clear what analyses were requested?	of Custody?	Yes 🗹		• _	
15. Were all holding times able to be met? (If no, notify customer for authorization.)		Yes 🗹		Checked by:	
Special Handling (if applicable)					
16. Was client notified of all discrepancies with	h this order?	Yes	No 🗌	NA 🗹	
Person Notified: By Whom: Regarding:	Date Via:	🗌 eMail 🔲 P	hone 🗌 Fax	In Person	

17. Additional remarks:

Client Instructions:

#### 18. Cooler Information

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

I	۲ ۲							(N	or	<u>(</u> )	Air Bubbles					 					- 1155	1600	7
HALL ENVIDONMENTAL	LABORATORY		60								<u></u>					 	 				-7516-	- 418-1-15/10 -	alytical report.
2	Ö	Ę	Albuquerque, NM 87109	4107					(AC	ο <b>Λ</b> -	imə2) 0728			·							· · ·	55	the an
Q	Ž	www.hallenvironmental.com	e, B	505-345-4107	Request					(∀	OV) 80928										TH DAC	FARAC	ated on
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Ź	ΪS	viron	nbnq	Fax	Analysis	( [*] O	S' [†] Od	^{'²} ON			D,7) snoinA					 					· · ·		be clea
<u>ц</u>	3	allen	- A		Anal		(014)	0.0.1													11	22	ta will
Z	ANALYSIS	w.h	NE NE	3975			(SMI				EDB (Metho 158) a'HA9					 						50	racted data will I
	2	Š	vkins	-345-							TPH (Method					 						HASA	contrac
			4901 Hawkins NE	Tel. 505-345-3975		<del>(0</del> 2	HAL-/ O'				89108 H9J	X	Y	X			 	-				I I I	Any sub-co
			490'	Tel.							TEX + MT	ř			`	 					Remarks:		lity. Ar
						()	.Z08) s			38	BTEX +-₩Ŧ	×	Ń	X							Rem		idissoq
Same Day	sh 24 havy		₹ A				der s	Adams & AlexCoort			ve HEAL No.	201	202	202					×		1 TISH Time	Unice Time	atories. This serves as notice of this
Time:		~ ~ ~	Kandel			ager:	lay Az	BSh Ada	Å Yes	perature:	Preservative Type	lag -	1000	[C 020]							Whall	n l	accredited labora
Turn-Around Time:	□ Standard	5	0++ V	Project #:		Project Manage	AShla	$  \rangle$	On Ice: 🤇	Sample Temperature:	Container Type and #	1402 m	1/ yozlar	V/UB IDNY	$\mathcal{O}$ . )						Preved by:	Received by:	contracted to other
Chain-of-Custody Record	126	Janie	2 Ld 3/00	01h25	-0715		I.evel 4 (Full Validation)				Sample Request ID	HAS 16'	HASA ZIS'	HA \$ 9 20 '	-						ed by	NIL DULE	samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.
-of-Cu	nerger		5 2 C 2 2	ATTAC INN 874	5-419				Other		Matrix	Son -	1105	105							Relinguished	Relinquish	v, samples sub
Chain	140	SIM 6	ailing Address:	HPC 1	#: S0	or Fax#:	√QC Package: . Standard	screditation	NELAP	EDD (Type)	Time	21 21	3 1200	1) (000						. 	Le Time:		If necessary
J	ient:		ailinç	4	Jone	nail	Y OC		۳ ۲		Date	2	El la								iii S		ļ



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

August 09, 2016

James McDaniel XTO Energy 382 County Road 3100 Aztec, NM 87410 TEL: (505) 787-0519 FAX (505) 333-3280

RE: OH Randel #5

OrderNo.: 1608126

Dear James McDaniel:

Hall Environmental Analysis Laboratory received 6 sample(s) on 8/3/2016 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 qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/9/2016

CLIENT: XTO Energy	Client Sample ID: BH-6@9' Collection Date: 8/2/2016 1:00:00 PM										
<b>Project:</b> OH Randel #5											
Lab ID: 1608126-001	Matrix:	Rec	eived Date: 8	8/3/	/2016 7:20:00 AM						
Analyses	Result	PQL (	Qual Unit	s D	F	Date Analyzed	Batch				
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANIC	S				Analys	t: <b>KJH</b>				
Diesel Range Organics (DRO)	140	9.7	mg/	۰ ۲g	1	8/3/2016 1:23:47 PM	26760				
Surr: DNOP	105	70-130	%Re	ec .	1	8/3/2016 1:23:47 PM	26760				
EPA METHOD 8015D: GASOLINE RAI	NGE					Analys	t: NSB				
Gasoline Range Organics (GRO)	840	99	mg/	۲g ۲	20	8/5/2016 2:53:37 PM	26763				
Surr: BFB	302	49.4-163	S %Re	ec 2	20	8/5/2016 2:53:37 PM	26763				
EPA METHOD 8021B: VOLATILES						Analys	t: NSB				
Benzene	ND	0.49	mg/	۲g ۲	20	8/5/2016 2:53:37 PM	26763				
Toluene	1.8	0.99	mg/	Kg 2	20	8/5/2016 2:53:37 PM	26763				
Ethylbenzene	1.7	0.99	mg/	Kg 2	20	8/5/2016 2:53:37 PM	26763				
Xylenes, Total	20	2.0	mg/	Kg 2	20	8/5/2016 2:53:37 PM	26763				
Surr: 4-Bromofluorobenzene	108	80-120	%Re	ec 2	20	8/5/2016 2:53:37 PM	26763				

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	I
	D	Sample Diluted Due to Matrix	I
	Н	Holding times for preparation or analysis exceeded	J
	ND	Not Detected at the Reporting Limit	I
	R	RPD outside accepted recovery limits	R
	S	% Recovery outside of range due to dilution or matrix	v

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits Page 1 of 9 J
- Р Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified W

### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 8/9/2016

CLIENT: XTO Energy			Client Sar	nple ID: BH	I-6@18'						
<b>Project:</b> OH Randel #5	Collection Date: 8/2/2016 1:05:00 PM										
Lab ID: 1608126-002	Matrix:	SOIL	Receive	ed Date: 8/3	8/2016 7:20:00 AM						
Analyses	Result	PQL (	Qual Units	DF	Date Analyzed	Batch					
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANIC	S			Analys	st: <b>KJH</b>					
Diesel Range Organics (DRO)	120	9.5	mg/Kg	1	8/3/2016 2:29:08 PM	26760					
Surr: DNOP	107	70-130	%Rec	1	8/3/2016 2:29:08 PM	26760					
EPA METHOD 8015D: GASOLINE RAI	NGE				Analys	st: NSB					
Gasoline Range Organics (GRO)	1000	98	mg/Kg	20	8/5/2016 3:17:13 PM	26763					
Surr: BFB	226	49.4-163	S %Rec	20	8/5/2016 3:17:13 PM	26763					
EPA METHOD 8021B: VOLATILES					Analys	st: NSB					
Benzene	ND	0.49	mg/Kg	20	8/5/2016 3:17:13 PM	26763					
Toluene	7.3	0.98	mg/Kg	20	8/5/2016 3:17:13 PM	26763					
Ethylbenzene	2.4	0.98	mg/Kg	20	8/5/2016 3:17:13 PM	26763					
Xylenes, Total	27	2.0	mg/Kg	20	8/5/2016 3:17:13 PM	26763					
Surr: 4-Bromofluorobenzene	105	80-120	%Rec	20	8/5/2016 3:17:13 PM	26763					

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	1
	D	Sample Diluted Due to Matrix	]
	Н	Holding times for preparation or analysis exceeded	
	ND	Not Detected at the Reporting Limit	
	R	RPD outside accepted recovery limits	F
	S	% Recovery outside of range due to dilution or matrix	V

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits Page 2 of 9 J
- Р Sample pH Not In Range
- Reporting Detection Limit RL
- W Sample container temperature is out of limit as specified

**Analytical Report** Lab Order 1608126 Date Reported: 8/9/2016

### Hall Environmental Analysis Laboratory, Inc.

CLIENT: XTO Energy Client Sample ID: BH-7@11' **Project:** OH Randel #5 Collection Date: 8/2/2016 12:50:00 PM 1608126-003 Matrix: MEOH (SOIL) Received Date: 8/3/2016 7:20:00 AM Lab ID:

Analyses	Result	PQL (	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RA		s				Analyst	KJH
Diesel Range Organics (DRO)	400	10		mg/Kg	1	8/3/2016 10:03:18 AM	26760
Surr: DNOP	103	70-130		%Rec	1	8/3/2016 10:03:18 AM	26760
EPA METHOD 8015D: GASOLINE RA	ANGE					Analyst	: NSB
Gasoline Range Organics (GRO)	1700	84		mg/Kg	20	8/3/2016 9:32:24 AM	26741
Surr: BFB	617	49.4-163	S	%Rec	20	8/3/2016 9:32:24 AM	26741
EPA METHOD 8021B: VOLATILES						Analyst	: NSB
Benzene	ND	0.42		mg/Kg	20	8/3/2016 9:32:24 AM	26741
Toluene	2.6	0.84		mg/Kg	20	8/3/2016 9:32:24 AM	26741
Ethylbenzene	3.6	0.84		mg/Kg	20	8/3/2016 9:32:24 AM	26741
Xylenes, Total	39	1.7		mg/Kg	20	8/3/2016 9:32:24 AM	26741
Surr: 4-Bromofluorobenzene	127	80-120	S	%Rec	20	8/3/2016 9:32:24 AM	26741

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	А
	D	Sample Diluted Due to Matrix	Е	V
	Н	Holding times for preparation or analysis exceeded	J	А
	ND	Not Detected at the Reporting Limit	Р	S
	R	RPD outside accepted recovery limits	RL	R
	S	% Recovery outside of range due to dilution or matrix	W	S

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Analyte detected below quantitation limits Page 3 of 9
- Sample pH Not In Range
- Reporting Detection Limit
- Sample container temperature is out of limit as specified

**Analytical Report** Lab Order 1608126 Date Reported: 8/9/2016

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** XTO Energy

OH Randel #5

1608126-004

**Project:** 

Lab ID:

Client Sample ID: BH-7@12' Collection Date: 8/2/2016 12:55:00 PM Matrix: MEOH (SOIL) Received Date: 8/3/2016 7:20:00 AM

Analyses	Result	PQL (	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANIC	s				Analyst	: KJH
Diesel Range Organics (DRO)	350	10		mg/Kg	1	8/3/2016 10:25:02 AM	26760
Surr: DNOP	102	70-130		%Rec	1	8/3/2016 10:25:02 AM	26760
EPA METHOD 8015D: GASOLINE RA	NGE					Analyst	: NSB
Gasoline Range Organics (GRO)	2600	84		mg/Kg	20	8/3/2016 9:55:52 AM	26741
Surr: BFB	691	49.4-163	S	%Rec	20	8/3/2016 9:55:52 AM	26741
EPA METHOD 8021B: VOLATILES						Analyst	: NSB
Benzene	ND	0.42		mg/Kg	20	8/3/2016 9:55:52 AM	26741
Toluene	9.4	0.84		mg/Kg	20	8/3/2016 9:55:52 AM	26741
Ethylbenzene	8.3	0.84		mg/Kg	20	8/3/2016 9:55:52 AM	26741
Xylenes, Total	94	1.7		mg/Kg	20	8/3/2016 9:55:52 AM	26741
Surr: 4-Bromofluorobenzene	137	80-120	S	%Rec	20	8/3/2016 9:55:52 AM	26741

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	
	R	RPD outside accepted recovery limits	I
	S	% Recovery outside of range due to dilution or matrix	,

- В Analyte detected in the associated Method Blank
- Value above quantitation range Е
- Analyte detected below quantitation limits Page 4 of 9 J
- Р Sample pH Not In Range
- RL Reporting Detection Limit
- Sample container temperature is out of limit as specified W

Date Reported: 8/9/2016

### Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** XTO Energy

**Project:** OH Randel #5

Client Sample ID: BH-8@16' Collection Date: 8/2/2016 12:45:00 PM

Lab ID: 1608126-005	Matrix:	SOIL	Received 1	Date: 8/3	/2016 7:20:00 AM	
Analyses	Result	PQL (	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANIC	S			Analys	t: <b>KJH</b>
Diesel Range Organics (DRO)	340	9.5	mg/Kg	1	8/3/2016 2:50:55 PM	26760
Surr: DNOP	107	70-130	%Rec	1	8/3/2016 2:50:55 PM	26760
EPA METHOD 8015D: GASOLINE RAI	NGE				Analys	t: NSB
Gasoline Range Organics (GRO)	560	94	mg/Kg	20	8/4/2016 6:27:38 PM	26763
Surr: BFB	296	49.4-163	S %Rec	20	8/4/2016 6:27:38 PM	26763
EPA METHOD 8021B: VOLATILES					Analys	t: NSB
Benzene	ND	0.47	mg/Kg	20	8/4/2016 6:27:38 PM	26763
Toluene	ND	0.94	mg/Kg	20	8/4/2016 6:27:38 PM	26763
Ethylbenzene	1.3	0.94	mg/Kg	20	8/4/2016 6:27:38 PM	26763
Xylenes, Total	12	1.9	mg/Kg	20	8/4/2016 6:27:38 PM	26763
Surr: 4-Bromofluorobenzene	109	80-120	%Rec	20	8/4/2016 6:27:38 PM	26763

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

Keler to the QE Summary report and sample login enceknist for mageed QE data and preservation mion

- * Value exceeds Maximum Contaminant Level.
  - D Sample Diluted Due to Matrix

**Oualifiers:** 

- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- 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 Page 5 of 9
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

**Analytical Report** Lab Order 1608126 Date Reported: 8/9/2016

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** XTO Energy Client Sample ID: BH-9@16' **Project:** OH Randel #5 Collection Date: 8/2/2016 12:40:00 PM 1608126-006 Matrix: MEOH (SOIL) Received Date: 8/3/2016 7:20:00 AM Lab ID:

Analyses	Result	PQL (	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RAI	s				Analys	t: KJH	
Diesel Range Organics (DRO)	240	9.5		mg/Kg	1	8/3/2016 10:46:38 AM	26760
Surr: DNOP	94.4	70-130		%Rec	1	8/3/2016 10:46:38 AM	26760
EPA METHOD 8015D: GASOLINE RA	NGE					Analys	t: NSB
Gasoline Range Organics (GRO)	2200	210		mg/Kg	50	8/3/2016 10:19:20 AM	26741
Surr: BFB	237	49.4-163	S	%Rec	50	8/3/2016 10:19:20 AM	26741
EPA METHOD 8021B: VOLATILES						Analys	t: NSB
Benzene	ND	1.0		mg/Kg	50	8/3/2016 10:19:20 AM	26741
Toluene	23	2.1		mg/Kg	50	8/3/2016 10:19:20 AM	26741
Ethylbenzene	8.7	2.1		mg/Kg	50	8/3/2016 10:19:20 AM	26741
Xylenes, Total	100	4.1		mg/Kg	50	8/3/2016 10:19:20 AM	26741
Surr: 4-Bromofluorobenzene	108	80-120		%Rec	50	8/3/2016 10:19:20 AM	26741

*	Value exceeds Maximum Contaminant Level.	В
D	Sample Diluted Due to Matrix	Е
Н	Holding times for preparation or analysis exceeded	J
ND	Not Detected at the Reporting Limit	Р
R	RPD outside accepted recovery limits	RL
S	% Recovery outside of range due to dilution or matrix	W
	D H ND	<ul> <li>D Sample Diluted Due to Matrix</li> <li>H Holding times for preparation or analysis exceeded</li> <li>ND Not Detected at the Reporting Limit</li> <li>R RPD outside accepted recovery limits</li> </ul>

- Analyte detected in the associated Method Blank
- Value above quantitation range Е
- Analyte detected below quantitation limits Page 6 of 9
- D Sample pH Not In Range
- Reporting Detection Limit RL
- Sample container temperature is out of limit as specified N

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client:	XTO Ene	ergy									
Project:	OH Rand	lel #5									
Sample ID	LCS-26760	SampTy	/pe: <b>LC</b>	s	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	LCSS	Batch	ID: 26	760	F	RunNo: 3	6186				
Prep Date:	8/3/2016	Analysis Da	ate: <b>8</b> /	/3/2016	S	SeqNo: 1	120950	Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range	Organics (DRO)	40	10	50.00	0	79.1	62.6	124			
Surr: DNOP		4.5		5.000		90.1	70	130			
Sample ID	MB-26760	SampTy	/pe: <b>M</b>	BLK	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	PBS	Batch	ID: 26	760	F	RunNo: 3	6186				
Prep Date:	8/3/2016	Analysis Da	ate: <b>8</b> /	/3/2016	S	SeqNo: 1	120951	Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range	Organics (DRO)	ND	10								
Surr: DNOP		8.5		10.00		85.0	70	130			
Sample ID	1608126-001AMS	SampTy	/pe: <b>M</b> \$	S	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	BH-6@9'	Batch	ID: 26	760	F	RunNo: 3	6185				
Prep Date:	8/3/2016	Analysis Da	ate: <b>8</b> /	/3/2016	5	SeqNo: 1	121248	Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range	Organics (DRO)	170	9.8	49.12	138.0	60.9	33.9	141			
Surr: DNOP		5.3		4.912		107	70	130			
Sample ID	1608126-001AMS	D SampTy	/pe: <b>M</b> \$	SD	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	BH-6@9'	Batch	ID: 26	760	F	RunNo: 3	6185				
Prep Date:	8/3/2016	Analysis Da	ate: <b>8</b> /	/3/2016	S	SeqNo: 1	121249	Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
•	Organics (DRO)	150	9.2	46.21	138.0	33.3	33.9	141	9.01	20	S
Surr: DNOP		4.9		4.621		106	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
- R RPD outside accepted recovery limits
- 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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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: 1608126 09-Aug-16

Client: Project:	XTO Er OH Ran	01									
Sample ID	MB-26741	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	е	
Client ID:	PBS	Batch	ID: 26	741	R	aunNo: 3	6191				
Prep Date:	8/2/2016	Analysis D	ate: <b>8/</b>	3/2016	S	SeqNo: 1	121472	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	je Organics (GRO)	ND 960	5.0	1000		96.4	49.4	163			
Sample ID	LCS-26741	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	е	
Client ID:	LCSS	Batch	ID: 26	741	R	lunNo: 3	6191				
Prep Date:	8/2/2016	Analysis D	ate: 8/	3/2016	S	SeqNo: 1	121473	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
	je Organics (GRO)	26	5.0	25.00	0	102	80	120			
Surr: BFB		1100		1000		106	49.4	163			
Sample ID	MB-26763	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	е	
Client ID:	PBS	Batch	ID: 26	763	R	RunNo: 3	6215				
Prep Date:	8/3/2016	Analysis D	ate: 8/	4/2016	S	SeqNo: 1	122450	Units: <b>mg/</b>	٤g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	e Organics (GRO)	ND 970	5.0	1000		97.0	49.4	163			
Sample ID	LCS-26763	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	е	
Client ID:	LCSS	Batch	ID: 26	763	R	lunNo: 3	6215				
Prep Date:	8/3/2016	Analysis D	ate: <b>8/</b>	4/2016	S	SeqNo: 1	122452	Units: mg/k	ζg		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
	je Organics (GRO)	26	5.0	25.00	0	102	80	120			
Surr: BFB		1000		1000		105	49.4	163			

#### **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
- R RPD outside accepted recovery limits
- 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 8 of 9

Hall Er	nvironmen	tal Anal	ysis I	Laborat	ory, Inc.					W O#.	1008120 09-Aug-10
Client: Project:	XTO E OH Ra	Energy ndel #5									
Sample ID	MB-26741	SampT	ype: ME	BLK	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batch	n ID: 26	741	R	RunNo: 3	6191				
Prep Date:	8/2/2016	Analysis D	Date: <b>8/</b>	3/2016	S	SeqNo: 1	121479	Units: <b>mg/k</b>	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	0.91		1.000		91.5	80	120			
Sample ID	LCS-26741	SampT	ype: LC	S	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batch	n ID: 26	741	R	RunNo: 3	6191				
Prep Date:	8/2/2016	Analysis D	0ate: 8/	3/2016	S	SeqNo: 1	121480	Units: mg/h	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		1.0	0.025	1.000	0	101	75.3	123			
Toluene		0.98	0.050	1.000	0	97.6	80	124			
Ethylbenzene		1.0	0.050	1.000	0	101	82.8	121			
Xylenes, Total		3.0	0.10	3.000	0	100	83.9	122			
Surr: 4-Bron	nofluorobenzene	0.96		1.000		96.5	80	120			
Sample ID	MB-26763	SampT	ype: ME	BLK	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batch	n ID: 26	763	R	RunNo: 3	6215				
Prep Date:	8/3/2016	Analysis D	0ate: <b>8/</b>	4/2016	S	SeqNo: 1	122473	Units: <b>mg/k</b>	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	0.92		1.000		91.5	80	120			
Sample ID	LCS-26763	SampT	ype: LC	s	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batch ID: 26763 RunNo: 36215									
Prep Date:	8/3/2016	Analysis D	0ate: <b>8/</b>	4/2016	S	SeqNo: 1	122474	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.94	0.025	1.000	0	94.4	75.3	123			
Toluene		0.92	0.050	1.000	0	91.9	80	124			
Ethylbenzene		0.96	0.050	1.000	0	95.8	82.8	121			
Xylenes, Total		2.9	0.10	3.000	0	96.4	83.9	122			
Surr: 4-Bron	nofluorobenzene	0.95		1.000		95.0	80	120			

#### **Qualifiers:**

* Value exceeds Maximum Contaminant Level.

**QC SUMMARY REPORT** 

- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- 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 Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87105 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

## Sample Log-In Check List

Client Name: XTO Energy	Work Order 1	Number: 1608126		RcptNo:	1
Received by/date: Logged By: Lindsay M Completed By: Lindsay M	angin 8/3/2016 7:44:-		Juniby Hopgs Juniby Hopgs		
Reviewed By: TC	08/03/1	G			
Chain of Custody	ample helling?	Yes	No	Not Present 😹	
<ol> <li>Custody seals intact on si</li> <li>Is Chain of Custody comp</li> </ol>		Yes 🐼	No	Not Present	
<ol> <li>S. How was the sample deliv</li> </ol>		Courier			
Log In					
4. Was an attempt made to	cool the samples?	Yes 🕏	No	NA	
5. Were all samples receive	d at a temperature of >0° C to 6.0	°C Yes 🐱	No	NA	
6. Sample(s) in proper cont	ainer(s)?	Yes 🖌	No [.]		
7. Sufficient sample volume	for indicated test(s)?	Yes 🐼	No		
8. Are samples (except VOA	A and ONG) properly preserved?	Yes 🛃	No [.]]		
9. Was preservative added	to bottles?	Yes :	No 📝	NA [_]	
10.voA vials have zero head	dspace?	Yes	No	No VOA Vials 💉	
11. Were any sample contair	ners received broken?	Yes	No 🕷	# of preserved	
12.Does paperwork match b (Note discrepancies on cl		Yes 🕷	No .	bottles checked for pH:	or >12 unless noted)
13 Are matrices correctly ide		Yes 🕷	No	Adjusted?	
14. Is it clear what analyses v	were requested?	Yes 🖌	No		
15.Were all holding times ab (If no, notify customer for		Yes 🖈	No	Checked by:	
Special Handling (if ap	plicable)				
16.Was client notified of all o	discrepancies with this order?	Yes	No	NA 🗷	
Person Notified:	an angleich an leannan an ann an chanail lead an lean Anna Annaichte an an an aite an	Date:			
By Whom:		Via: [; eMail	[]] Phone [ Fax	In Person	
Regarding:					
Client Instructions:					
17. Additional remarks:					
18. <u>Cooler Information</u> Cooler No Temp °C 1 1.7	Condition Seal Intact Sea Good Yes	I No Seal Date	Signed By		

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	ANALYSIS LABORATORY	www.hallenvironmental.com	4901 Hawkins NE - Albuquerque, NM 87109	Tel. 505-345-3975 Fax 505-345-4107	Analysis Request	(*0	PO4,SMI	(1.8 200.5 200.5 200.5 2808.7	7) (NO (92 (92 (92 (92 (92 (92) (92) (92) (92)	offad (Metho EDB (Metho 2158) a'HA9 27,8) a'HA9 37,9) anoina 7,7) anoina 8260B (VOA 8250B (VOA								- day on BH-7 & BH-	Date Time Only Det CA16 CA20 This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.
			4901	Tel. 5				1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		BTEX + MTI 80158	X	$\times$	$\geq$	$\times$	×	X	_	narks: Some	by. Any :
										FTEX + MH		X	X	X	×	X		Remarks: 50 w	possibili
Turn-Around Time: See Remarks	XStandard & Rush Same Day	Project Name:		1 1	012916007	Project Manager:	Devin Hencmann	0/10	Temperature: / T		(1) 402. cool -001	-602	-003	-124	-905	v v -0000		athelalla	Received by: Date Time Date Time Ubcontracted to other accredited laboratories. This serves as notice of this
Chain-of-Custody Record	ient XTO Energy Inc	Demes Mc Daviel	alling Address: 382 County Road 3100	Arzec, NM STYLO	1000 #: 505-419-0315	nail or Fax#:	VQC Package: Standard   Level 4 (Full Validation)	1 Othe	(be)	Date Time Matrix Sample Request ID	2-16 1300 Soil BH-6 @91	1305 1 84-6@18		B55 BH-7.012'	-	>		Time: Relin	ite: Time: Religional by Received by: Received by: 08 Interested by: 08 Interested by: 08 Interested to other addread to other addreadones.



# ANALYTICAL REPORT

L905176



#### **XTO Energy - San Juan Division**

Sample Delivery Group:

Samples Received:

Project Number:

Description:

Report To:

Site:

04/26/2017 OH RANDEL #5 James McDaniel

382 County Road 3100

Aztec, NM 87410

Entire Report Reviewed By:

Dapline R Richards

Daphne Richards Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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BH-11 20-25' L905176-01 Solid			Collected by D. Burns	Collected date/time 04/19/17 12:15	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	.99	05/02/17 09:39	05/03/17 16:49	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 09:26	ACM
BH-12 0-10' L905176-02 Solid			Collected by D. Burns	Collected date/time 04/19/17 13:00	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation	Analysis	Analyst
	11/2074507	4	date/time	date/time	KDW
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975972	.97	05/02/17 09:39	05/03/17 17:11	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 10:07	ACM
BH-12 10-15' L905176-03 Solid			Collected by D. Burns	Collected date/time 04/19/17 13:15	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	200	05/02/17 09:39	05/03/17 13:29	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 10:20	ACM
BH-12 15-20' L905176-04 Solid			Collected by D. Burns	Collected date/time 04/19/17 13:25	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975972	.93	05/02/17 09:39	05/03/17 17:33	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 10:34	ACM
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	10	05/01/17 21:13	05/02/17 12:10	ACM
BH-12 20-25' L905176-05 Solid			Collected by D. Burns	Collected date/time 04/19/17 13:40	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	.98	05/02/17 09:39	05/03/17 17:55	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 10:47	ACM
3H-12 25-30' L905176-06 Solid			Collected by D. Burns	Collected date/time 04/19/17 14:00	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
				04/28/17 09:54	KDW
Fotal Solids by Method 2540 G-2011	WG974587	1	04/28/1/ 09:43	04/26/17 09.34	NDW
Total Solids by Method 2540 G-2011 Volatile Organic Compounds (GC) by Method 8015/8021	WG974587 WG975972	1 196	04/28/17 09:43 05/02/17 09:39	05/03/17 23:15	DWR

SDG: L905176

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BH-12 30-35' L905176-07 Solid			Collected by D. Burns	Collected date/time 04/19/17 14:35	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	2475	05/02/17 09:39	05/03/17 23:36	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 15:10	ACM
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	20	05/01/17 21:13	05/02/17 15:24	ACM
BH-13 0-10' L905176-08 Solid			Collected by D. Burns	Collected date/time 04/19/17 15:40	Received date/tim 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	.98	05/02/17 09:39	05/03/17 23:36	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 11:15	ACM
BH-13 10-15' L905176-09 Solid			Collected by D. Burns	Collected date/time 04/19/17 15:50	Received date/tim 04/26/17 12:15
Method	Batch	Dilution	Preparation	Analysis	Analyst
	Baten	Silution	date/time	date/time	, analyse
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG974387 WG975972	.98	04/28/17 09:43	05/03/17 19:23	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015/6021	WG975037	.98	05/01/17 21:13	05/02/17 11:28	ACM
BH-13 15-20' L905176-10 Solid			Collected by D. Burns	Collected date/time 04/19/17 16:00	Received date/tim 04/26/17 12:15
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	- )
Total Solids by Method 2540 G-2011	WG974587	1	04/28/17 09:43	04/28/17 09:54	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	1	05/02/17 09:39	05/03/17 19:45	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 11:42	ACM
BH-13 20-25' L905176-11 Solid			Collected by D. Burns	Collected date/time 04/19/17 16:10	Received date/tim 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	200	05/02/17 09:39	05/03/17 23:57	DWR
		1	05/01/17 21:13	05/02/17 11:57	ACM
	WG975037				
Semi-Volatile Organic Compounds (GC) by Method 8015 BH-13 25-30' L905176-12 Solid	WG975037		Collected by D. Burns	Collected date/time 04/19/17 16:20	Received date/tim 04/26/17 12:15
Semi-Volatile Organic Compounds (GC) by Method 8015 BH-13 25-30' L905176-12 Solid	WG975037 Batch	Dilution			
Semi-Volatile Organic Compounds (GC) by Method 8015		Dilution	D. Burns Preparation	04/19/17 16:20 Analysis	04/26/17 12:15
Semi-Volatile Organic Compounds (GC) by Method 8015 BH-13 25-30' L905176-12 Solid Method	Batch		D. Burns Preparation date/time	04/19/17 16:20 Analysis date/time	Analyst

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BH-13 30-35' L905176-13 Solid			Collected by D. Burns	Collected date/time 04/19/17 16:35	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	194	05/02/17 09:39	05/03/17 20:51	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 13:18	ACM
BH-14 15-20' L905176-14 Solid			Collected by D. Burns	Collected date/time 04/20/17 09:30	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
/olatile Organic Compounds (GC) by Method 8015	WG975972	.97	05/02/17 09:39	05/03/17 21:13	BMB
Volatile Organic Compounds (GC) by Method 8021	WG975972	.98	05/02/17 09:39	05/04/17 04:25	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 13:33	ACM
BH-14 20-25' L905176-15 Solid			Collected by D. Burns	Collected date/time 04/20/17 09:45	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975972	.94	05/02/17 09:39	05/03/17 23:58	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 13:46	ACM
BH-15 0-10' L905176-16 Solid			Collected by D. Burns	Collected date/time 04/20/17 11:30	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
otal Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975972	49.5	05/02/17 09:39	05/04/17 18:39	BMB
iemi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 14:00	ACM
BH-15 10-15' L905176-17 Solid			Collected by D. Burns	Collected date/time 04/20/17 11:40	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975972	98	05/02/17 09:39	05/04/17 19:01	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 14:14	ACM
3H-15 15-20' L905176-18 Solid			Collected by D. Burns	Collected date/time 04/20/17 11:45	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	196	05/02/17 09:39	05/04/17 01:05	ACG

SDG: L905176

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BH-15 20-25' L905176-19 Solid			Collected by D. Burns	Collected date/time 04/20/17 12:00	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	198	05/02/17 09:39	05/04/17 01:27	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 14:41	ACM
BH-15 30-32' L905176-20 Solid			Collected by D. Burns	Collected date/time 04/20/17 13:20	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974589	1	04/27/17 15:10	04/27/17 15:28	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975972	49	05/02/17 09:39	05/04/17 19:24	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975037	1	05/01/17 21:13	05/02/17 14:55	ACM
BH-16 0-10' L905176-21 Solid			Collected by D. Burns	Collected date/time 04/20/17 14:20	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975980	.98	05/02/17 09:39	05/03/17 03:38	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 13:39	KLM
BH-16 10-15' L905176-22 Solid			Collected by D. Burns	Collected date/time 04/20/17 14:30	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975980	.95	05/02/17 09:39	05/03/17 04:00	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 13:53	KLM
BH-16 15-20' L905176-23 Solid			Collected by D. Burns	Collected date/time 04/20/17 14:40	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975980	495	05/02/17 09:39	05/04/17 19:46	BMB
Volatile Organic Compounds (GC) by Method 8021	WG975980	24.75	05/02/17 09:39	05/04/17 02:33	GLN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 13:26	KLM
BH-16 23-25' L905176-24 Solid			Collected by D. Burns	Collected date/time 04/20/17 15:15	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
	WG975980	200	05/02/17 09:39	05/03/17 01:03	LRL
Volatile Organic Compounds (GC) by Method 8015/8021					

SDG: L905176

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BH-16 25-27' L905176-25 Solid			Collected by D. Burns	Collected date/time 04/20/17 15:30	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG975980	200	05/02/17 09:39	05/03/17 04:44	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 13:12	KLM
BH-16 27-29' L905176-26 Solid			Collected by D. Burns	Collected date/time 04/20/17 15:40	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Fotal Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
Volatile Organic Compounds (GC) by Method 8015	WG975980	500	05/02/17 09:39	05/04/17 20:08	BMB
Volatile Organic Compounds (GC) by Method 8021	WG975980	25	05/02/17 09:39	05/04/17 02:55	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 12:31	KLM
BH-16 33-35' L905176-27 Solid			Collected by D. Burns	Collected date/time 04/20/17 16:05	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975980	.97	05/02/17 09:39	05/03/17 05:28	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 11:50	KLM
BH-17 20-25' L905176-28 Solid			Collected by D. Burns	Collected date/time 04/21/17 10:30	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Fotal Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975980	1	05/02/17 09:39	05/03/17 05:50	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 12:45	KLM
BH-18 30-32' L905176-29 Solid			Collected by D. Burns	Collected date/time 04/24/17 09:00	Received date/time 04/26/17 12:15
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Fotal Solids by Method 2540 G-2011	WG974591	1	04/27/17 14:57	04/27/17 15:05	KDW
/olatile Organic Compounds (GC) by Method 8015/8021	WG975980	.98	05/02/17 09:39	05/04/17 03:17	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG975038	1	04/29/17 12:28	05/01/17 12:18	KLM
3H-19 30-35' L905176-30 Solid			Collected by D. Burns	Collected date/time 04/24/17 10:25	Received date/time 04/26/17 12:15
		Dilution	Preparation	Analysis	Analyst
Method	Batch	Dilution	date/time	date/time	
Method Total Solids by Method 2540 G-2011	Batch WG974591	1	date/time 04/27/17 14:57	date/time 04/27/17 15:05	KDW
					KDW ACG

SDG: L905176

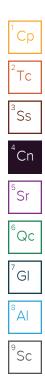
#### CASE NARRATIVE

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Japhne R Richards

Daphne Richards Technical Service Representative



### SAMPLE RESULTS - 01

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	80.9		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	ND		0.000612	.99	05/03/2017 16:49	WG975972	
Toluene	ND		0.00612	.99	05/03/2017 16:49	WG975972	
Ethylbenzene	ND		0.000612	.99	05/03/2017 16:49	WG975972	
Total Xylene	0.00220	B	0.00184	.99	05/03/2017 16:49	WG975972	
TPH (GC/FID) Low Fraction	ND		0.122	.99	05/03/2017 16:49	WG975972	
(S) a,a,a-Trifluorotoluene(FID)	99.4		77.0-120		05/03/2017 16:49	WG975972	
(S) a,a,a-Trifluorotoluene(PID)	91.9		75.0-128		05/03/2017 16:49	WG975972	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	ND		4.95	1	05/02/2017 09:26	<u>WG975037</u>	
C28-C40 Oil Range	ND		4.95	1	05/02/2017 09:26	<u>WG975037</u>	
(S) o-Terphenyl	70.0		18.0-148		05/02/2017 09:26	<u>WG975037</u>	

#### SAMPLE RESULTS - 02 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	90.1		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	ND		0.000538	.97	05/03/2017 17:11	WG975972	
Toluene	ND		0.00538	.97	05/03/2017 17:11	WG975972	
Ethylbenzene	ND		0.000538	.97	05/03/2017 17:11	WG975972	
Total Xylene	ND		0.00161	.97	05/03/2017 17:11	WG975972	
TPH (GC/FID) Low Fraction	ND		0.108	.97	05/03/2017 17:11	WG975972	
(S) a,a,a-Trifluorotoluene(FID)	101		77.0-120		05/03/2017 17:11	WG975972	
(S) a,a,a-Trifluorotoluene(PID)	92.2		75.0-128		05/03/2017 17:11	WG975972	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	5.66		4.44	1	05/02/2017 10:07	WG975037	
C28-C40 Oil Range	ND		4.44	1	05/02/2017 10:07	<u>WG975037</u>	
(S) o-Terphenyl	68.5		18.0-148		05/02/2017 10:07	WG975037	

#### SAMPLE RESULTS - 03 L905176

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	– Cp
Analyte	%			date / time		2
Total Solids	91.1		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Compounds (GC) by Method 8015/8021								
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch		
Analyte	mg/kg		mg/kg		date / time			⁴ Cn
Benzene	ND		0.110	200	05/03/2017 13:29	WG975972		CII
Toluene	ND		1.10	200	05/03/2017 13:29	WG975972		5
Ethylbenzene	0.403		0.110	200	05/03/2017 13:29	WG975972		Sr
Total Xylene	2.11	B	0.329	200	05/03/2017 13:29	WG975972		
TPH (GC/FID) Low Fraction	401		22.0	200	05/03/2017 13:29	WG975972		⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	103		77.0-120		05/03/2017 13:29	WG975972		QC
(S) a,a,a-Trifluorotoluene(PID)	93.3		75.0-128		05/03/2017 13:29	WG975972		7

#### Sample Narrative:

8015/8021 L905176-03 WG975972: Non-target compounds too high to run at a lower dilution.

							Co.
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Sc
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	39.7		4.39	1	05/02/2017 10:20	WG975037	
C28-C40 Oil Range	ND		4.39	1	05/02/2017 10:20	WG975037	
(S) o-Terphenyl	70.7		18.0-148		05/02/2017 10:20	WG975037	

#### SAMPLE RESULTS - 04 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	86.9		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Compounds (GC) by Method 8015/8021								
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch		
Analyte	mg/kg		mg/kg		date / time			4 Cr
Benzene	0.000728		0.000535	.93	05/03/2017 17:33	WG975972		
Toluene	0.00750		0.00535	.93	05/03/2017 17:33	WG975972		5
Ethylbenzene	0.00379		0.000535	.93	05/03/2017 17:33	WG975972		⁵ Sr
Total Xylene	0.0779		0.00161	.93	05/03/2017 17:33	WG975972		
TPH (GC/FID) Low Fraction	2.36		0.107	.93	05/03/2017 17:33	WG975972		⁶ Q
(S) a,a,a-Trifluorotoluene(FID)	101		77.0-120		05/03/2017 17:33	WG975972		
(S) a,a,a-Trifluorotoluene(PID)	91.9		75.0-128		05/03/2017 17:33	WG975972		⁷ Gl

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	٦A
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	508		46.0	10	05/02/2017 12:10	WG975037	⁹ Sc
C28-C40 Oil Range	8.00		4.60	1	05/02/2017 10:34	WG975037	SC
(S) o-Terphenyl	72.6		18.0-148		05/02/2017 10:34	WG975037	
(S) o-Terphenyl	63.2		18.0-148		05/02/2017 12:10	WG975037	

#### SAMPLE RESULTS - 05 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	- Cp
Analyte	%			date / time		2
Total Solids	89.4		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Analyte         mg/kg         date / time           Benzene         0.00535         0.000548         .98         05/03/2017 17:55         WG975972           Toluene         0.0218         0.000548         .98         05/03/2017 17:55         WG975972           Ethylbenzene         0.0114         0.000548         .98         05/03/2017 17:55         WG975972           Total Xylene         0.156         0.00164         .98         05/03/2017 17:55         WG975972           TPH (GC/FID) Low Fraction         4.02         0.110         .98         05/03/2017 17:55         WG975972           (Sl a a a Triffungrate/upage(F/D)         0.94         77.0.120         .98         05/03/2017 17:55         WG975972	0.000548         .98         05/03/2017 17:55         WG975972           0.00548         .98         05/03/2017 17:55         WG975972           0.000548         .98         05/03/2017 17:55         WG975972           0.000548         .98         05/03/2017 17:55         WG975972           0.00164         .98         05/03/2017 17:55         WG975972		Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Toluene         0.0218         0.00548         .98         05/03/2017 17:55         WG975972           Ethylbenzene         0.0114         0.000548         .98         05/03/2017 17:55         WG975972           Total Xylene         0.156         0.00164         .98         05/03/2017 17:55         WG975972           TPH (GC/FID) Low Fraction         4.02         0.110         .98         05/03/2017 17:55         WG975972	0.00548       .98       05/03/2017 17:55       WG975972         0.000548       .98       05/03/2017 17:55       WG975972         0.00164       .98       05/03/2017 17:55       WG975972         0.110       .98       05/03/2017 17:55       WG975972         77.0-120       05/03/2017 17:55       WG975972	Analyte	mg/kg		mg/kg		date / time		
Ethylbenzene         0.0114         0.000548         .98         05/03/2017 17:55         WG975972           Total Xylene         0.156         0.00164         .98         05/03/2017 17:55         WG975972           TPH (GC/FID) Low Fraction         4.02         0.110         .98         05/03/2017 17:55         WG975972	0.000548     .98     05/03/2017 17:55     WG975972       0.00164     .98     05/03/2017 17:55     WG975972       0.110     .98     05/03/2017 17:55     WG975972       77.0-120     05/03/2017 17:55     WG975972	Benzene	0.00535		0.000548	.98	05/03/2017 17:55	WG975972	
Total Xylene         0.156         0.00164         .98         05/03/2017 17:55         WG975972           TPH (GC/FID) Low Fraction         4.02         0.110         .98         05/03/2017 17:55         WG975972	0.00164     .98     05/03/2017 17:55     WG975972       0.110     .98     05/03/2017 17:55     WG975972       77.0-120     05/03/2017 17:55     WG975972	Toluene	0.0218		0.00548	.98	05/03/2017 17:55	WG975972	
TPH (GC/FID) Low Fraction         4.02         0.110         .98         05/03/2017 17:55         WG975972	0.110     .98     05/03/2017 17:55     WG975972       77.0-120     05/03/2017 17:55     WG975972	Ethylbenzene	0.0114		0.000548	.98	05/03/2017 17:55	WG975972	
	77.0-120 05/03/2017 17:55 WG975972	Total Xylene	0.156		0.00164	.98	05/03/2017 17:55	WG975972	
(C) a a a Trifluorata/waa/E/D) 00.4 77.0.120 05/02/2017.17-55 WC075072		TPH (GC/FID) Low Fraction	4.02		0.110	.98	05/03/2017 17:55	WG975972	
(3) d, d, d-1111 dol dol dol delle (FID) 53.4 77.0-120 05/05/2017 17.55 W6375372	75.0-128 05/03/2017 17:55 <u>WG975972</u>	(S) a,a,a-Trifluorotoluene(FID)	99.4		77.0-120		05/03/2017 17:55	WG975972	
(S) a,a,a-Trifluorotoluene(PID) 91.8 75.0-128 05/03/2017 17:55 <u>WG975972</u>		(S) a,a,a-Trifluorotoluene(PID)	91.8		75.0-128		05/03/2017 17:55	WG975972	
Semi-Volatile Organic Compounds (GC) by Method 8015			compounds						

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Å
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	67.1		4.48	1	05/02/2017 10:47	WG975037	⁹ SC
C28-C40 Oil Range	ND		4.48	1	05/02/2017 10:47	WG975037	130
(S) o-Terphenyl	62.1		18.0-148		05/02/2017 10:47	WG975037	

#### SAMPLE RESULTS - 06 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	89.2		1	04/28/2017 09:54	WG974587	¯Тс

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Compounds (GC) by Method 8015/8021									
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch			
Analyte	mg/kg		mg/kg		date / time			4 Cr	
Benzene	0.149		0.110	196	05/03/2017 23:15	WG975972			
Toluene	2.98		1.10	196	05/03/2017 23:15	WG975972		5	
Ethylbenzene	2.82		0.110	196	05/03/2017 23:15	WG975972		ຶSr	
Total Xylene	55.5		0.330	196	05/03/2017 23:15	WG975972			
TPH (GC/FID) Low Fraction	1260		22.0	196	05/03/2017 23:15	WG975972			
(S) a,a,a-Trifluorotoluene(FID)	102		77.0-120		05/03/2017 23:15	WG975972			
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		05/03/2017 23:15	WG975972		⁷ Gl	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Å
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	275		4.48	1	05/02/2017 11:01	WG975037	9 50
C28-C40 Oil Range	ND		4.48	1	05/02/2017 11:01	WG975037	
(S) o-Terphenyl	70.2		18.0-148		05/02/2017 11:01	WG975037	

#### SAMPLE RESULTS - 07 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	92.8		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Compounds (GC) by Method 8015/8021									
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch			
Analyte	mg/kg		mg/kg		date / time			4 Cn	
Benzene	66.3		1.33	2475	05/03/2017 23:36	WG975972		CII	
Toluene	392		13.3	2475	05/03/2017 23:36	WG975972		5	
Ethylbenzene	39.8		1.33	2475	05/03/2017 23:36	WG975972		⁵Sr	
Total Xylene	558		4.00	2475	05/03/2017 23:36	WG975972			
TPH (GC/FID) Low Fraction	11400		267	2475	05/03/2017 23:36	WG975972		⁶ Qc	
(S) a,a,a-Trifluorotoluene(FID)	93.5		77.0-120		05/03/2017 23:36	WG975972		QC	
(S) a,a,a-Trifluorotoluene(PID)	103		75.0-128		05/03/2017 23:36	WG975972		⁷ Gl	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Å
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	687		86.2	20	05/02/2017 15:24	WG975037	⁹ Sc
C28-C40 Oil Range	26.7		4.31	1	05/02/2017 15:10	WG975037	150
(S) o-Terphenyl	81.2		18.0-148		05/02/2017 15:10	WG975037	
(S) o-Terphenyl	54.8	<u>J7</u>	18.0-148		05/02/2017 15:24	WG975037	

### SAMPLE RESULTS - 08

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	86.0		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	ND		0.000570	.98	05/03/2017 23:36	WG975972	
Toluene	ND		0.00570	.98	05/03/2017 23:36	WG975972	
Ethylbenzene	ND		0.000570	.98	05/03/2017 23:36	WG975972	
Fotal Xylene	ND		0.00171	.98	05/03/2017 23:36	WG975972	
TPH (GC/FID) Low Fraction	ND		0.114	.98	05/03/2017 23:36	WG975972	
(S) a,a,a-Trifluorotoluene(FID)	101		77.0-120		05/03/2017 23:36	WG975972	
(S) a,a,a-Trifluorotoluene(PID)	92.3		75.0-128		05/03/2017 23:36	WG975972	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	ND		4.65	1	05/02/2017 11:15	<u>WG975037</u>	
C28-C40 Oil Range	ND		4.65	1	05/02/2017 11:15	<u>WG975037</u>	
(S) o-Terphenyl	65.0		18.0-148		05/02/2017 11:15	<u>WG975037</u>	

#### SAMPLE RESULTS - 09 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	86.5		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.00113		0.000567	.98	05/03/2017 19:23	WG975972	
Toluene	ND		0.00567	.98	05/03/2017 19:23	WG975972	
Ethylbenzene	ND		0.000567	.98	05/03/2017 19:23	WG975972	
Total Xylene	0.0444		0.00170	.98	05/03/2017 19:23	WG975972	
TPH (GC/FID) Low Fraction	1.32		0.113	.98	05/03/2017 19:23	WG975972	
(S) a,a,a-Trifluorotoluene(FID)	98.3		77.0-120		05/03/2017 19:23	WG975972	
(S) a,a,a-Trifluorotoluene(PID)	90.1		75.0-128		05/03/2017 19:23	WG975972	

#### ΆI Result (dry) Qualifier RDL (dry) Dilution Analysis Batch date / time Analyte mg/kg mg/kg WG975037 C10-C28 Diesel Range ND 4.63 1 05/02/2017 11:28 Sc WG975037 ND C28-C40 Oil Range 4.63 05/02/2017 11:28 1 (S) o-Terphenyl 72.6 18.0-148 05/02/2017 11:28 WG975037

#### SAMPLE RESULTS - 10 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	84.7		1	04/28/2017 09:54	WG974587	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Analytemg/kgmg/kgdate / timeBenzeneND0.000590105/03/2017 19:45WG975972TolueneND0.00590105/03/2017 19:45WG975972EthylbenzeneND0.000590105/03/2017 19:45WG975972Total Xylene0.01320.00177105/03/2017 19:45WG975972TPH (GC/FID) Low Fraction0.6720.118105/03/2017 19:45WG975972(s) a, a, a-Trifluorotoluene(FID)90.17712075.0-128WG975972(s) a, a, a-Trifluorotoluene(FID)90.175.0-12805/03/2017 19:45WG975972		Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Toluene         ND         0.00590         1         05/03/2017 19:45         WG975972           Ethylbenzene         ND         0.00590         1         05/03/2017 19:45         WG975972           Total Xylene         0.0132         0.00177         1         05/03/2017 19:45         WG975972           TPH (GC/FID) Low Fraction         0.672         0.118         1         05/03/2017 19:45         WG975972           (S) a,a,a-Trifluorotoluene(FID)         98.9         77.0-120         05/03/2017 19:45         WG975972	Analyte	mg/kg		mg/kg		date / time		
Ethylbenzene         ND         0.000590         1         05/03/2017 19:45         WG975972           Total Xylene         0.0132         0.00177         1         05/03/2017 19:45         WG975972           TPH (GC/FID) Low Fraction         0.672         0.118         1         05/03/2017 19:45         WG975972           (S) a,a,a-Trifluorotoluene(FID)         98.9         77.0-120         05/03/2017 19:45         WG975972	Benzene	ND		0.000590	1	05/03/2017 19:45	WG975972	
Total Xylene         0.0132         0.00177         1         05/03/2017 19:45         WG975972           TPH (GC/FID) Low Fraction         0.672         0.118         1         05/03/2017 19:45         WG975972           (S) a, a, a-Trifiuorotoluene(FID)         98.9         77.0-120         05/03/2017 19:45         WG975972	Toluene	ND		0.00590	1	05/03/2017 19:45	WG975972	
TPH (GC/FID) Low Fraction         0.672         0.118         1         05/03/2017 19:45         WG975972           (S) a,a,a-Trifiuorotoluene(FID)         98.9         77.0-120         05/03/2017 19:45         WG975972	Ethylbenzene	ND		0.000590	1	05/03/2017 19:45	WG975972	
(S) a,a,a-Trifluorotoluene(FID) 98.9 77.0-120 05/03/2017 19:45 WG975972	Total Xylene	0.0132		0.00177	1	05/03/2017 19:45	WG975972	
	TPH (GC/FID) Low Fraction	0.672		0.118	1	05/03/2017 19:45	WG975972	
(S) a,a,a-Trifluorotoluene(PID) 90.1 75.0-128 05/03/2017 19:45 <u>WG975972</u>	(S) a,a,a-Trifluorotoluene(FID)	98.9		77.0-120		05/03/2017 19:45	WG975972	
	(S) a,a,a-Trifluorotoluene(PID)	90.1		75.0-128		05/03/2017 19:45	WG975972	
	Semi-Volatile Organic	Compounds	(GC) by IVI	ethoa 8015				

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	ĭΑΙ
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	8.14		4.72	1	05/02/2017 11:42	WG975037	⁹ Sc
C28-C40 Oil Range	ND		4.72	1	05/02/2017 11:42	WG975037	50
(S) o-Terphenyl	58.1		18.0-148		05/02/2017 11:42	WG975037	

#### SAMPLE RESULTS - 11 L905176

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	88.1		1	04/27/2017 15:28	WG974589	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	pounds (GC) k	by Method	8015/8021				Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		⁴ Cn
Benzene	ND		0.114	200	05/03/2017 23:57	WG975972	CII
Toluene	ND		1.14	200	05/03/2017 23:57	WG975972	5
Ethylbenzene	1.59		0.114	200	05/03/2017 23:57	WG975972	⁵Sr
Total Xylene	31.6		0.341	200	05/03/2017 23:57	WG975972	
TPH (GC/FID) Low Fraction	698		22.7	200	05/03/2017 23:57	WG975972	⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	103		77.0-120		05/03/2017 23:57	WG975972	QC
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		05/03/2017 23:57	WG975972	7

#### Sample Narrative:

8015/8021 L905176-11 WG975972: Non-target compounds too high to run at a lower dilution.

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	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Sc
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	120		4.54	1	05/02/2017 11:57	WG975037	
C28-C40 Oil Range	5.29		4.54	1	05/02/2017 11:57	WG975037	
(S) o-Terphenyl	67.2		18.0-148		05/02/2017 11:57	WG975037	

#### SAMPLE RESULTS - 12 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	87.8		1	04/27/2017 15:28	WG974589	¯Тс

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	oounds (GC) k	by Method	8015/8021				³ Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		4
Benzene	0.871		0.114	200	05/03/2017 20:29	WG975972	
Toluene	27.9		1.14	200	05/03/2017 20:29	WG975972	5
Ethylbenzene	6.39		0.114	200	05/03/2017 20:29	WG975972	ິS
Total Xylene	59.5		0.342	200	05/03/2017 20:29	WG975972	
TPH (GC/FID) Low Fraction	1380		22.8	200	05/03/2017 20:29	WG975972	⁶ G
(S) a,a,a-Trifluorotoluene(FID)	90.8		77.0-120		05/03/2017 20:29	WG975972	
(S) a,a,a-Trifluorotoluene(PID)	92.0		75.0-128		05/03/2017 20:29	WG975972	⁷ G

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	277		4.56	1	05/02/2017 13:06	<u>WG975037</u>	
C28-C40 Oil Range	9.51		4.56	1	05/02/2017 13:06	<u>WG975037</u>	
(S) o-Terphenyl	67.5		18.0-148		05/02/2017 13:06	<u>WG975037</u>	

#### SAMPLE RESULTS - 13 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	— Cp
Analyte	%			date / time		2
Total Solids	93.1		1	04/27/2017 15:28	<u>WG974589</u>	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	oounds (GC) b	by Method	8015/8021				³ S
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	L
Analyte	mg/kg		mg/kg		date / time		4
Benzene	5.31		0.104	194	05/03/2017 20:51	WG975972	
Toluene	45.6		1.04	194	05/03/2017 20:51	WG975972	5
Ethylbenzene	8.48		0.104	194	05/03/2017 20:51	WG975972	Č
Total Xylene	70.1		0.313	194	05/03/2017 20:51	WG975972	
TPH (GC/FID) Low Fraction	1950		20.8	194	05/03/2017 20:51	WG975972	6
(S) a,a,a-Trifluorotoluene(FID)	92.3		77.0-120		05/03/2017 20:51	WG975972	`
(S) a,a,a-Trifluorotoluene(PID)	96.1		75.0-128		05/03/2017 20:51	WG975972	7

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	240		4.30	1	05/02/2017 13:18	<u>WG975037</u>	
C28-C40 Oil Range	7.61		4.30	1	05/02/2017 13:18	<u>WG975037</u>	
(S) o-Terphenyl	70.0		18.0-148		05/02/2017 13:18	<u>WG975037</u>	

## SAMPLE RESULTS - 14

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	83.7		1	04/27/2017 15:28	WG974589	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	L
nalyte	mg/kg		mg/kg		date / time		4
lenzene	0.00116		0.000586	.98	05/04/2017 04:25	WG975972	
oluene	ND		0.00586	.98	05/04/2017 04:25	WG975972	5
thylbenzene	0.0175		0.000586	.98	05/04/2017 04:25	WG975972	5
otal Xylene	0.0491		0.00176	.98	05/04/2017 04:25	WG975972	
PH (GC/FID) Low Fraction	0.966		0.116	.97	05/03/2017 21:13	WG975972	6
(S) a,a,a-Trifluorotoluene(FID)	97.9		77.0-120		05/03/2017 21:13	WG975972	
(S) a,a,a-Trifluorotoluene(FID)	100		77.0-120		05/04/2017 04:25	WG975972	7
(S) a,a,a-Trifluorotoluene(PID)	90.1		75.0-128		05/03/2017 21:13	WG975972	,
(S) a.a.a-Trifluorotoluene(PID)	91.3		75.0-128		05/04/2017 04:25	WG975972	L

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	9 6
Analyte	mg/kg		mg/kg		date / time		JU
C10-C28 Diesel Range	ND		4.78	1	05/02/2017 13:33	WG975037	
C28-C40 Oil Range	ND		4.78	1	05/02/2017 13:33	WG975037	
(S) o-Terphenyl	62.7		18.0-148		05/02/2017 13:33	WG975037	

#### SAMPLE RESULTS - 15 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	88.8		1	04/27/2017 15:28	WG974589	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
nalyte	mg/kg		mg/kg		date / time		
Benzene	ND		0.000529	.94	05/03/2017 23:58	WG975972	
oluene	ND		0.00529	.94	05/03/2017 23:58	<u>WG975972</u>	
thylbenzene	ND		0.000529	.94	05/03/2017 23:58	WG975972	
otal Xylene	0.00185	B	0.00159	.94	05/03/2017 23:58	<u>WG975972</u>	
PH (GC/FID) Low Fraction	ND		0.106	.94	05/03/2017 23:58	WG975972	
(S) a,a,a-Trifluorotoluene(FID)	102		77.0-120		05/03/2017 23:58	<u>WG975972</u>	
(S) a,a,a-Trifluorotoluene(PID)	92.0		75.0-128		05/03/2017 23:58	WG975972	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	ľ
Analyte	mg/kg		mg/kg		date / time		l
C10-C28 Diesel Range	ND		4.50	1	05/02/2017 13:46	WG975037	ſ
C28-C40 Oil Range	ND		4.50	1	05/02/2017 13:46	WG975037	
(S) o-Terphenyl	71.0		18.0-148		05/02/2017 13:46	WG975037	

#### SAMPLE RESULTS - 16 L905176

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch		)
Analyte	%			date / time		2	_
Total Solids	89.2		1	04/27/2017 15:28	WG974589	Tc	

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	oounds (GC) k	by Method	8015/8021				³ Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		⁴ Cn
Benzene	ND		0.0277	49.5	05/04/2017 18:39	WG975972	CI
Toluene	ND		0.277	49.5	05/04/2017 18:39	WG975972	5
Ethylbenzene	ND		0.0277	49.5	05/04/2017 18:39	WG975972	ٌSr
Total Xylene	2.04		0.0832	49.5	05/04/2017 18:39	WG975972	
TPH (GC/FID) Low Fraction	61.8		5.55	49.5	05/04/2017 18:39	WG975972	⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	103		77.0-120		05/04/2017 18:39	WG975972	QC
(S) a,a,a-Trifluorotoluene(PID)	93.5		75.0-128		05/04/2017 18:39	WG975972	7

#### Sample Narrative:

8015/8021 L905176-16 WG975972: Non-target compounds too high to run at a lower dilution.

-							Co.
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Sc
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	50.5		4.48	1	05/02/2017 14:00	WG975037	
C28-C40 Oil Range	ND		4.48	1	05/02/2017 14:00	WG975037	
(S) o-Terphenyl	74.5		18.0-148		05/02/2017 14:00	WG975037	

#### SAMPLE RESULTS - 17 L905176

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch		Ср
Analyte	%			date / time		-	2
Total Solids	85.6		1	04/27/2017 15:28	WG974589		Тс

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	pounds (GC) k	by Method	8015/8021				³ Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		⁴ Cn
Benzene	ND		0.0572	98	05/04/2017 19:01	WG975972	CII
Toluene	3.87		0.572	98	05/04/2017 19:01	WG975972	5
Ethylbenzene	2.82		0.0572	98	05/04/2017 19:01	WG975972	ँSr
Total Xylene	29.7		0.172	98	05/04/2017 19:01	WG975972	
TPH (GC/FID) Low Fraction	651		11.4	98	05/04/2017 19:01	WG975972	⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	100		77.0-120		05/04/2017 19:01	WG975972	QC
(S) a,a,a-Trifluorotoluene(PID)	92.2		75.0-128		05/04/2017 19:01	WG975972	7

#### Sample Narrative:

8015/8021 L905176-17 WG975972: Non-target compounds too high to run at a lower dilution.

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	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Sc
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	147		4.67	1	05/02/2017 14:14	WG975037	
C28-C40 Oil Range	ND		4.67	1	05/02/2017 14:14	WG975037	
(S) o-Terphenyl	74.3		18.0-148		05/02/2017 14:14	WG975037	

#### SAMPLE RESULTS - 18 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	80.4		1	04/27/2017 15:28	WG974589	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	oounds (GC) t	by Method	8015/8021				³ S
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	L
Analyte	mg/kg		mg/kg		date / time		4
Benzene	0.525		0.122	196	05/04/2017 01:05	WG975972	
Toluene	10.7		1.22	196	05/04/2017 01:05	WG975972	5
Ethylbenzene	5.23		0.122	196	05/04/2017 01:05	WG975972	ັເ
Total Xylene	55.0		0.366	196	05/04/2017 01:05	WG975972	
TPH (GC/FID) Low Fraction	1270		24.4	196	05/04/2017 01:05	WG975972	6
(S) a,a,a-Trifluorotoluene(FID)	92.5		77.0-120		05/04/2017 01:05	WG975972	
(S) a,a,a-Trifluorotoluene(PID)	91.3		75.0-128		05/04/2017 01:05	WG975972	7

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	ÅI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	286		4.97	1	05/02/2017 14:27	WG975037	°Sc
C28-C40 Oil Range	ND		4.97	1	05/02/2017 14:27	WG975037	50
(S) o-Terphenyl	72.9		18.0-148		05/02/2017 14:27	WG975037	

#### SAMPLE RESULTS - 19 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	88.5		1	04/27/2017 15:28	WG974589	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	oounds (GC) t	by Method	8015/8021				³ Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		4 Cn
Benzene	0.117		0.112	198	05/04/2017 01:27	WG975972	CII
Toluene	10.2		1.12	198	05/04/2017 01:27	WG975972	5
Ethylbenzene	4.63		0.112	198	05/04/2017 01:27	WG975972	⁵Sr
Total Xylene	53.1		0.335	198	05/04/2017 01:27	WG975972	
TPH (GC/FID) Low Fraction	1110		22.4	198	05/04/2017 01:27	WG975972	
(S) a,a,a-Trifluorotoluene(FID)	99.4		77.0-120		05/04/2017 01:27	WG975972	QC
(S) a,a,a-Trifluorotoluene(PID)	90.9		75.0-128		05/04/2017 01:27	WG975972	⁷ Gl

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Å
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	366		4.52	1	05/02/2017 14:41	WG975037	⁹ Sc
C28-C40 Oil Range	ND		4.52	1	05/02/2017 14:41	WG975037	50
(S) o-Terphenyl	82.4		18.0-148		05/02/2017 14:41	WG975037	

#### SAMPLE RESULTS - 20 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch		)
Analyte	%			date / time		2	_
Total Solids	90.3		1	04/27/2017 15:28	WG974589	Tc	2

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	oounds (GC) k	by Method	8015/8021				³ Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		4 Cn
Benzene	0.812		0.0271	49	05/04/2017 19:24	WG975972	
Toluene	3.53		0.271	49	05/04/2017 19:24	WG975972	5
Ethylbenzene	1.16		0.0271	49	05/04/2017 19:24	WG975972	ँSr
Total Xylene	12.5		0.0814	49	05/04/2017 19:24	WG975972	
TPH (GC/FID) Low Fraction	549		5.43	49	05/04/2017 19:24	WG975972	⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	92.4		77.0-120		05/04/2017 19:24	WG975972	QC
(S) a,a,a-Trifluorotoluene(PID)	91.3		75.0-128		05/04/2017 19:24	WG975972	⁷ Gl

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Å
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	25.6		4.43	1	05/02/2017 14:55	WG975037	⁹ Sc
C28-C40 Oil Range	ND		4.43	1	05/02/2017 14:55	WG975037	50
(S) o-Terphenyl	68.4		18.0-148		05/02/2017 14:55	WG975037	

#### SAMPLE RESULTS - 21 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Cp
Analyte	%			date / time		2
Total Solids	88.8		1	04/27/2017 15:05	WG974591	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	ND		0.000552	.98	05/03/2017 03:38	WG975980	
Foluene	ND		0.00552	.98	05/03/2017 03:38	<u>WG975980</u>	
Ethylbenzene	ND		0.000552	.98	05/03/2017 03:38	<u>WG975980</u>	
Fotal Xylene	0.00315	B	0.00165	.98	05/03/2017 03:38	<u>WG975980</u>	
FPH (GC/FID) Low Fraction	ND		0.110	.98	05/03/2017 03:38	<u>WG975980</u>	
(S) a,a,a-Trifluorotoluene(FID)	101		77.0-120		05/03/2017 03:38	<u>WG975980</u>	
(S) a,a,a-Trifluorotoluene(PID)	91.6		75.0-128		05/03/2017 03:38	WG975980	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	Å
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	7.67		4.50	1	05/01/2017 13:39	WG975038	°Sc
C28-C40 Oil Range	ND		4.50	1	05/01/2017 13:39	WG975038	150
(S) o-Terphenyl	94.6		18.0-148		05/01/2017 13:39	WG975038	

#### SAMPLE RESULTS - 22 L905176

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	85.1		1	04/27/2017 15:05	WG974591	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Analyte Benzene	mg/kg					
Benzene		mg/kg		date / time		
DCHZCHC	ND	0.000558	.95	05/03/2017 04:00	WG975980	
Toluene	0.00694	0.00558	.95	05/03/2017 04:00	WG975980	
Ethylbenzene	0.0352	0.000558	.95	05/03/2017 04:00	WG975980	
Total Xylene	0.442	0.00167	.95	05/03/2017 04:00	WG975980	
TPH (GC/FID) Low Fraction	11.5	0.112	.95	05/03/2017 04:00	WG975980	
(S) a,a,a-Trifluorotoluene(FID)	88.9	77.0-120		05/03/2017 04:00	WG975980	
(S) a,a,a-Trifluorotoluene(PID)	91.0	75.0-128		05/03/2017 04:00	WG975980	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	AI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	22.7		4.70	1	05/01/2017 13:53	WG975038	9 SC
C28-C40 Oil Range	ND		4.70	1	05/01/2017 13:53	WG975038	50
(S) o-Terphenyl	95.1		18.0-148		05/01/2017 13:53	WG975038	

#### SAMPLE RESULTS - 23 L905176

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	84.1		1	04/27/2017 15:05	WG974591	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	oounds (GC) k	by Method	8015/8021				Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		4 Cr
Benzene	0.143		0.0147	24.75	05/04/2017 02:33	WG975980	
Toluene	7.02		0.147	24.75	05/04/2017 02:33	WG975980	5
Ethylbenzene	3.79		0.0147	24.75	05/04/2017 02:33	WG975980	⁵Sr
Total Xylene	60.2		0.883	495	05/04/2017 19:46	WG975980	
TPH (GC/FID) Low Fraction	1150		58.9	495	05/04/2017 19:46	WG975980	⁶ Q
(S) a,a,a-Trifluorotoluene(FID)	99.6		77.0-120		05/04/2017 19:46	WG975980	
(S) a,a,a-Trifluorotoluene(PID)	91.5		75.0-128		05/04/2017 02:33	WG975980	7
(S) a,a,a-Trifluorotoluene(PID)	92.2		75.0-128		05/04/2017 19:46	WG975980	Í GI

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		 9 S C
C10-C28 Diesel Range	97.8		4.76	1	05/01/2017 13:26	WG975038	50
C28-C40 Oil Range	ND		4.76	1	05/01/2017 13:26	WG975038	
(S) o-Terphenyl	91.2		18.0-148		05/01/2017 13:26	WG975038	

#### SAMPLE RESULTS - 24 L905176

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	87.1		1	04/27/2017 15:05	WG974591	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	ND		0.115	200	05/03/2017 01:03	WG975980	
Toluene	2.37		1.15	200	05/03/2017 01:03	<u>WG975980</u>	
Ethylbenzene	1.36		0.115	200	05/03/2017 01:03	<u>WG975980</u>	
Total Xylene	17.6		0.344	200	05/03/2017 01:03	<u>WG975980</u>	
TPH (GC/FID) Low Fraction	399		23.0	200	05/03/2017 01:03	<u>WG975980</u>	
(S) a,a,a-Trifluorotoluene(FID)	98.7		77.0-120		05/03/2017 01:03	<u>WG975980</u>	
(S) a,a,a-Trifluorotoluene(PID)	91.0		75.0-128		05/03/2017 01:03	WG975980	

#### Sample Narrative:

8015/8021 L905176-24 WG975980: Non-target compounds too high to run at a lower dilution.

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	169		4.59	1	05/01/2017 12:58	WG975038	
C28-C40 Oil Range	ND		4.59	1	05/01/2017 12:58	WG975038	
(S) o-Terphenyl	99.8		18.0-148		05/01/2017 12:58	WG975038	

## SAMPLE RESULTS - 25

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	— Ср
Analyte	%			date / time		2
Total Solids	88.4		1	04/27/2017 15:05	WG974591	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
nalyte	mg/kg		mg/kg		date / time		
enzene	0.252		0.113	200	05/03/2017 04:44	WG975980	
oluene	11.5		1.13	200	05/03/2017 04:44	WG975980	
hylbenzene	4.43		0.113	200	05/03/2017 04:44	WG975980	
otal Xylene	47.5		0.339	200	05/03/2017 04:44	WG975980	
PH (GC/FID) Low Fraction	997		22.6	200	05/03/2017 04:44	WG975980	
(S) a,a,a-Trifluorotoluene(FID)	94.1		77.0-120		05/03/2017 04:44	WG975980	
(S) a,a,a-Trifluorotoluene(PID)	90.9		75.0-128		05/03/2017 04:44	WG975980	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	AI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	217		4.53	1	05/01/2017 13:12	WG975038	9 50
C28-C40 Oil Range	ND		4.53	1	05/01/2017 13:12	WG975038	50
(S) o-Terphenyl	99.7		18.0-148		05/01/2017 13:12	WG975038	

## SAMPLE RESULTS - 26

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#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	88.6		1	04/27/2017 15:05	<u>WG974591</u>	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	L
Analyte	mg/kg		mg/kg		date / time		4
Benzene	0.107		0.0141	25	05/04/2017 02:55	WG975980	
Toluene	5.72		0.141	25	05/04/2017 02:55	WG975980	5
Ethylbenzene	2.14		0.0141	25	05/04/2017 02:55	WG975980	
Total Xylene	17.2		0.0423	25	05/04/2017 02:55	WG975980	
TPH (GC/FID) Low Fraction	600		56.4	500	05/04/2017 20:08	WG975980	6
(S) a,a,a-Trifluorotoluene(FID)	93.1		77.0-120		05/04/2017 02:55	WG975980	
(S) a,a,a-Trifluorotoluene(FID)	100		77.0-120		05/04/2017 20:08	WG975980	7
(S) a,a,a-Trifluorotoluene(PID)	90.5		75.0-128		05/04/2017 02:55	WG975980	, (
(S) a,a,a-Trifluorotoluene(PID)	92.2		75.0-128		05/04/2017 20:08	WG975980	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	9 5 6
Analyte	mg/kg		mg/kg		date / time		SC
C10-C28 Diesel Range	51.0		4.51	1	05/01/2017 12:31	WG975038	
C28-C40 Oil Range	ND		4.51	1	05/01/2017 12:31	WG975038	
(S) o-Terphenyl	98.5		18.0-148		05/01/2017 12:31	WG975038	

### SAMPLE RESULTS - 27 L905176

# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	90.6		1	04/27/2017 15:05	WG974591	Tc

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
nalyte	mg/kg		mg/kg		date / time		
Benzene	0.0252		0.000535	.97	05/03/2017 05:28	WG975980	
oluene	0.242		0.00535	.97	05/03/2017 05:28	WG975980	
thylbenzene	0.0393		0.000535	.97	05/03/2017 05:28	WG975980	
otal Xylene	0.343		0.00161	.97	05/03/2017 05:28	WG975980	
PH (GC/FID) Low Fraction	5.34		0.107	.97	05/03/2017 05:28	WG975980	
(S) a,a,a-Trifluorotoluene(FID)	88.3		77.0-120		05/03/2017 05:28	WG975980	
(S) a,a,a-Trifluorotoluene(PID)	93.5		75.0-128		05/03/2017 05:28	WG975980	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	ĬAĬ
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	32.9		4.41	1	05/01/2017 11:50	WG975038	9 SC
C28-C40 Oil Range	ND		4.41	1	05/01/2017 11:50	WG975038	50
(S) o-Terphenyl	97.0		18.0-148		05/01/2017 11:50	WG975038	

#### SAMPLE RESULTS - 28 L905176

# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	88.7		1	04/27/2017 15:05	WG974591	Tc

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.000588		0.000563	1	05/03/2017 05:50	WG975980	
Toluene	0.00605		0.00563	1	05/03/2017 05:50	<u>WG975980</u>	
Ethylbenzene	0.00778		0.000563	1	05/03/2017 05:50	<u>WG975980</u>	
Total Xylene	0.150		0.00169	1	05/03/2017 05:50	<u>WG975980</u>	
TPH (GC/FID) Low Fraction	5.52		0.113	1	05/03/2017 05:50	<u>WG975980</u>	
(S) a,a,a-Trifluorotoluene(FID)	95.5		77.0-120		05/03/2017 05:50	<u>WG975980</u>	
(S) a,a,a-Trifluorotoluene(PID)	90.8		75.0-128		05/03/2017 05:50	WG975980	
Semi-Volatile Organic	Compounds	(GC) by Me	ethod 8015				
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	

Analyte	mg/kg	mg/kg		date / time		
C10-C28 Diesel Range	5.26	4.51	1	05/01/2017 12:45	WG975038	⁹ SC
C28-C40 Oil Range	ND	4.51	1	05/01/2017 12:45	WG975038	50
(S) o-Terphenyl	72.5	18.0-148		05/01/2017 12:45	WG975038	

#### SAMPLE RESULTS - 29 L905176

# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	93.9		1	04/27/2017 15:05	WG974591	Tc

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	ND		0.000522	.98	05/04/2017 03:17	WG975980	
Toluene	ND		0.00522	.98	05/04/2017 03:17	WG975980	
Ethylbenzene	ND		0.000522	.98	05/04/2017 03:17	WG975980	
Total Xylene	0.00646		0.00157	.98	05/04/2017 03:17	WG975980	
TPH (GC/FID) Low Fraction	ND		0.104	.98	05/04/2017 03:17	WG975980	
(S) a,a,a-Trifluorotoluene(FID)	101		77.0-120		05/04/2017 03:17	WG975980	
(S) a,a,a-Trifluorotoluene(PID)	91.7		75.0-128		05/04/2017 03:17	WG975980	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	ٌAI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	ND		4.26	1	05/01/2017 12:18	WG975038	⁹ Sc
C28-C40 Oil Range	ND		4.26	1	05/01/2017 12:18	WG975038	150
(S) o-Terphenyl	90.4		18.0-148		05/01/2017 12:18	WG975038	

#### SAMPLE RESULTS - 30 L905176

# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch		Ср
Analyte	%			date / time		-	2
Total Solids	93.1		1	04/27/2017 15:05	WG974591		Tc

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	l
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.000866		0.000521	.97	05/04/2017 03:40	WG975980	
oluene	ND		0.00521	.97	05/04/2017 03:40	WG975980	
thylbenzene	ND		0.000521	.97	05/04/2017 03:40	WG975980	
otal Xylene	0.00464		0.00156	.97	05/04/2017 03:40	WG975980	
PH (GC/FID) Low Fraction	ND		0.104	.97	05/04/2017 03:40	WG975980	
(S) a,a,a-Trifluorotoluene(FID)	101		77.0-120		05/04/2017 03:40	WG975980	
(S) a,a,a-Trifluorotoluene(PID)	92.0		75.0-128		05/04/2017 03:40	<u>WG975980</u>	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	AI	
Analyte	mg/kg		mg/kg		date / time			
C10-C28 Diesel Range	ND		4.30	1	05/01/2017 12:04	WG975038	°Sc	
C28-C40 Oil Range	ND		4.30	1	05/01/2017 12:04	WG975038	50	
(S) o-Terphenyl	98.4		18.0-148		05/01/2017 12:04	WG975038		

# WG974587

Total Solids by Method 2540 G-2011

#### QUALITY CONTROL SUMMARY 1905176-01,02,03,04,05,06,07,08,09,10

#### Method Blank (MB)

(IVID)								
(MB) R3214456-1 04/28/17 09:54								
MB Result	MB Qualifier	MB MDL	1B RDL		2			
%		%			Tc			
0.000								
					³ S			
	4/28/17 09:54 MB Result %	4/28/17 09:54 MB Result <u>MB Qualifier</u> %	4/28/17 09:54 MB Result <u>MB Qualifier</u> MB MDL N % % %	4/28/17 09:54 MB Result MB Qualifier MB MDL MB RDL % % %	4/28/17 09:54 MB Result MB Qualifier MB MDL MB RDL % % %			

#### L905176-01 Original Sample (OS) • Duplicate (DUP)

(OS) L905176-01 04/28/17 09:54 • (DUP) R3214456-3 04/28/17 09:54								
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits		
Analyte	%	%		%		%		
Total Solids	80.9	80.5	1	0.435		5		

# Laboratory Control Sample (LCS)

(LCS) R3214456-2 04/28/17 09:54							
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier		
Analyte	%	%	%	%			
Total Solids	50.0	50.0	99.9	85.0-115			

# WG974589

Total Solids by Method 2540 G-2011

#### QUALITY CONTROL SUMMARY L905176-11,12,13,14,15,16,17,18,19,20

# Method Blank (MB)

(MB) R3214213-1 04/2	27/17 15:28			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.00140			

# L905176-11 Original Sample (OS) • Duplicate (DUP)

(OS) L905176-11 04/27/1	17 15:28 • (DUP) R	3214213-3 04	/27/17 15:2	28		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	88.1	88.1	1	0.0446		5

# Laboratory Control Sample (LCS)

(LCS) R3214213-2 04/2	27/17 15:28				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	99.9	85.0-115	

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DATE/TIME: 05/05/17 14:28

# WG974591

Total Solids by Method 2540 G-2011

### QUALITY CONTROL SUMMARY 1905176-21,22,23,24,25,26,27,28,29,30

# Method Blank (MB)

#### L905176-21 Original Sample (OS) • Duplicate (DUP)

(OS) L905176-21 04/27/17 15:05 • (DUP) R3214212-3 04/27/17 15:05								
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits		
Analyte	%	%		%		%		
Total Solids	88.8	90.0	1	1.30		5		

# Laboratory Control Sample (LCS)

(LCS) R3214212-2 04/27/17 15:05							
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier		
Analyte	%	%	%	%			
Total Solids	50.0	50.0	100	85.0-115			

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# QUALITY CONTROL SUMMARY 1905176-01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20

#### Method Blank (MB)

(MB) R3215427-5	05/03/17 12:29
	MB Result

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000402	Ţ	0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	102			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	93.8			75.0-128

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3215427-1 05/03/17 10:40 • (LCSD) R3215427-2 05/03/17 11:01											-	
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits		/
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%		
Benzene	0.0500	0.0535	0.0504	107	101	71.0-121			6.04	20		8
Toluene	0.0500	0.0540	0.0500	108	99.9	72.0-120			7.69	20		
Ethylbenzene	0.0500	0.0555	0.0522	111	104	76.0-121			6.08	20		C
Total Xylene	0.150	0.176	0.163	117	109	75.0-124			7.44	20		Ĵ
(S) a,a,a-Trifluorotoluer	ne(FID)			101	102	77.0-120						L
(S) a,a,a-Trifluorotoluer	ne(PID)			99.4	101	75.0-128						

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3215427-3 05/03	S) R3215427-3 05/03/17 11:23 • (LCSD) R3215427-4 05/03/17 11:45												
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits			
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%			
TPH (GC/FID) Low Fraction	5.50	6.23	6.22	113	113	70.0-136			0.150	20			
(S) a,a,a-Trifluorotoluene(FID)		104	102	77.0-120									
(S) a,a,a-Trifluorotoluene(PID)			111	110	75.0-128								

# L905176-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L905176-03 05/03/1	OS) L905176-03 05/03/17 13:29 • (MS) R3215427-6 05/03/17 13:51 • (MSD) R3215427-7 05/03/17 15:23													
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits		
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%		
Benzene	0.0549	ND	10.7	11.4	97.0	104	200	10.0-146			7.19	29		
Toluene	0.0549	ND	10.6	11.4	95.4	103	200	10.0-143			7.45	30		
Ethylbenzene	0.0549	0.403	11.3	12.1	98.8	106	200	10.0-147			7.07	31		
Total Xylene	0.165	2.11	37.1	40.4	106	116	200	10.0-149			8.50	30		

ACCOUNT: XTO Energy - San Juan Division PROJECT:

SDG: L905176 DATE/TIME: 05/05/17 14:28 PAGE: 43 of 54 ²Tc ³Ss ⁴Cn ⁵Sr

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# QUALITY CONTROL SUMMARY

L905176-01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18

# L905176-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L905176-03	05/03/17 13:29	• (MS) R3215427-6	05/03/17 13:51	• (MSD) R3215427-7	05/03/17 15:23

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
(S) a,a,a-Trifluorotoluene(FID)					103	102		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					99.8	98.6		75.0-128				

# L905176-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L905176-03 05/03/17	(OS) L905176-03 05/03/17 13:29 • (MS) R3215427-8 05/03/17 15:44 • (MSD) R3215427-9 05/03/17 16:06													
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits		
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%		
TPH (GC/FID) Low Fraction	6.04	401	1620	1600	101	99.4	200	10.0-147			1.03	30		
(S) a,a,a-Trifluorotoluene(FID	1				104	104		77.0-120						
(S) a,a,a-Trifluorotoluene(PID)					111	111		75.0-128						

### QUALITY CONTROL SUMMARY L905176-21,22,23,24,25,26,27,28,29,30

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# Method Blank (MB)

(MB) R3215147-5 05/02/17 22:28											
	MB Result	MB Qualifier	MB MDL	MB RDL							
Analyte	mg/kg		mg/kg	mg/kg							
Benzene	U		0.000120	0.000500							
Toluene	0.000254	Ţ	0.000150	0.00500							
Ethylbenzene	U		0.000110	0.000500							
Total Xylene	U		0.000460	0.00150							
TPH (GC/FID) Low Fraction	U		0.0217	0.100							
(S) a,a,a-Trifluorotoluene(FID)	102			77.0-120							
(S) a,a,a-Trifluorotoluene(PID)	94.2			75.0-128							

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3215147-1 05/02/17 20:38 • (LCSD) R3215147-2 05/02/17 21:00												
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier RPD	RPD Limits	· · · · · · · · · · · · · · · · · · ·		
Analyte	mg/kg	mg/kg	mg/kg	%	%	%		%	%	L		
Benzene	0.0500	0.0470	0.0517	94.0	103	71.0-121		9.51	20	8		
Toluene	0.0500	0.0465	0.0514	93.1	103	72.0-120		9.90	20			
Ethylbenzene	0.0500	0.0483	0.0533	96.6	107	76.0-121		9.78	20			
Total Xylene	0.150	0.151	0.166	101	110	75.0-124		9.29	20			
(S) a,a,a-Trifluorotolue	ene(FID)			100	102	77.0-120				L		
(S) a,a,a-Trifluorotolue	ene(PID)			99.3	101	75.0-128						

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3215147-3 05/02/	S) R3215147-3 05/02/17 21:22 • (LCSD) R3215147-4 05/02/17 21:44													
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits				
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%				
TPH (GC/FID) Low Fraction	5.50	6.35	6.28	115	114	70.0-136			1.17	20				
(S) a,a,a-Trifluorotoluene(FID)		102	103	77.0-120										
(S) a,a,a-Trifluorotoluene(PID)			110	111	75.0-128									

# L905176-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L905176-24 05/03/1	)S) L905176-24 05/03/17 01:03 • (MS) R3215147-6 05/02/17 23:12 • (MSD) R3215147-7 05/02/17 23:35													
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits		
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%		
Benzene	0.0574	ND	11.0	11.9	95.1	103	200	10.0-146			8.28	29		
Toluene	0.0574	2.37	13.0	13.9	92.8	101	200	10.0-143			6.60	30		
Ethylbenzene	0.0574	1.36	12.7	13.6	98.6	107	200	10.0-147			7.18	31		
Total Xylene	0.172	17.6	46.1	48.3	83.0	89.4	200	10.0-149			4.62	30		

	ACCOUNT:											
XTO	Energy - S	an Juan	Division									

PROJECT:

SDG: L905176 DATE/TIME: 05/05/17 14:28 PAGE: 45 of 54

# QUALITY CONTROL SUMMARY L905176-21,22,23,24,25,26,27,28,29,30

# L905176-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

		Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
A	Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
	(S) a,a,a-Trifluorotoluene(FID)					98.9	100		77.0-120				
	(S) a,a,a-Trifluorotoluene(PID)					98.5	101		75.0-128				

# L905176-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L905176-24 05/03/1	vs) L905176-24 05/03/17 01:03 • (MS) R3215147-8 05/02/17 23:57 • (MSD) R3215147-9 05/03/17 00:19											
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPH (GC/FID) Low Fraction	6.31	399	1890	1870	118	117	200	10.0-147			0.870	30
(S) a,a,a-Trifluorotoluene(FIL	))				104	104		77.0-120				
(S) a,a,a-Trifluorotoluene(PIL	))				111	111		75.0-128				

Semi-Volatile Organic Compounds (GC) by Method 8015

# QUALITY CONTROL SUMMARY L905176-01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20

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Method Blank (MB)

Method Blank (M	ю)				
(MB) R3214911-1 05/02	/17 08:44				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/kg		mg/kg	mg/kg	
C10-C28 Diesel Range	U		1.61	4.00	
C28-C40 Oil Range	U		0.274	4.00	
(S) o-Terphenyl	70.1			18.0-148	

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3214911-2 05/02/17 08:58 • (LCSD) R3214911-3 05/02/17 09:11											
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits	
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%	
C10-C28 Diesel Range	60.0	48.8	46.2	81.3	76.9	50.0-150			5.50	20	
(S) o-Terphenyl				77.1	64.3	18.0-148					

#### L905176-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L905176-01 05/02/17	OS) L905176-01 05/02/17 09:26 • (MS) R3214911-4 05/02/17 09:39 • (MSD) R3214911-5 05/02/17 09:53											
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
C10-C28 Diesel Range	74.2	ND	62.8	61.8	84.6	83.3	1	50.0-150			1.54	20
(S) o-Terphenyl					70.5	71.9		18.0-148				

Semi-Volatile Organic Compounds (GC) by Method 8015

# QUALITY CONTROL SUMMARY L905176-21,22,23,24,25,26,27,28,29,30

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Method Blank (MB)

Method Blank (M	в)							
(MB) R3214627-1 05/01/17 09:42								
	MB Result	MB Qualifier	MB MDL	MB RDL				
Analyte	mg/kg		mg/kg	mg/kg				
C10-C28 Diesel Range	U		1.61	4.00				
C28-C40 Oil Range	U		0.274	4.00				
(S) o-Terphenyl	102			18.0-148				

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3214627-2 05/01/17 09:56 • (LCSD) R3214627-3 05/01/17 10:10											
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits	
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%	
C10-C28 Diesel Range	60.0	48.2	48.2	80.3	80.4	50.0-150			0.110	20	
(S) o-Terphenyl				106	98.3	18.0-148					

#### L905386-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L905386-01 05/01/17	DS) L905386-01 05/01/17 17:32 • (MS) R3214627-4 05/01/17 17:45 • (MSD) R3214627-5 05/01/17 18:00											
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
C10-C28 Diesel Range	67.3	480	512	499	47.6	27.0	1	50.0-150	ΕV	EV	2.74	20
(S) o-Terphenyl					115	119		18.0-148				

SDG: L905176

# GLOSSARY OF TERMS

# *

Ср

Тс

Ss

Cn

Sr

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SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL (dry)	Reported Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
В	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
V	The sample concentration is too high to evaluate accurate spike recoveries.

# ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.** * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

#### State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey-NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio-VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
lowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee 14	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

#### Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{r/a} Accreditation not applicable

#### **Our Locations**

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



DATE/TIME: 05/05/17 14:28

F025

	Qu	iote Number			Page \ of	3	-		Ana	lysis	1.1	-	Lab Information
ХТО	James He	TO Contact		(505	XTO Contact Phone # (505) 419 - 0915						12		
ENERGY Western Division	10gan-hix	on extern	BENERON	Results to:				2)- 8015	1		1.4		office Abbreviations
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D. Burns	Sar	Samples on Ice			Turnaround	ampie	1_	DRO, H				Rat	eken = BAK on = RAT eance = PC
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Signature	Gray Area	for Lob Hes Only St		Three Day Std. 5 Bus. Days (by contract) Date Needed			(6	1				)rangeville = OV	
Sample ID	Sample Name	Media	Date	Time	Preservative	No. of Conts.	BTE	TPH					Sample Number
BH-11@20-25		Soil	4/11/11		Cool	2	X	X					L90-5176-01
BH-12@ 0'-10'			9/19/17	1300	1.1	2	1	1				1	66
BH-12@ 10-15			4/19/17	1315		2					1		03
BH - 12 @ 15-20		1	4/19/17	1325		2							04
BH-12@ 20-25			4/19/17			2		10.1	1				05
BH-12@ 25-30'			4/19/17	1400		2						1	06
BH-12@ 30'-35'			4/19/11	1435		2					1.3		the second second second second second second second second second second second second second second second s
BH-13@ 0'-10'	1		4/19/17			2			+	+		-	07
BH-13@10-15	2 P 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		4/19/17			2			-	+ +	-	-	08
BH-13@ 15-20			4/19/17			2	H		-	+	-	-	09
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3H-13@ 25-30			4/19/17	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se		2	H		+	+		-	11
BH-13 @ 30'-35'		V	4/19/12	1635		2		1	+	+			12
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	Qu	iote Numbe	r		Page 2 of	2	F		And	ilysis		Lab Information
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ENERGY Western Division	james_ma	daniel exto	energy,	Results to:			1	- 8015	1			Office Abbreviation
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ignature	Gray Area	s for Lab Us	e Only!				EX- 8	(GRD,				angeville = OV
Sample ID	Sample Name	Media	Date	Time	Preservative	No. of Conts.	BTE	HULL				Sample Number
H-14 @ 15-20'		Soil	4/20/17	0930	Cool	2	X	×	-	+ +		L906176-14
H-14@ 20'-25'			4/20/17	0945		1	1	1	-	++		0105110-10
H-15@0'-10'			4/20/17	1130			Ħ	$\square$		+++		10
H-15@ 10-15			4/20/17	1140			H	H				10
H-15@15-20			4/20/17	1145					-	++		18
H-15@20'-25			4/20/17				+					10
H-15@ 30-32			4/20/11	1320		1.0			-			
H-16@ 0'-10'			4/20/17					$\square$				20
H-16@ 10'-15"			4/20/11				++	++	-	+ +		21
H-16@ 15-20'			and the second division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local division of the local divisio	1440			++		-	++		22
H-16@23-25"			4/20/17				H	++-	+	+ +	-	23
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H-16@27-29	1 1 1 1 F 1		4/20/17	1540			V	1	-	++	-	25
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Count: 60= 402

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E N E R G Y Western Division	James M james me	daniela C		100	Page <u>3</u> of			- I -			
	James_mo	James McDaniel			XTO Contact Phone # (505) 4/9 - 69/5						
CJ Well Site/Location	James_mcdaniel@Xto energy logan_hixon@xto energy API Number			I Result	to: dhencmannelte dbornseltenv		0)-8015		Fo	Office Abbreviations	
Ott Randle #5 OH Randel #5 Collected By	1.20	mples on Ice			irmation Soil Sam Turnaround			,HRO)		Bo	urango = DUR akken = BAK
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	nple Name	Media	Date	Time	Preservative	No. of Conts.	BTEX- 8021	TPH			Sample Number
BH-16@33'-35'	and the second	Soil		1405	Cool	2	X	x			L905176-27
BH-17 @ 20'-25' BH-18 @ 30'-32'			4/21/17		1		1				28
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* Sample ID will be the office and sampler-date-military time FARJM-MMDDYY-1200

Count: 60= 402

	ESC LAB SCIEN	CES		
	Cooler Receipt I	Form		
Client:	XTORNM	SDG	# 1,905	176
Cooler Received/Opened On: 4/7		Temperature:	2.1	
Received By: Rickey Mosley				
Signature: Minhor	72			
panar,			1	
Receipt Check List		NP	Yes	No
COC Seal Present / Intact?			1	
COC Signed / Accurate?	a state of the Second Second	and the second	1	an and
Bottles arrive intact?			1	
Correct bottles used?	の語言のなる時間語語を言語		1	About
Sufficient volume sent?			1	
If Applicable		S. F. A. S.		
VOA Zero headspace?			1	
Preservation Correct / Checked?				



# ANALYTICAL REPORT



# **XTO Energy - San Juan Division**

Sample Delivery Group: Samples Received: Project Number:

Description:

L931528 08/24/2017 30-045-05964 OH Randel #5

Report To:

James McDaniel 382 County Road 3100 Aztec, NM 87410

Entire Report Reviewed By:

Dapline R Richards

Daphne Richards Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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	² Tc	
	³ Ss	
[	⁴ Cn	
	⁵Sr	
	⁶ Qc	
	⁷ Gl	

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SDG: L931528

# SAMPLE SUMMARY

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	SAMPLE SI	JMMA	۲Y	ON	E LAB. NATIONW
FARMW-82117-1010 L931528-01 Solid			Collected by	Collected date/time 08/21/17 10:10	Received date/time 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013214	1	08/24/17 12:32	08/24/17 12:43	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	25	08/24/17 10:52	08/25/17 13:22	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/25/17 14:20	ACM
FARMW-82117-1125 L931528-02 Solid			Collected by	Collected date/time 08/21/17 11:25	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013214	1	08/24/17 12:32	08/24/17 12:43	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1000	08/24/17 10:52	08/25/17 01:18	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	10	08/25/17 00:37	08/25/17 20:00	DMG
FARMW-82217-1100 L931528-03 Solid			Collected by	Collected date/time 08/22/17 11:00	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1013214	1	08/24/17 12:32	08/24/17 12:43	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1000	08/24/17 10:52	08/25/17 01:40	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/25/17 14:35	ACM
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	5	08/25/17 00:37	08/25/17 20:29	DMG
FARMW-82117-1300 L931528-04 Solid			Collected by	Collected date/time 08/21/17 13:00	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013214	1	08/24/17 12:32	08/24/17 12:43	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1000	08/24/17 10:52	08/25/17 02:02	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/25/17 15:18	ACM
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	5	08/25/17 00:37	08/25/17 21:11	DMG
FARMW-82117-1310 L931528-05 Solid			Collected by	Collected date/time 08/21/17 13:10	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013214	1	08/24/17 12:32	08/24/17 12:43	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1000	08/24/17 10:52	08/25/17 02:24	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/25/17 15:32	ACM
FARMW-82117-1325 L931528-06 Solid			Collected by	Collected date/time 08/21/17 13:25	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013214	1	08/24/17 12:32	08/24/17 12:43	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	500	08/24/17 10:52	08/25/17 02:47	LRL

PROJECT: 30-045-05964

SDG: L931528

# SAMPLE SUMMARY

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FARMW-82117-1335 L931528-07 Solid			Collected by	Collected date/time 08/21/17 13:35	Received date/time 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1000	08/24/17 10:52	08/25/17 03:09	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	10	08/25/17 00:37	08/25/17 20:14	DMG
FARMW-82117-1010 L931528-08 Solid			Collected by	Collected date/time 08/21/17 16:10	Received date/time 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1000	08/24/17 10:52	08/25/17 03:31	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	5	08/25/17 00:37	08/25/17 17:39	DMG
-ARMW-82117-1505 L931528-09 Solid			Collected by	Collected date/time 08/21/17 15:05	Received date/time 08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	25	08/24/17 10:52	08/25/17 13:44	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	5	08/25/17 00:37	08/25/17 17:53	DMG
FARMW-82117-1550 L931528-10 Solid			Collected by	Collected date/time 08/21/17 15:50	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	200	08/24/17 10:52	08/25/17 14:07	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	5	08/25/17 00:37	08/25/17 18:07	DMG
FARMW-82217-1310 L931528-11 Solid			Collected by	Collected date/time 08/22/17 13:10	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Fotal Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
/olatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1	08/24/17 10:52	08/25/17 14:29	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/26/17 06:11	DMG
FARMW-82217-1325 L931528-12 Solid			Collected by	Collected date/time 08/22/17 13:25	Received date/tim 08/24/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Fotal Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
-	WG1013435	1	08/24/17 10:52	08/25/17 05:00	LRL
Volatile Organic Compounds (GC) by Method 8015/8021					

PROJECT: 30-045-05964

SDG: L931528

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			Collected by	Collected date/time	Received date/time
FARMW-82217-1450 L931528-13 Solid				08/22/17 14:50	08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	25	08/24/17 10:52	08/25/17 14:51	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/26/17 06:38	DMG
			Collected by	Collected date/time	Received date/tim
FARMW-82217-1320 L931528-14 Solid				08/22/17 13:20	08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	500	08/24/17 10:52	08/25/17 05:44	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	5	08/25/17 00:37	08/25/17 19:04	DMG
			Collected by	Collected date/time	Received date/tim
FARMW-82217-1530 L931528-15 Solid				08/22/17 15:30	08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1	08/24/17 10:52	08/25/17 15:13	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/26/17 09:29	DMG
			Collected by	Collected date/time	Received date/tim
FARMW-82217-1550 L931528-16 Solid				08/22/17 15:50	08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1013216	1	08/24/17 11:59	08/24/17 12:16	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1	08/24/17 10:52	08/25/17 15:35	ACG
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/26/17 09:43	DMG
			Collected by	Collected date/time	Received date/tim
FARMW-82217-1025 L931528-17 Solid				08/22/17 10:25	08/24/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1013217	1	08/24/17 12:16	08/24/17 12:29	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1013435	1000	08/24/17 10:52	08/25/17 06:29	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1013319	1	08/25/17 00:37	08/26/17 14:57	DMG

SDG: L931528

# CASE NARRATIVE

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Japline R Richards

Daphne Richards Technical Service Representative

SDG: L931528 DATE/TIME: 08/29/17 14:54 PAGE: 6 of 33

#### FARMW-82117-1010 Collected date/time: 08/21/17 10:10

#### SAMPLE RESULTS - 01 L931528

# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	89.0		1	08/24/2017 12:43	WG1013214	ЪС

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.0138		0.0125	25	08/25/2017 13:22	WG1013435	
Toluene	ND		0.125	25	08/25/2017 13:22	WG1013435	
Ethylbenzene	ND		0.0125	25	08/25/2017 13:22	WG1013435	
Total Xylene	2.34		0.0375	25	08/25/2017 13:22	<u>WG1013435</u>	
TPH (GC/FID) Low Fraction	96.9		2.50	25	08/25/2017 13:22	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	95.1		77.0-120		08/25/2017 13:22	<u>WG1013435</u>	
(S) a,a,a-Trifluorotoluene(PID)	106		75.0-128		08/25/2017 13:22	WG1013435	
Semi-Volatile Organic	Compoun	ds (GC) by	Method 80	15			
	Result	Qualifier	RDI	Dilution	Analysis	Batch	

	Result	Qualifier	RDL	Dilution	Analysis	Batch	AI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	150		4.00	1	08/25/2017 14:20	WG1013319	°Sc
C28-C40 Oil Range	13.8		4.00	1	08/25/2017 14:20	WG1013319	50
(S) o-Terphenyl	96.5		18.0-148		08/25/2017 14:20	WG1013319	

#### FARMW-82117-1125 Collected date/time: 08/21/17 11:25

#### SAMPLE RESULTS - 02 L931528

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	85.6		1	08/24/2017 12:43	WG1013214	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	pounds (GC	C) by Metho	d 8015/802	21			Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		⁴Cn
Benzene	21.1		0.500	1000	08/25/2017 01:18	WG1013435	CII
Toluene	125		5.00	1000	08/25/2017 01:18	WG1013435	5
Ethylbenzene	18.8		0.500	1000	08/25/2017 01:18	WG1013435	Sr
Total Xylene	152		1.50	1000	08/25/2017 01:18	WG1013435	
TPH (GC/FID) Low Fraction	4170		100	1000	08/25/2017 01:18	WG1013435	⁶ Oc
(S) a,a,a-Trifluorotoluene(FID)	89.8		77.0-120		08/25/2017 01:18	WG1013435	
(S) a,a,a-Trifluorotoluene(PID)	104		75.0-128		08/25/2017 01:18	WG1013435	7

#### Sample Narrative:

L931528-02 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

# Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	421		40.0	10	08/25/2017 20:00	WG1013319	
C28-C40 Oil Range	ND		40.0	10	08/25/2017 20:00	WG1013319	
(S) o-Terphenyl	85.2		18.0-148		08/25/2017 20:00	WG1013319	

#### FARMW-82217-1100 Collected date/time: 08/22/17 11:00

#### SAMPLE RESULTS - 03 L931528

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	92.8		1	08/24/2017 12:43	WG1013214	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	Volatile Organic Compounds (GC) by Method 8015/8021							
	Result	Qualifier	RDL	Dilution	Analysis	Batch	[	
Analyte	mg/kg		mg/kg		date / time			⁴ Cn
Benzene	2.26		0.500	1000	08/25/2017 01:40	WG1013435		CII
Toluene	32.9		5.00	1000	08/25/2017 01:40	WG1013435		5
Ethylbenzene	9.64		0.500	1000	08/25/2017 01:40	WG1013435		⁵Sr
Total Xylene	80.8		1.50	1000	08/25/2017 01:40	WG1013435		
TPH (GC/FID) Low Fraction	1600		100	1000	08/25/2017 01:40	WG1013435		
(S) a,a,a-Trifluorotoluene(FID)	81.2		77.0-120		08/25/2017 01:40	WG1013435		QC
(S) a,a,a-Trifluorotoluene(PID)	106		75.0-128		08/25/2017 01:40	WG1013435	ſ	7

#### Sample Narrative:

L931528-03 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

# Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	392	$\underline{\vee}$	20.0	5	08/25/2017 20:29	WG1013319
C28-C40 Oil Range	9.83		4.00	1	08/25/2017 14:35	<u>WG1013319</u>
(S) o-Terphenyl	106		18.0-148		08/25/2017 14:35	<u>WG1013319</u>
(S) o-Terphenyl	87.5		18.0-148		08/25/2017 20:29	WG1013319

#### FARMW-82117-1300 Collected date/time: 08/21/17 13:00

#### SAMPLE RESULTS - 04 L931528

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	87.0		1	08/24/2017 12:43	WG1013214	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Compounds (GC) by Method 8015/8021								Ss
	Result	Qualifier	RDL	Dilution	Analysis	Batch	[	
Analyte	mg/kg		mg/kg		date / time			⁴ Cn
Benzene	ND		0.500	1000	08/25/2017 02:02	WG1013435		CII
Toluene	5.39		5.00	1000	08/25/2017 02:02	WG1013435	The second second second second second second second second second second second second second second second se	5
Ethylbenzene	ND		0.500	1000	08/25/2017 02:02	WG1013435		⁵Sr
Total Xylene	81.7		1.50	1000	08/25/2017 02:02	<u>WG1013435</u>		
TPH (GC/FID) Low Fraction	1710		100	1000	08/25/2017 02:02	WG1013435		
(S) a,a,a-Trifluorotoluene(FID)	93.4		77.0-120		08/25/2017 02:02	WG1013435		
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		08/25/2017 02:02	WG1013435	r	7

#### Sample Narrative:

L931528-04 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

# Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	457		20.0	5	08/25/2017 21:11	WG1013319	
C28-C40 Oil Range	14.0		4.00	1	08/25/2017 15:18	WG1013319	
(S) o-Terphenyl	90.5		18.0-148		08/25/2017 21:11	WG1013319	
(S) o-Terphenyl	88.8		18.0-148		08/25/2017 15:18	WG1013319	

SDG: L931528

#### FARMW-82117-1310 Collected date/time: 08/21/17 13:10

# SAMPLE RESULTS - 05

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	89.6		1	08/24/2017 12:43	WG1013214	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

							55
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		⁴ Cn
Benzene	2.47		0.500	1000	08/25/2017 02:24	WG1013435	
Toluene	29.1		5.00	1000	08/25/2017 02:24	WG1013435	5
Ethylbenzene	8.57		0.500	1000	08/25/2017 02:24	WG1013435	ଁSr
Total Xylene	72.7		1.50	1000	08/25/2017 02:24	WG1013435	
TPH (GC/FID) Low Fraction	1880		100	1000	08/25/2017 02:24	WG1013435	⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	89.8		77.0-120		08/25/2017 02:24	WG1013435	QC
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		08/25/2017 02:24	WG1013435	7

#### Sample Narrative:

L931528-05 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

# Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	325		4.00	1	08/25/2017 15:32	WG1013319	
C28-C40 Oil Range	8.88		4.00	1	08/25/2017 15:32	WG1013319	
(S) o-Terphenyl	95.3		18.0-148		08/25/2017 15:32	WG1013319	

SDG: L931528

#### FARMW-82117-1325 Collected date/time: 08/21/17 13:25

#### SAMPLE RESULTS - 06 L931528

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	79.3		1	08/24/2017 12:43	WG1013214	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	Volatile Organic Compounds (GC) by Method 8015/8021									
	Result	Qualifier	RDL	Dilution	Analysis	Batch				
Analyte	mg/kg		mg/kg		date / time		⁴ Cr			
Benzene	28.1		0.250	500	08/25/2017 02:47	WG1013435				
Toluene	123		2.50	500	08/25/2017 02:47	WG1013435	5			
Ethylbenzene	13.9		0.250	500	08/25/2017 02:47	WG1013435	⁵ Sr			
Total Xylene	114		0.750	500	08/25/2017 02:47	WG1013435				
TPH (GC/FID) Low Fraction	3620		50.0	500	08/25/2017 02:47	WG1013435	⁶ Qo			
(S) a,a,a-Trifluorotoluene(FID)	85.8		77.0-120		08/25/2017 02:47	WG1013435				
(S) a,a,a-Trifluorotoluene(PID)	102		75.0-128		08/25/2017 02:47	WG1013435	7			

#### Sample Narrative:

L931528-06 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

# Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	95.8		20.0	5	08/25/2017 17:25	WG1013319	
C28-C40 Oil Range	ND		20.0	5	08/25/2017 17:25	WG1013319	
(S) o-Terphenyl	80.0		18.0-148		08/25/2017 17:25	WG1013319	

#### FARMW-82117-1335 Collected date/time: 08/21/17 13:35

# SAMPLE RESULTS - 07

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	91.7		1	08/24/2017 12:16	WG1013216	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

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	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		4 Cp
Benzene	10.3		0.500	1000	08/25/2017 03:09	WG1013435	
Toluene	131		5.00	1000	08/25/2017 03:09	WG1013435	5
Ethylbenzene	26.8		0.500	1000	08/25/2017 03:09	WG1013435	[°] Sr
Total Xylene	219		1.50	1000	08/25/2017 03:09	WG1013435	
TPH (GC/FID) Low Fraction	4810		100	1000	08/25/2017 03:09	WG1013435	⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	90.4		77.0-120		08/25/2017 03:09	WG1013435	QC
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		08/25/2017 03:09	WG1013435	7

#### Sample Narrative:

L931528-07 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

# Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	842		40.0	10	08/25/2017 20:14	WG1013319	
C28-C40 Oil Range	ND		40.0	10	08/25/2017 20:14	<u>WG1013319</u>	
(S) o-Terphenyl	88.1		18.0-148		08/25/2017 20:14	WG1013319	

#### FARMW-82117-1010 Collected date/time: 08/21/17 16:10

#### SAMPLE RESULTS - 08 L931528

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	81.6		1	08/24/2017 12:16	WG1013216	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	Volatile Organic Compounds (GC) by Method 8015/8021									
	Result	Qualifier	RDL	Dilution	Analysis	Batch				
Analyte	mg/kg		mg/kg		date / time					
Benzene	3.50		0.500	1000	08/25/2017 03:31	WG1013435				
Toluene	25.6		5.00	1000	08/25/2017 03:31	WG1013435				
Ethylbenzene	4.42		0.500	1000	08/25/2017 03:31	WG1013435				
Total Xylene	39.3		1.50	1000	08/25/2017 03:31	WG1013435				
TPH (GC/FID) Low Fraction	1250		100	1000	08/25/2017 03:31	WG1013435				
(S) a,a,a-Trifluorotoluene(FID)	90.6		77.0-120		08/25/2017 03:31	WG1013435				
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		08/25/2017 03:31	WG1013435				

#### Sample Narrative:

L931528-08 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

# Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	92.7		20.0	5	08/25/2017 17:39	WG1013319	
C28-C40 Oil Range	ND		20.0	5	08/25/2017 17:39	WG1013319	
(S) o-Terphenyl	70.5		18.0-148		08/25/2017 17:39	WG1013319	

SDG: L931528

## FARMW-82117-1505 Collected date/time: 08/21/17 15:05

### SAMPLE RESULTS - 09 L931528

# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	86.9		1	08/24/2017 12:16	<u>WG1013216</u>	Tc

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.0142		0.0125	25	08/25/2017 13:44	WG1013435	
Toluene	ND		0.125	25	08/25/2017 13:44	WG1013435	
Ethylbenzene	ND		0.0125	25	08/25/2017 13:44	WG1013435	
Total Xylene	0.859		0.0375	25	08/25/2017 13:44	WG1013435	
TPH (GC/FID) Low Fraction	82.5		2.50	25	08/25/2017 13:44	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	92.8		77.0-120		08/25/2017 13:44	<u>WG1013435</u>	
(S) a,a,a-Trifluorotoluene(PID)	106		75.0-128		08/25/2017 13:44	WG1013435	
Semi-Volatile Organic	Compoun	ds (GC) by	Method 80	)15			
	Result	Qualifier	RDI	Dilution	Analysis	Batch	

	Result	Qualifier	RDL	Dilution	Analysis	Batch	A
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	64.1		20.0	5	08/25/2017 17:53	WG1013319	9 50
C28-C40 Oil Range	ND		20.0	5	08/25/2017 17:53	WG1013319	SC
(S) o-Terphenyl	88.0		18.0-148		08/25/2017 17:53	WG1013319	

#### FARMW-82117-1550 Collected date/time: 08/21/17 15:50

#### SAMPLE RESULTS - 10 L931528

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	90.9		1	08/24/2017 12:16	<u>WG1013216</u>	Tc

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.841		0.100	200	08/25/2017 14:07	WG1013435	
Toluene	22.7		1.00	200	08/25/2017 14:07	WG1013435	
Ethylbenzene	7.02		0.100	200	08/25/2017 14:07	WG1013435	
Total Xylene	58.4		0.300	200	08/25/2017 14:07	WG1013435	
TPH (GC/FID) Low Fraction	1430		20.0	200	08/25/2017 14:07	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	88.9		77.0-120		08/25/2017 14:07	WG1013435	
(S) a,a,a-Trifluorotoluene(PID)	104		75.0-128		08/25/2017 14:07	WG1013435	
Semi-Volatile Organic	Compoun	ds (GC) by	Method 80	)15			
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
A	·····		·····		1 1 1 1		

	Result	Quanner	NDL	Dilution	Analysis	Daten	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	360		20.0	5	08/25/2017 18:07	WG1013319	9 50
C28-C40 Oil Range	ND		20.0	5	08/25/2017 18:07	WG1013319	50
(S) o-Terphenyl	92.0		18.0-148		08/25/2017 18:07	WG1013319	

#### FARMW-82217-1310 Collected date/time: 08/22/17 13:10

C28-C40 Oil Range

(S) o-Terphenyl

#### SAMPLE RESULTS - 11 L931528

# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	85.8		1	08/24/2017 12:16	WG1013216	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

ND

94.6

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.0192		0.000500	1	08/25/2017 14:29	WG1013435	
Toluene	0.0386		0.00500	1	08/25/2017 14:29	WG1013435	
Ethylbenzene	0.00242		0.000500	1	08/25/2017 14:29	WG1013435	
Total Xylene	0.0229		0.00150	1	08/25/2017 14:29	<u>WG1013435</u>	
TPH (GC/FID) Low Fraction	0.470		0.100	1	08/25/2017 14:29	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	93.5		77.0-120		08/25/2017 14:29	<u>WG1013435</u>	
(S) a,a,a-Trifluorotoluene(PID)	102		75.0-128		08/25/2017 14:29	WG1013435	
Semi-Volatile Organic	Compound	ls (GC) by	Method 80	15			
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	ND		4.00	1	08/26/2017 06:11	WG1013319	
C29 C40 Oil Bango	ND		1.00	1	00/26/2017 06.11	WC1012210	

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08/26/2017 06:11

08/26/2017 06:11

4.00

18.0-148

WG1013319

WG1013319

#### FARMW-82217-1325 Collected date/time: 08/22/17 13:25

C28-C40 Oil Range

(S) o-Terphenyl

#### SAMPLE RESULTS - 12 L931528

### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	93.6		1	08/24/2017 12:16	WG1013216	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

ND

106

	Result	Qualifier	RDL	Dilution	Analysis	Batch	[
Analyte	mg/kg		mg/kg		date / time		-
Benzene	0.00512		0.000500	1	08/25/2017 05:00	WG1013435	
Toluene	0.0102		0.00500	1	08/25/2017 05:00	WG1013435	
Ethylbenzene	0.00133	B	0.000500	1	08/25/2017 05:00	WG1013435	
Total Xylene	0.00697	В	0.00150	1	08/25/2017 05:00	WG1013435	
TPH (GC/FID) Low Fraction	0.195		0.100	1	08/25/2017 05:00	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	94.7		77.0-120		08/25/2017 05:00	WG1013435	
(S) a,a,a-Trifluorotoluene(PID)	103		75.0-128		08/25/2017 05:00	WG1013435	
Semi-Volatile Organic	Compound	ls (GC) by	Method 80	15			L
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		L
C10-C28 Diesel Range	ND		4.00	1	08/26/2017 06:25	WG1013319	
C29 C40 Oil Dango	ND		1.00	1	00/26/2017 06:25	WC1012210	

1

08/26/2017 06:25

08/26/2017 06:25

4.00

18.0-148

WG1013319

WG1013319

#### FARMW-82217-1450 Collected date/time: 08/22/17 14:50

#### SAMPLE RESULTS - 13 L931528

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	84.5		1	08/24/2017 12:16	WG1013216	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result	Qualifier	RDL	Dilution	Analysis	Batch	L
Analyte	mg/kg		mg/kg		date / time		4
Benzene	0.276		0.0125	25	08/25/2017 14:51	WG1013435	
Toluene	0.517		0.125	25	08/25/2017 14:51	WG1013435	
Ethylbenzene	0.517		0.0125	25	08/25/2017 14:51	WG1013435	
Total Xylene	3.80		0.0375	25	08/25/2017 14:51	WG1013435	
TPH (GC/FID) Low Fraction	180		2.50	25	08/25/2017 14:51	WG1013435	6
(S) a,a,a-Trifluorotoluene(FID)	89.6		77.0-120		08/25/2017 14:51	WG1013435	
(S) a,a,a-Trifluorotoluene(PID)	103		75.0-128		08/25/2017 14:51	WG1013435	[
Semi-Volatile Organic	Compound	ds (GC) by	Method 80	15			L
	Result	Qualifier	RDL	Dilution	Analysis	Batch	

	Result	Qualifier	RDL	Dilution	Analysis	Batch	AI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	40.8		4.00	1	08/26/2017 06:38	WG1013319	⁹ SC
C28-C40 Oil Range	ND		4.00	1	08/26/2017 06:38	WG1013319	50
(S) o-Terphenyl	92.9		18.0-148		08/26/2017 06:38	WG1013319	

SDG: L931528

#### FARMW-82217-1320 Collected date/time: 08/22/17 13:20

#### SAMPLE RESULTS - 14 L931528

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# Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	89.7		1	08/24/2017 12:16	WG1013216	Tc

# Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Com	bounds (GC	) by Metho	d 8015/80	21			
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Senzene	0.462		0.250	500	08/25/2017 05:44	WG1013435	
luene	4.82		2.50	500	08/25/2017 05:44	WG1013435	
hylbenzene	3.17		0.250	500	08/25/2017 05:44	WG1013435	
tal Xylene	37.4		0.750	500	08/25/2017 05:44	WG1013435	
PH (GC/FID) Low Fraction	1000		50.0	500	08/25/2017 05:44	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	88.3		77.0-120		08/25/2017 05:44	WG1013435	
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		08/25/2017 05:44	WG1013435	

#### Sample Narrative:

L931528-14 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

#### Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	483		20.0	5	08/25/2017 19:04	<u>WG1013319</u>	
C28-C40 Oil Range	ND		20.0	5	08/25/2017 19:04	<u>WG1013319</u>	
(S) o-Terphenyl	88.5		18.0-148		08/25/2017 19:04	WG1013319	

SDG: L931528

DATE/TIME: 08/29/17 14:54

#### FARMW-82217-1530 Collected date/time: 08/22/17 15:30

C28-C40 Oil Range

(S) o-Terphenyl

#### SAMPLE RESULTS - 15 L931528

### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	— Ср
Analyte	%			date / time		2
Total Solids	84.0		1	08/24/2017 12:16	<u>WG1013216</u>	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

ND

89.7

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.00431		0.000500	1	08/25/2017 15:13	WG1013435	
Toluene	0.00854		0.00500	1	08/25/2017 15:13	WG1013435	
Ethylbenzene	ND		0.000500	1	08/25/2017 15:13	WG1013435	
Total Xylene	0.00915		0.00150	1	08/25/2017 15:13	WG1013435	
TPH (GC/FID) Low Fraction	0.532		0.100	1	08/25/2017 15:13	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	92.3		77.0-120		08/25/2017 15:13	WG1013435	
(S) a,a,a-Trifluorotoluene(PID)	101		75.0-128		08/25/2017 15:13	WG1013435	
Semi-Volatile Organic	Compound	ls (GC) by	Method 80	15			
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	ND		4.00	1	08/26/2017 09:29	<u>WG1013319</u>	
C29 C40 Oil Bango	ND		1.00	1	00/26/2017 00.20	WC1012210	

1

08/26/2017 09:29

08/26/2017 09:29

4.00

18.0-148

WG1013319

WG1013319

SDG: L931528

#### FARMW-82217-1550 Collected date/time: 08/22/17 15:50

C28-C40 Oil Range

(S) o-Terphenyl

#### SAMPLE RESULTS - 16 L931528

### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch		Ср
Analyte	%			date / time		2	>
Total Solids	88.2		1	08/24/2017 12:16	WG1013216	2	Тс

#### Volatile Organic Compounds (GC) by Method 8015/8021

ND

90.8

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.00369		0.000500	1	08/25/2017 15:35	WG1013435	
Toluene	0.00711		0.00500	1	08/25/2017 15:35	WG1013435	
Ethylbenzene	0.000684	B	0.000500	1	08/25/2017 15:35	WG1013435	
Total Xylene	0.00471		0.00150	1	08/25/2017 15:35	WG1013435	
TPH (GC/FID) Low Fraction	0.161		0.100	1	08/25/2017 15:35	WG1013435	
(S) a,a,a-Trifluorotoluene(FID)	92.3		77.0-120		08/25/2017 15:35	WG1013435	
(S) a,a,a-Trifluorotoluene(PID)	101		75.0-128		08/25/2017 15:35	WG1013435	
Semi-Volatile Organic	Compound	s (GC) by	Method 80	15			l
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		l
C10-C28 Diesel Range	ND		4.00	1	08/26/2017 09:43	WG1013319	
C29 C40 Oil Bango	ND		1.00	1	00/26/2017 00.42	WC1012210	

1

08/26/2017 09:43

08/26/2017 09:43

4.00

18.0-148

WG1013319

WG1013319

#### FARMW-82217-1025 Collected date/time: 08/22/17 10:25

# SAMPLE RESULTS - 17

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## Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	85.7		1	08/24/2017 12:29	WG1013217	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

							55
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		4 Cn
Benzene	12.7		0.500	1000	08/25/2017 06:29	WG1013435	CII
Toluene	90.9		5.00	1000	08/25/2017 06:29	WG1013435	5
Ethylbenzene	15.7		0.500	1000	08/25/2017 06:29	WG1013435	ँSr
Total Xylene	128		1.50	1000	08/25/2017 06:29	WG1013435	
TPH (GC/FID) Low Fraction	3310		100	1000	08/25/2017 06:29	WG1013435	⁶ Qc
(S) a,a,a-Trifluorotoluene(FID)	90.9		77.0-120		08/25/2017 06:29	WG1013435	QC
(S) a,a,a-Trifluorotoluene(PID)	104		75.0-128		08/25/2017 06:29	WG1013435	7

#### Sample Narrative:

L931528-17 WG1013435: Target and Non-target compounds too high to run at a lower dilution.

#### Semi-Volatile Organic Compounds (GC) by Method 8015

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	336		4.00	1	08/26/2017 14:57	WG1013319	
C28-C40 Oil Range	5.44		4.00	1	08/26/2017 14:57	WG1013319	
(S) o-Terphenyl	94.6		18.0-148		08/26/2017 14:57	WG1013319	

SDG: L931528 DATE/TIME: 08/29/17 14:54

Total Solids by Method 2540 G-2011

# QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3244383-1 08/2	24/17 12:43			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.000			

#### L931528-03 Original Sample (OS) • Duplicate (DUP)

(OS) L931528-03 08/24/1	17 12:43 • (DUP)	R3244383-3	08/24/17 12	2:43		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	92.8	92.5	1	0.281		5

#### Laboratory Control Sample (LCS)

(LCS) R3244383-2 08/	/24/17 12:43				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

PROJECT: 30-045-05964

SDG: L931528 DATE/TIME: 08/29/17 14:54 PAGE: 24 of 33

Total Solids by Method 2540 G-2011

#### QUALITY CONTROL SUMMARY L931528-07,08,09,10,11,12,13,14,15,16

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#### Method Blank (MB)

Method Blank	(IVIB)				
MB) R3244382-1 08	3/24/17 12:16				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	%		%	%	
Total Solids	0.000500				

#### L931528-11 Original Sample (OS) • Duplicate (DUP)

(OS) L931528-11 08/24/17	12:16 • (DUP) R3	3244382-3 08	3/24/17 12:'	16		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	85.8	85.7	1	0.0906		5

#### Laboratory Control Sample (LCS)

(LCS) R3244382-2 08	3/24/17 12:16				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

SDG: L931528

DATE/TIME: 08/29/17 14:54

PAGE: 25 of 33

Total Solids by Method 2540 G-2011

# QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3244380-1 08/2	24/17 12:29			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.000100			

#### L931563-01 Original Sample (OS) • Duplicate (DUP)

(OS) L931563-01 08/24/17	7 12:29 • (DUP) F	3244380-3	38/24/17 12	2:29		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	95.3	93.1	1	2.38		5

#### Laboratory Control Sample (LCS)

(LCS) R3244380-2 08/	/24/17 12:29				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

SDG: L931528 DATE/TIME: 08/29/17 14:54 PAGE: 26 of 33

Volatile Organic Compounds (GC) by Method 8015/8021

# QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3244430-5 08/24	/17 23:50			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000534	J	0.000150	0.00500
Ethylbenzene	0.000239	J	0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	95.9			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	105			75.0-128

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3244430-1 08/24/17 21:59 • (LCSD) R3244430-2 08/24/17 22:21										
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Benzene	0.0500	0.0457	0.0492	91.5	98.3	71.0-121			7.23	20
Toluene	0.0500	0.0472	0.0498	94.3	99.5	72.0-120			5.34	20
Ethylbenzene	0.0500	0.0459	0.0490	91.8	97.9	76.0-121			6.51	20
Total Xylene	0.150	0.135	0.142	89.7	94.7	75.0-124			5.50	20
(S) a,a,a-Trifluorotoluene(FID)				95.7	95.9	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				104	104	75.0-128				

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3244430-3 08/24/17 22:43 • (LCSD) R3244430-4 08/24/17 23:05											
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits	
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%	
TPH (GC/FID) Low Fraction	5.50	5.58	5.67	102	103	70.0-136			1.47	20	
(S) a,a,a-Trifluorotoluene(FID)				107	109	77.0-120					
(S) a,a,a-Trifluorotoluene(PID)				119	120	75.0-128					

ACCOUNT:					
XTO Energy - San Juan Division					

PROJECT: 30-045-05964

SDG: L931528 DATE/TIME: 08/29/17 14:54 PAGE: 27 of 33

Semi-Volatile Organic Compounds (GC) by Method 8015

# QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R3244529-1 08/25	5/17 10:20			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	100			18.0-148

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3244529-2 08/	25/17 10:34 • (LCS	D) R3244529	-3 08/25/17 10:	48						
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
C10-C28 Diesel Range	60.0	46.5	44.2	77.5	73.7	50.0-150			5.03	20
(S) o-Terphenyl				94.8	101	18.0-148				

DATE/TIME: 08/29/17 14:54 GI

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# GLOSSARY OF TERMS

Abbreviations and Definitions

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¹ Cp
² Tc
³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
В	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
V	The sample concentration is too high to evaluate accurate spike recoveries.

SDG: L931528 DATE/TIME: 08/29/17 14:54

# ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.** * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

#### State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey-NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio-VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
lowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee 14	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

#### Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

#### **Our Locations**

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



ACCOUNT: XTO Energy - San Juan Division PROJECT: 30-045-05964

SDG: L931528 DATE/TIME: 08/29/17 14:54

	0	uote Numi XTO	ber		Page 1 of 2			And	alysis	La	ab Information	
ЖТО	118.	TO Contac mes McDa	niel		O Contact Pho 505-333-370							
Western Division	M	James Nicker@L1	Email Res _McDaniel@ TEnv.com & d	<b>XTOener</b>	gy.com nn@ltenv.com						e Abbreviations on = FAR	
Well Site/Location OH Randel #5		API Numbe			Test Reason		1	ARO A		Durango	= DUR	
Collected By		s on Ice	(Y / N)	24-	Quarterly GV Turnaround Hour			RO/N		Raton = F	AT	
Company LT Environmental, Inc.	QA	VQC RequestedX		X	Next Day Day te Day		1	(Gro/DRO/MRO)		Piceance Roosevell La Barge	= RSV = LB	
MM	Gray Are	as for Lab	Use Only!		Bus. Days(by	contract)	BTEX 8021	8015B		Orangevi	lle = ov [93/528 3239	
Sample ID Sa	mple Name	Media	Date	Time	Preservative	No. of Conts.	STEX	HdT		-		
ARMW- 82/17-1010 BA	-20G20-2	S Soil	8/21/7	1010	Cool	1	X	x		Jan	nple Number	
ARMW- 82117 -1125 BH-2	00,40-45	Soil	8/21/17	1125	Cool	1	X	X		10000000000	-01	
ARMW- 82217-1150 BIT-2	00, 100-65	Soil	8/22/17	100	Cool		X	X			.03	
ARMW-82/17-1350 BH2	1 a 10-15	Soil	8/21/17	1300	Cool		X	X			- 04	
ARMW-82117-1310 BHZ	1925-30	Soil	8/21/17	13/0	Cool		X	X				
ARMW-82117 -1325 BH2	1930-35	Soil	8/21/17	1325	Cool		X	X		Thereit	- 05	
ARMW-82117-1335 BIT	21935-47	Soil	8/2/117	1335	Cool		X	X		-	- 9	
ARMW- 87/17-10/0 BH2	22937-12	Soil	8/21/17	1610	Cool		X	X			- 98	
ARMW- 32(17-1505 BHZ	2 9 24-26	Soil	8/21/17	1505	Cool		X	X			- 40 - 87	
ARMW- 82117-1550 BHZ	2932-37	Soil	8/21/17	1550	Cool		X	X				
ARMW- 32217-1310 B1+2	3 9 30-35	Soil	8/22/17	13/0	Cool		X	X		11.0025.00		
ARMW-82217-1325 BHZ	3935-40	Soil	8/22/17	1325	Cool	1/	X	X				
ARMW- 82217-1450BH-2	4910-15	Soil	8/22/17	1450	Cool	V	X	X	0		70	
Media : Filter = F Soil = S Wastewate	er = WW Groun	dwater = G	W Drinking V	Vaster = D	W Sludge = SG	Surface W	/ater	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	A Drill Mud	= DM Other	-13	
Relinquished By: (Signature)		Date:	23/17	Time:	Received By: (					of Bottles	Sample Condition	
Relinquished By: (Signature)		Date:		Time:	Received By: (	Signature	)	1977	Tempere	ature: re 3. re	Cette	
Relinquished By: (Signature)		Date:	243	Time:	Received for L	1.1. (**			Date:	2.1	Other Information	

* Sample ID will be the office and sampler-date-military time-sampler initials FARJM-MMDDYY-1200

		Ŷ	uote Numi XTO	ber		Page 2 of 2					ysis	La	Lab Information		
XTC	2		TO Contac mes McDa	iniel		O Contact Pho 505-333-370									
E N E R G Western Divisio	on	M	James Nicker@L1	Email Res _McDaniel@ TEnv.com & c	XTOener	rgy.com nn@ltenv.com							e Abbreviations ton = FAR		
Well Site/Location OH Randel #5		1	API Numbe 0-045-0596	er	T	Test Reason	0	1	ARO			Durango	= DUR		
Collected By		Sample		Ice (Y / N)24-1 RequestedX ndardTwo		Quarterly GW			SO/A			Bakken = Raton = F	TAT		
Company LT Environmental, In Signature	IC.	QA	/QC Reque Standard			24-Hour X Next Day Two Day			(Gro/DRO/MRO)			Piceance Roosevelt La Barge	t = RSV		
	1	Gray Are	as for Lab	Use Only!	Std.5	Three Day Std.5 Bus. Days(by contract) te Needed		8021	8015B (		Sept. 2	Orangevi	Orangeville = OV L931528		
Sample ID	Samp	le Name	Media	Date	Time	Preservative	No. of Conts.	BTEX	TPH 8			-			
FARMW-822/7-1320	BH-24	9 30-35	Soil	8/22/17	1320	Cool	(	X	X	$\vdash$	-	Sau	nple Number		
FARMW- 82217-1530	BH-24	1 9 35-40	Soil	3/24/17	1530	Cool	1	X	X				-14		
ARMW- 92217-1550	BHZY	940-43	Soil	8/22/17	1550	Cool	1	X	X				-15		
ARMW- 82217-1075	BH 20	7950-55	Soil	8122/17	1025	Cool	- V	X	X	121					
ARMW-			Soil			Cool		X	X				-17		
ARMW-			Soil			Cool		X	X			-			
ARMW-			Soil			Cool		X	X						
ARMW-			Soil			Cool		X	X						
ARMW-			Soil	1.1.1.1		Cool		X	X						
ARMW-			Soil			Cool		X	X						
ARMW-		2	Soil			Cool		X	X						
FARMW-			Soil			Cool		x	x			-			
FARMW-	A STATE		Soil	11		Cool		x	x			-			
Aedia : Filter = F Soil = S Wa	stewater =	WW Groun	dwater = GV	W Drinking V	Vaster = D		Surface V	Contraction of the		Air=A	Drill Mud	= DM Other			
Relinquished By: (Signature	e)	£	Date:	123/17	Time:	Received By: (		_				of Bottles	Sample Condition		
Relinquished By: (Signature	2)	-30	Date:			Received By: (	(ignature)	)			Tempero				
Relinquished By: (Signature	2)		Date: T		Time: Received for Lab by: (Signat		nature) Date:			Date:	3>	Other Information			

* Sample ID will be the office and sampler-date-military time-sampler initials FARJM-MMDDYY-1200

ESC LAB	SCIENCES		
Cooler Re	eceipt Form		
Client: XTORNM	SDG#	6931	528
Cooler Received/Opened On: 8/24/17	Temperature: 3.1	2	
Received by : Ian White			
Signature: In Wil			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	1		
COC Signed / Accurate?		1	1000
Bottles arrive intact?		1	
Correct bottles used?		1	(四) (1)
Sufficient volume sent?		1	
If Applicable			
VOA Zero headspace?		1	
Preservation Correct / Checked?			



# ANALYTICAL REPORT

October 10, 2017

# **XTO Energy - San Juan Division**

Sample Delivery Group:

Samples Received:

Project Number:

Description:

OH Randal #5

L940569

10/03/2017

Report To:

James McDaniel 382 County Road 3100 Aztec, NM 87410

Entire Report Reviewed By:

Dapline R Richards

Daphne Richards Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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SDG: L940569

DATE/TIME: 10/10/17 16:26

# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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Ср

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	SAMPLE SU	JININA	ΥY	ON	E LAB. NATIONWI
BH20 75-80 L940569-01 Solid			Collected by D. Burns	Collected date/time 09/28/17 09:20	Received date/time 10/03/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	2
Total Solids by Method 2540 G-2011	WG1028636	1	10/06/17 13:50	10/06/17 14:02	JD
Volatile Organic Compounds (GC) by Method 8015/8021	WG1029054	500	10/03/17 15:38	10/09/17 13:37	JAH
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 12:43	TH
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	5	10/06/17 09:11	10/08/17 19:53	TH
			Collected by	Collected date/time	Received date/time
BH20 80-82 L940569-02 Solid			D. Burns	09/28/17 09:40	10/03/17 08:45
Nethod	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
fotal Solids by Method 2540 G-2011	WG1028558	1	10/06/17 10:46	10/06/17 10:55	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG1029054	500	10/03/17 15:38	10/09/17 14:00	JAH
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 12:57	TH
			Collected by	Collected date/time	Received date/time
BH13 38-40 L940569-03 Solid			D. Burns	09/28/17 12:10	10/03/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	- )
Fotal Solids by Method 2540 G-2011	WG1028636	1	10/06/17 13:50	10/06/17 14:02	JD
/olatile Organic Compounds (GC) by Method 8015/8021	WG1029054	5000	10/03/17 15:38	10/10/17 14:32	LRL
/olatile Organic Compounds (GC) by Method 8013/8021	WG1029054	500	10/03/17 15:38	10/09/17 14:23	JAH
Semi-Volatile Organic Compounds (GC) by Method 8021	WG1028273	1	10/06/17 09:11	10/07/17 13:11	TH
Senii-volatile organic compounds (GC) by Method 8015	WG1028275	I	10/00/17 09.11	10/07/17 13.11	П
			Collected by	Collected date/time	Received date/time
BH13 50-54 L940569-04 Solid			D. Burns	09/28/17 13:45	10/03/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Fotal Solids by Method 2540 G-2011	WG1028642	1	10/06/17 14:59	10/06/17 15:11	JD
/olatile Organic Compounds (GC) by Method 8015/8021	WG1029054	100	10/03/17 15:38	10/09/17 14:45	JAH
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 13:25	TH
com-volatile organic compounds (OC) by incluind on 5	W01020275	I	10/00/17 03:11	10/07/17 13.23	111
			Collected by	Collected date/time	Received date/time
3H25 30-35 L940569-05 Solid			D. Burns	09/28/17 15:30	10/03/17 08:45
/lethod	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1028558	1	10/06/17 10:46	10/06/17 10:55	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG1029054	1	10/03/17 15:38	10/09/17 12:30	JAH
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 13:39	TH
			Collected by	Collected date/time	Received date/time
			D. Burns	09/29/17 11:00	10/03/17 08:45
BH25 45-50 1940569-06 Solid					
	Batch	Dilution	Preparation	Analysis	Analyst
	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Method	Batch WG1028558	Dilution 1	·		Analyst KDW
BH25 45-50 L940569-06 Solid Method Total Solids by Method 2540 G-2011 Volatile Organic Compounds (GC) by Method 8015/8021			date/time	date/time	•

PROJECT:

SDG: L940569 DATE/TIME: 10/10/17 16:26

# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

BH26 20-25 L940569-07 Solid			Collected by D. Burns	Collected date/time 09/29/17 12:00	Received date/time 10/03/17 08:45	1
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	2
Total Solids by Method 2540 G-2011	WG1028647	1	10/06/17 14:19	10/06/17 14:36	JD	
Volatile Organic Compounds (GC) by Method 8015/8021	WG1029054	1	10/03/17 15:38	10/09/17 13:15	JAH	
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 14:07	TH	



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Ср

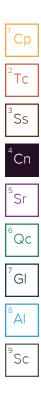
# CASE NARRATIVE

*

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Japhne R Richards

Daphne Richards Technical Service Representative



#### SAMPLE RESULTS - 01 L940569

#### Total Solids by Method 2540 G-2011

		Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte		%			date / time		2
Total Sc	lids	91.7		1	10/06/2017 14:02	WG1028636	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

Volatile Organic Comp	ounds (GC) by Method 8015/8021							Ss
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch		
Analyte	mg/kg		mg/kg		date / time		4	¹ Cn
Benzene	12.0		0.273	500	10/09/2017 13:37	WG1029054		CII
Toluene	114		2.73	500	10/09/2017 13:37	WG1029054	5	5
Ethylbenzene	21.6		0.273	500	10/09/2017 13:37	WG1029054	Ŭ	Sr
Total Xylene	171		0.818	500	10/09/2017 13:37	WG1029054		
TPH (GC/FID) Low Fraction	4900		54.5	500	10/09/2017 13:37	WG1029054	6	[°] Qc
(S) a,a,a-Trifluorotoluene(FID)	85.9		77.0-120		10/09/2017 13:37	WG1029054		QC
(S) a,a,a-Trifluorotoluene(PID)	90.3		75.0-128		10/09/2017 13:37	WG1029054	7	GI

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	ٌAI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	435		21.8	5	10/08/2017 19:53	WG1028273	°Sc
C28-C40 Oil Range	21.5		4.36	1	10/07/2017 12:43	WG1028273	50
(S) o-Terphenyl	107		18.0-148		10/08/2017 19:53	WG1028273	
(S) o-Terphenyl	69.4		18.0-148		10/07/2017 12:43	WG1028273	

#### SAMPLE RESULTS - 02 L940569

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	90.9		1	10/06/2017 10:55	WG1028558	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Benzene	2.11		0.275	500	10/09/2017 14:00	WG1029054
Toluene	63.8		2.75	500	10/09/2017 14:00	WG1029054
Ethylbenzene	13.4		0.275	500	10/09/2017 14:00	WG1029054
Total Xylene	121		0.825	500	10/09/2017 14:00	WG1029054
TPH (GC/FID) Low Fraction	2710		55.0	500	10/09/2017 14:00	WG1029054
(S) a,a,a-Trifluorotoluene(FID)	85.9		77.0-120		10/09/2017 14:00	WG1029054
(S) a,a,a-Trifluorotoluene(PID)	87.2		75.0-128		10/09/2017 14:00	WG1029054

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	340		4.40	1	10/07/2017 12:57	WG1028273	
C28-C40 Oil Range	24.2		4.40	1	10/07/2017 12:57	WG1028273	
(S) o-Terphenyl	65.4		18.0-148		10/07/2017 12:57	WG1028273	

#### SAMPLE RESULTS - 03 L940569

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	C	.p
Analyte	%			date / time		2	_
Total Solids	92.7		1	10/06/2017 14:02	WG1028636	T T	С

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	73.4		0.270	500	10/09/2017 14:23	WG1029054	
Foluene	378		27.0	5000	10/10/2017 14:32	WG1029054	
Ethylbenzene	43.7		0.270	500	10/09/2017 14:23	WG1029054	
Fotal Xylene	321		0.809	500	10/09/2017 14:23	WG1029054	
FPH (GC/FID) Low Fraction	8090		539	5000	10/10/2017 14:32	WG1029054	
(S) a,a,a-Trifluorotoluene(FID)	81.3		77.0-120		10/10/2017 14:32	WG1029054	
(S) a,a,a-Trifluorotoluene(FID)	89.6		77.0-120		10/09/2017 14:23	WG1029054	
(S) a,a,a-Trifluorotoluene(PID)	105		75.0-128		10/09/2017 14:23	WG1029054	
(S) a,a,a-Trifluorotoluene(PID)	103		75.0-128		10/10/2017 14:32	WG1029054	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	9
Analyte	mg/kg		mg/kg		date / time		50
C10-C28 Diesel Range	295		4.31	1	10/07/2017 13:11	WG1028273	
C28-C40 Oil Range	14.4		4.31	1	10/07/2017 13:11	WG1028273	
(S) o-Terphenyl	71.5		18.0-148		10/07/2017 13:11	WG1028273	

#### SAMPLE RESULTS - 04 L940569

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	 Ср
Analyte	%			date / time		2
Total Solids	81.1		1	10/06/2017 15:11	WG1028642	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Benzene	0.592		0.0616	100	10/09/2017 14:45	WG1029054
Toluene	14.8		0.616	100	10/09/2017 14:45	WG1029054
Ethylbenzene	4.07		0.0616	100	10/09/2017 14:45	WG1029054
Total Xylene	38.3	<u>J6</u>	0.185	100	10/09/2017 14:45	WG1029054
TPH (GC/FID) Low Fraction	908		12.3	100	10/09/2017 14:45	WG1029054
(S) a,a,a-Trifluorotoluene(FID)	86.8		77.0-120		10/09/2017 14:45	WG1029054
(S) a,a,a-Trifluorotoluene(PID)	87.0		75.0-128		10/09/2017 14:45	WG1029054

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	257		4.93	1	10/07/2017 13:25	WG1028273	
C28-C40 Oil Range	18.8		4.93	1	10/07/2017 13:25	WG1028273	
(S) o-Terphenyl	63.8		18.0-148		10/07/2017 13:25	WG1028273	

# BH25 30-35

# Collected date/time: 09/28/17 15:30

#### SAMPLE RESULTS - 05 L940569

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	80.5		1	10/06/2017 10:55	WG1028558	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	l
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.00956		0.000621	1	10/09/2017 12:30	WG1029054	
Toluene	0.0413		0.00621	1	10/09/2017 12:30	WG1029054	
Ethylbenzene	0.00304		0.000621	1	10/09/2017 12:30	WG1029054	
Total Xylene	0.0534		0.00186	1	10/09/2017 12:30	WG1029054	
TPH (GC/FID) Low Fraction	0.399		0.124	1	10/09/2017 12:30	WG1029054	
(S) a,a,a-Trifluorotoluene(FID)	97.0		77.0-120		10/09/2017 12:30	WG1029054	
(S) a,a,a-Trifluorotoluene(PID)	88.6		75.0-128		10/09/2017 12:30	WG1029054	
Semi-Volatile Organic	Compounds	(GC) by Me	ethod 8015				
	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	AI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	5.00		4.97	1	10/07/2017 13:39	WG1028273	⁹ Sc
C28-C40 Oil Range	ND		4.97	1	10/07/2017 13:39	WG1028273	50
(S) o-Terphenyl	95.5		18.0-148		10/07/2017 13:39	WG1028273	

#### SAMPLE RESULTS - 06 L940569

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	-   Cp
Analyte	%			date / time		2
Total Solids	94.7		1	10/06/2017 10:55	WG1028558	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
nalyte	mg/kg		mg/kg		date / time		
enzene	0.000770		0.000528	1	10/09/2017 12:52	WG1029054	
oluene	ND		0.00528	1	10/09/2017 12:52	WG1029054	
thylbenzene	ND		0.000528	1	10/09/2017 12:52	WG1029054	
otal Xylene	0.00202	B	0.00158	1	10/09/2017 12:52	WG1029054	
PH (GC/FID) Low Fraction	ND		0.106	1	10/09/2017 12:52	WG1029054	
(S) a,a,a-Trifluorotoluene(FID)	97.1		77.0-120		10/09/2017 12:52	WG1029054	
(S) a,a,a-Trifluorotoluene(PID)	87.8		75.0-128		10/09/2017 12:52	WG1029054	

#### Result (dry) Qualifier RDL (dry) Dilution Analysis Batch AI date / time Analyte mg/kg mg/kg C10-C28 Diesel Range ND 4.22 1 10/07/2017 13:53 WG1028273 Sc ND WG1028273 C28-C40 Oil Range 4.22 10/07/2017 13:53 1 (S) o-Terphenyl 98.6 18.0-148 10/07/2017 13:53 WG1028273

#### BH26 20-25 Collected date/time: 09/29/17 12:00

#### SAMPLE RESULTS - 07 L940569

#### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Cp
Analyte	%			date / time		2
Total Solids	80.4		1	10/06/2017 14:36	WG1028647	Tc

#### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	
Analyte	mg/kg		mg/kg		date / time		
Benzene	0.0103		0.000622	1	10/09/2017 13:15	WG1029054	
oluene	0.0146		0.00622	1	10/09/2017 13:15	WG1029054	
Ethylbenzene	ND		0.000622	1	10/09/2017 13:15	WG1029054	
otal Xylene	0.00390	B	0.00187	1	10/09/2017 13:15	WG1029054	
PH (GC/FID) Low Fraction	ND		0.124	1	10/09/2017 13:15	WG1029054	
(S) a,a,a-Trifluorotoluene(FID)	96.7		77.0-120		10/09/2017 13:15	WG1029054	
(S) a,a,a-Trifluorotoluene(PID)	88.0		75.0-128		10/09/2017 13:15	WG1029054	

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch	AI
Analyte	mg/kg		mg/kg		date / time		
C10-C28 Diesel Range	ND		4.98	1	10/07/2017 14:07	WG1028273	9 SC
C28-C40 Oil Range	ND		4.98	1	10/07/2017 14:07	WG1028273	50
(S) o-Terphenyl	87.8		18.0-148		10/07/2017 14:07	WG1028273	

Total Solids by Method 2540 G-2011

# QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

					1 C
0/06/17 10:55					
MB Result	MB Qualifier	MB MDL	/B RDL		2
%		%	6		T
0.0005					
					³ S
	0/06/17 10:55 MB Result %	O/O6/17 10:55 MB Result <u>MB Qualifier</u> %	O/O6/17 10:55 MB Result <u>MB Qualifier</u> MB MDL N % % 9	O/O6/17 10:55 MB Result MB Qualifier MB MDL MB RDL % % %	D/O6/17 10:55       MB Result     MB Qualifier     MB RDL       %     %

#### L940569-02 Original Sample (OS) • Duplicate (DUP)

(OS) L940569-02 10/06/1	17 10:55 • (DUP)	R3255530-3	10/06/17 1	0:55		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	90.9	91.3	1	0		5

#### Laboratory Control Sample (LCS)

(LCS) R3255530-2 10/	/06/17 10:55				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85-115	

SDG: L940569 DATE/TIME: 10/10/17 16:26

PAGE: 13 of 23

Total Solids by Method 2540 G-2011

# QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3255781-1 10/0	6/17 14:02			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.0002			

#### L940775-01 Original Sample (OS) • Duplicate (DUP)

(OS) L940775-01 10/06/17	7 14:02 • (DUP) F	23255781-3 1	0/06/17 14:	02		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	84.6	84.7	1	0		5

#### Laboratory Control Sample (LCS)

(LCS) R3255781-2 10/	06/17 14:02				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85-115	



DATE/TIME: 10/10/17 16:26

Total Solids by Method 2540 G-2011

# QUALITY CONTROL SUMMARY

ONE LAB. NATIONWIDE.

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#### Method Blank (MB)

	,			
(MB) R3255797-1 10/0	6/17 15:11			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0			

#### L940814-02 Original Sample (OS) • Duplicate (DUP)

(OS) L940814-02 10/06/17 15:11 • (DUP) R3255797-3 10/06/17 15:11

(,		Original Result			DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%	%		%		%
Total Solids	83.2	83.2	82.8	1	0		5

#### Laboratory Control Sample (LCS)

(LCS) R3255797-2 1	0/06/17 15:11				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85-115	



DATE/TIME: 10/10/17 16:26

PAGE: 15 of 23

Total Solids by Method 2540 G-2011

# QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3255784-1 10/0	6/17 14:36			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.0006			

#### L940569-07 Original Sample (OS) • Duplicate (DUP)

(OS) L940569-07 10/06/1	17 14:36 • (DUP)	R3255784-3	10/06/17 14	4:36		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	80.4	79.8	1	1		5

#### Laboratory Control Sample (LCS)

(LCS) R3255784-2 10/	06/17 14:36				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85-115	



DATE/TIME: 10/10/17 16:26

Volatile Organic Compounds (GC) by Method 8015/8021

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#### Method Blank (MB)

(MB) R3256047-5 10/09	/17 11:45				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/kg		mg/kg	mg/kg	
Benzene	U		0.000120	0.000500	
Toluene	0.000419	J	0.000150	0.00500	
Ethylbenzene	U		0.000110	0.000500	
Total Xylene	U		0.000460	0.00150	
TPH (GC/FID) Low Fraction	U		0.0217	0.100	
(S) a,a,a-Trifluorotoluene(FID)	99.0			77.0-120	
(S) a,a,a-Trifluorotoluene(PID)	91.3			75.0-128	

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3256047-1 10/09/1	17 09:53 • (LCSI	D) R3256047-2	2 10/09/17 10:16	6						
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Benzene	0.0500	0.0546	0.0569	109	114	71.0-121			4.00	20
Toluene	0.0500	0.0535	0.0554	107	111	72.0-120			3.45	20
Ethylbenzene	0.0500	0.0546	0.0569	109	114	76.0-121			4.22	20
Total Xylene	0.150	0.168	0.175	112	117	75.0-124			4.20	20
(S) a,a,a-Trifluorotoluene(FID)				101	98.0	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				102	98.3	75.0-128				

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3256047-3 10/09	9/17 10:38 • (LCSI	D) R3256047·	-4 10/09/17 11:0	0						
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
TPH (GC/FID) Low Fraction	5.50	5.51	5.52	100	100	70.0-136			0.250	20
(S) a,a,a-Trifluorotoluene(FID)				101	102	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				99.4	98.9	75.0-128				

SDG: L940569 DATE/TIME: 10/10/17 16:26

#### Volatile Organic Compounds (GC) by Method 8015/8021

# QUALITY CONTROL SUMMARY

### L940569-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

#### (OS) L940569-04 10/09/17 14:45 • (MS) R3256047-6 10/09/17 19:56 • (MSD) R3256047-7 10/09/17 20:18

	. ,		,	'								
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Benzene	0.0616	0.592	8.96	9.10	136	138	100	10.0-146			1.49	29
Toluene	0.0616	14.8	18.8	18.8	66.1	65.1	100	10.0-143			0.320	30
Ethylbenzene	0.0616	4.07	9.90	9.74	94.5	92.0	100	10.0-147			1.59	31
Total Xylene	0.185	38.3	48.8	49.4	57.0	60.3	100	10.0-149	<u>J6</u>	<u>J6</u>	1.25	30
(S) a,a,a-Trifluorotoluene(FID)					87.8	88.1		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					97.6	99.4		75.0-128				

### L940569-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L940569-04 10/09/1	7 14:45 • (MS) R	3256047-8 10	/09/17 20:40 •	(MSD) R32560	047-9 10/09/17	21:02						
	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPH (GC/FID) Low Fraction	6.78	908	1530	1470	91.4	83.0	100	10.0-147	E	E	3.76	30
(S) a,a,a-Trifluorotoluene(FID)					96.9	97.3		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					107	108		75.0-128				

DATE/TIME: 10/10/17 16:26

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Semi-Volatile Organic Compounds (GC) by Method 8015

#### QUALITY CONTROL SUMMARY L940569-01,02,03,04,05,06,07

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#### Method Blank (MB)

(MB) R3255555-1 10/06	6/17 22:27			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	88.9			18.0-148

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3255555-2 10/0	06/17 22:41 • (LCSI	D) R3255555	-3 10/06/17 22:	55							
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits	
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%	
C10-C28 Diesel Range	60.0	35.3	32.7	58.9	54.6	50.0-150			7.61	20	
(S) o-Terphenyl				76.5	71.1	18.0-148					

#### L940399-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

L940399-01 Origi	nai Sampie (	05) • Matri	x Spike (i	vis) • Matrix	Spike DL	iplicate (IVIS	D)						β
(OS) L940399-01 10/07/	17 06:32 • (MS) R	3255555-4 10	/07/17 06:47	• (MSD) R3255	555-5 10/07/	17 07:00							<i>.</i> .
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	9
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%	Sc
C10-C28 Diesel Range	12.0	ND	48.9	55.9	48.7	60.4	5	50.0-150	<u>J6</u>		13.5	20	
(S) o-Terphenyl					8.00	79.5		18.0-148					

SDG: L940569

DATE/TIME: 10/10/17 16:26

# GLOSSARY OF TERMS

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#### Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

#### Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the resu reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
В	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

## ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.** * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

### State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey-NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio-VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
lowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee 14	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

### Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{r/a} Accreditation not applicable

### **Our Locations**

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



ACCOUNT:
XTO Energy - San Juan Division

PROJECT:

SDG: L940569 DATE/TIME: 10/10/17 16:26

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//		Qu	ote Numbe	r i		Page _1_ of _1_		Т				1	
XTC			O Contact: les McDani	el	(	Contact Phon 505) 419-0915			8015			-	
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DUE			Media	Date	Time	Preservative	No. of Conts.	BTEX	HdT				le Number
Sample ID	Sampl	e Name	S	9/28/2017	9:20	NA	2	X	X			940	269-01
3H20 @ 75-80'			S	9/28/2017	9:40	NA	2	X	X	1		Contraction of the local division of the loc	a
3H20 @ 80-82'			S	9/28/2017	12:10	NA	2	X	X			10000000	57
BH13 @ 38-40'	-		S	9/28/2017	13:45	NA	2	X	X			1999	24
BH13 @ 50-54'	100		S	9/28/2017	15:30	NA	2	X	X			ward and	05
BH25 @ 30-35'	170		s	9/29/2017	11:00	NA	2	X	X			The second second	a
BH25 @ 45-50'	-		S	9/29/2017	10.00	NA	2	X	X	20	_	There are	57
BH26 @ 20-25'	-			JILDILOTT	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-								and the states
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Media : Filter = F Soil = S Relinquished By: (Signat		- WW Gro	Date:	2-17	Time:	Received by	: (Signatu	re)	/	3	Numbe	er of Bottles	Sample Condition
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* Sample ID will be the office and sampler-date-military time-sampler initials FARJM-MMDDYY-1200

	LAB SCIENCES er Receipt Form		
Client: XTolyn	SDG#	9405	25
Cooler Received/Opened On: 10/3 /17	Temperature:	1.3	
Received by : Jennifer Royal			
Signature: finite Kond			
1		A STATE	
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	16 P 12	/	
COC Signed / Accurate?	「「御聖」と思えると言語でなって	/	344 22
Bottles arrive intact?		/	
Correct bottles used?		1	14-15-1
Sufficient volume sent?	The second second second second second second second second second second second second second second second s	/	1.00
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VOA Zero headspace?	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		
Preservation Correct / Checked?			



# ANALYTICAL REPORT

October 10, 2017

### **XTO Energy - San Juan Division**

Sample Delivery Group:

Samples Received:

Project Number:

Description:

OH Randal #5

L940568

10/03/2017

Report To:

James McDaniel 382 County Road 3100 Aztec, NM 87410

Entire Report Reviewed By:

Daptime R Richards

Daphne Richards Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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DE.	₩
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	³ Ss
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SDG: L940568 DATE/TIME: 10/10/17 17:49

## SAMPLE SUMMARY

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	SAMI LE SC		<b>X</b> I		
BH27 35-40 L940568-01 Solid			Collected by D. Burns	Collected date/time 09/30/17 11:00	Received date/time 10/03/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1027125	1	10/03/17 11:00	10/03/17 11:36	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG1027344	25	10/03/17 10:22	10/03/17 17:26	BMB
			Collected by	Collected date/time	Received date/time
BH 27 40-45 L940568-02 Solid			D. Burns	09/30/17 11:30	10/03/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1027125	1	10/03/17 11:00	10/03/17 11:36	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG1027344	500	10/03/17 10:22	10/03/17 17:04	BMB
			Collected by	Collected date/time	Received date/time
BH27 45-50 L940568-03 Solid			D. Burns	09/30/17 12:00	10/03/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1027125	1	10/03/17 11:00	10/03/17 11:36	KDW
Volatile Organic Compounds (GC) by Method 8015/8021	WG1027344	1000	10/03/17 10:22	10/03/17 17:49	BMB
			Collected by	Collected date/time	Received date/time
BH27 35-40 L940568-04 Solid			D. Burns	09/30/17 11:00	10/03/17 08:45
Method	Batch	Dilution	Preparation	Analysis	Analyst
			date/time	date/time	
Total Solids by Method 2540 G-2011	WG1027125	1	10/03/17 11:00	10/03/17 11:36	KDW
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 11:18	TH
			Collected by	Collected date/time	Received date/time
BH 27 40-45 L940568-05 Solid			D. Burns	09/30/17 11:30	10/03/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1027125	1	10/03/17 11:00	10/03/17 11:36	KDW
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 12:14	TH
			Collected by	Collected date/time	Received date/time
BH27 45-50 L940568-06 Solid			D. Burns	09/30/17 12:00	10/03/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1027125	1	10/03/17 11:00	10/03/17 11:36	KDW
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1028273	1	10/06/17 09:11	10/07/17 12:29	TH
Semi-Volatile Organic Compounds (GC) by Method 8015		5	10/06/17 09:11		TH

SDG: L940568 DATE/TIME: 10/10/17 17:49

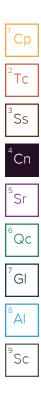
### CASE NARRATIVE

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Japhne R Richards

Daphne Richards Technical Service Representative



### BH27 35-40 Collected date/time: 09/30/17 11:00

### SAMPLE RESULTS - 01 L940568

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### Total Solids by Method 2540 G-2011

						 1 Cn	
	Result	Qualifier	Dilution	Analysis	Batch	Cp	
Analyte	%			date / time		2	Ĺ
Total Solids	75.7		1	10/03/2017 11:36	WG1027125	Tc	
							1

### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Benzene	0.0442	B	0.0165	25	10/03/2017 17:26	WG1027344
Toluene	0.863		0.165	25	10/03/2017 17:26	WG1027344
Ethylbenzene	1.19		0.0165	25	10/03/2017 17:26	WG1027344
Total Xylene	9.66		0.0496	25	10/03/2017 17:26	WG1027344
TPH (GC/FID) Low Fraction	207		3.30	25	10/03/2017 17:26	WG1027344
(S) a,a,a-Trifluorotoluene(FID)	83.5		77.0-120		10/03/2017 17:26	WG1027344
(S) a,a,a-Trifluorotoluene(PID)	94.6		75.0-128		10/03/2017 17:26	WG1027344

### BH 27 40-45 Collected date/time: 09/30/17 11:30

### SAMPLE RESULTS - 02 L940568

### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	ГСр
Analyte	%			date / time		2
Total Solids	94.9		1	10/03/2017 11:36	WG1027125	Tc

### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Benzene	ND		0.263	500	10/03/2017 17:04	WG1027344
Toluene	5.91		2.63	500	10/03/2017 17:04	WG1027344
Ethylbenzene	3.98		0.263	500	10/03/2017 17:04	WG1027344
Total Xylene	35.4		0.790	500	10/03/2017 17:04	WG1027344
TPH (GC/FID) Low Fraction	621		52.7	500	10/03/2017 17:04	WG1027344
(S) a,a,a-Trifluorotoluene(FID)	86.1		77.0-120		10/03/2017 17:04	WG1027344
(S) a,a,a-Trifluorotoluene(PID)	98.3		75.0-128		10/03/2017 17:04	WG1027344

### BH27 45-50 Collected date/time: 09/30/17 12:00

### SAMPLE RESULTS - 03 L940568

### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch	Ср
Analyte	%			date / time		2
Total Solids	93.8		1	10/03/2017 11:36	WG1027125	Tc

### Volatile Organic Compounds (GC) by Method 8015/8021

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
Benzene	ND		0.533	1000	10/03/2017 17:49	WG1027344
Toluene	18.9		5.33	1000	10/03/2017 17:49	WG1027344
Ethylbenzene	7.51		0.533	1000	10/03/2017 17:49	WG1027344
Total Xylene	68.1		1.60	1000	10/03/2017 17:49	WG1027344
TPH (GC/FID) Low Fraction	1540		107	1000	10/03/2017 17:49	WG1027344
(S) a,a,a-Trifluorotoluene(FID)	85.5		77.0-120		10/03/2017 17:49	WG1027344
(S) a,a,a-Trifluorotoluene(PID)	98.8		75.0-128		10/03/2017 17:49	WG1027344

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### BH27 35-40 Collected date/time: 09/30/17 11:00

### SAMPLE RESULTS - 04 L940568

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### Total Solids by Method 2540 G-2011

		-				 1 Cm	L
	Result	Qualifier	Dilution	Analysis	Batch	Cp	l
Analyte	%			date / time		2	i
Total Solids	75.6		1	10/03/2017 11:36	WG1027125	Tc	

### Semi-Volatile Organic Compounds (GC) by Method 8015

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		5.29	1	10/07/2017 11:18	WG1028273
C28-C40 Oil Range	ND		5.29	1	10/07/2017 11:18	<u>WG1028273</u>
(S) o-Terphenyl	87.9		18.0-148		10/07/2017 11:18	WG1028273

### BH 27 40-45 Collected date/time: 09/30/17 11:30

### SAMPLE RESULTS - 05 L940568

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### Total Solids by Method 2540 G-2011

					l'Cn	L
	Result	Qualifier Dilution	Analysis	Batch	Cp	l
Analyte	%		date / time		2	i
Total Solids	94.6	1	10/03/2017 11:36	WG1027125	Tc	

### Semi-Volatile Organic Compounds (GC) by Method 8015

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
nalyte	mg/kg		mg/kg		date / time	
0-C28 Diesel Range	303		4.23	1	10/07/2017 12:14	WG1028273
28-C40 Oil Range	26.7		4.23	1	10/07/2017 12:14	WG1028273
(S) o-Terphenyl	71.5		18.0-148		10/07/2017 12:14	WG1028273

## BH27 45-50

## Collected date/time: 09/30/17 12:00

### SAMPLE RESULTS - 06 L940568

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### Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch		-p
Analyte	%			date / time		2	
Total Solids	93.8		1	10/03/2017 11:36	WG1027125	۲	Гс

### Semi-Volatile Organic Compounds (GC) by Method 8015

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	510		21.3	5	10/08/2017 19:39	WG1028273
C28-C40 Oil Range	33.2		4.26	1	10/07/2017 12:29	WG1028273
(S) o-Terphenyl	65.2		18.0-148		10/07/2017 12:29	WG1028273
(S) o-Terphenyl	90.5		18.0-148		10/08/2017 19:39	WG1028273

### WG1027125

Total Solids by Method 2540 G-2011

## QUALITY CONTROL SUMMARY

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### Method Blank (MB)

(MB) R3254523-1 10/0	03/17 11:36			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.0012			

### L940568-01 Original Sample (OS) • Duplicate (DUP)

(OS) L940568-01 10/0	)3/17 11:36 • (DUP)	R3254523-3 1	0/03/17 11:	36		
	Original Resu	ult DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	75.7	75.0	1	1		5

### Laboratory Control Sample (LCS)

(LCS) R3254523-2 10	)/03/17 11:36				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85-115	

SDG: L940568 DATE/TIME: 10/10/17 17:49 PAGE: 11 of 18 Volatile Organic Compounds (GC) by Method 8015/8021

## QUALITY CONTROL SUMMARY

### Method Blank (MB)

(MB) R3254454-3 10/03/	17 15:35			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Benzene	0.000213	J	0.000120	0.000500
Toluene	0.000340	J	0.000150	0.00500
Ethylbenzene	0.000124	J	0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	0.0282	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	89.5			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	97.8			75.0-128

### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3254454-1 10/03/	.CS) R3254454-1 10/03/17 14:28 • (LCSD) R3254454-2 10/03/17 14:50											
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits		
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%		
TPH (GC/FID) Low Fraction	5.50	4.92	4.84	89.5	87.9	70.0-136			1.80	20		
(S) a,a,a-Trifluorotoluene(FID)				106	105	77.0-120						
(S) a,a,a-Trifluorotoluene(PID)				113	112	75.0-128						

### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3254454-4 10/03	/17 16:19 • (LCSD	) R3254454-5	10/03/17 16:42							
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Benzene	0.0500	0.0434	0.0438	86.9	87.6	71.0-121			0.830	20
Toluene	0.0500	0.0469	0.0471	93.8	94.2	72.0-120			0.440	20
Ethylbenzene	0.0500	0.0471	0.0480	94.3	96.0	76.0-121			1.78	20
Total Xylene	0.150	0.141	0.140	93.9	93.0	75.0-124			1.00	20
(S) a,a,a-Trifluorotoluene(FID)				86.4	89.3	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				92.1	96.2	75.0-128				

SDG: L940568 DATE/TIME: 10/10/17 17:49 Ss

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QUALITY CONTROL SUMMARY

### L940163-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L940163-01 10/03/17	18:19 • (MS) R32	254454-6 10/0	)3/17 22:49 • (N	1SD) R3254454	1-7 10/03/17 23	3:12						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Benzene	0.0500	ND	22.4	22.3	89.4	89.0	500	10.0-146			0.460	29
Toluene	0.0500	ND	23.9	24.0	94.2	94.3	500	10.0-143			0.140	30
Ethylbenzene	0.0500	ND	27.2	27.0	109	108	500	10.0-147			0.650	31
Total Xylene	0.150	15.0	82.5	81.5	90.0	88.7	500	10.0-149			1.22	30
(S) a,a,a-Trifluorotoluene(FID)					90.2	90.4		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					96.6	96.9		75.0-128				

### L940163-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L940163-01 10/03/17	18:19 • (MS) R32	254454-8 10/0	3/17 23:34 • (	MSD) R325445	4-9 10/03/17 2	3:56						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPH (GC/FID) Low Fraction	5.50	958	3300	3300	85.3	85.3	500	10.0-147			0.0200	30
(S) a,a,a-Trifluorotoluene(FID)					101	101		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					108	108		75.0-128				

DATE/TIME: 10/10/17 17:49

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Semi-Volatile Organic Compounds (GC) by Method 8015

## QUALITY CONTROL SUMMARY

### Method Blank (MB)

(MB) R3255555-1 10/06	6/17 22:27			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	88.9			18.0-148

### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3255555-2 10/0	06/17 22:41 • (LCS	D) R3255555	-3 10/06/17 22:	55							
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits	
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%	
C10-C28 Diesel Range	60.0	35.3	32.7	58.9	54.6	50.0-150			7.61	20	
(S) o-Terphenyl				76.5	71.1	18.0-148					

### L940399-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L940399-01 10/07/	17 06:32 • (MS) F	3255555-4 10	/07/17 06:47	• (MSD) R32555	555-5 10/07/1	7 07:00							
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	9
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%	 Sc
C10-C28 Diesel Range	12.0	ND	48.9	55.9	48.7	60.4	5	50.0-150	<u>J6</u>		13.5	20	
(S) o-Terphenyl					8.00	79.5		18.0-148					

DATE/TIME: 10/10/17 17:49

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## GLOSSARY OF TERMS

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### Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

### Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the resu reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
В	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

SDG: L940568

## ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.** * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

### State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey-NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio-VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
lowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee 14	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

### Third Party & Federal Accreditations

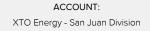
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{r/a} Accreditation not applicable

### **Our Locations**

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.





SDG: L940568

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	0	uote Numbe	r		Page _1_ of _1_		_	-	Analysi	5	Lab	Information
XTO		TO Contact: mes McDan		хто	Contact Phon (505) 419-091	e #:		8015				
ENERC Western Divisio	GY is	mes mcdanie	Email Resu	com; aage	er@ltenv.com; ltenv.com			Method 8015			Farmingto	
Well Site/Location		API Number			Test Reason		1.1				Durango = Bakken =	BAK
OH Randel #5 Collected By D. Burns	Sample	es on Ice Yes	(Y / N)		Turnaround	5)	8021	/ORO			Raton = R Piceance = Roosevelt	PC
Company LT Environmental, I		/QC Reques	ted	Next Day Two Day Three Day			Method 8021	(GRO/DRO/ORO)			La Barge Orangevil	= LB
ignature	Gray Ar	eas for Lab	Use Only!		Bus. Days(by	contract)	1	(GRC		1		1 Shake
	Sample Name	Media	Date	Time	Preservative	No. of Conts.	BTEX	TPH			A REAL PROPERTY AND A REAL PROPERTY.	ple Number
Sample ID	sample Nume	S	9/30/2017	11:00	NA	1	X	X			940	563.01
3H27 @ 35-40'		S	9/30/2017	11:30	NA	1	X	X			1000000000	61
BH27 @ 40-45' BH27 @ 45-50'		S	9/30/2017	12:00	NA	1	X	X		100		07
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											77.39	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -
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	Wednesday - WW Gr	oundwater = (	W Drinking	Waster =	DW Sludge = St	G Surface	Wate	r = SW	Air =	A Drill	Mud = DM Othe	the second second second second second second second second second second second second second second second s
Media : Filter = F Soil = S Relinquished By: (Signal	Miles (Critical)	In .	-2-17	Time: 0800	Received By:			1		Num	iber of Bottles 3	Sample Condition
Relinquished By: (Signature)			1-2-17	Time: /600	Received By	: (Signatu	re)			Tem	iperature:	Other Information
Relinquished By: (Signa	ture)	Date:		Time:	Received for		Signe	ture)	l	Dat 10.3	# 8:45	COCSI
Comments Same	Day		1		0 0			67	77 0(	200	1380	20

* Sample ID will be the office and sampler-date-military time-sampler initials FARM-MINIDDYY-120

ESC LAB	3 SCIENCES		
Cooler R	eceipt Form		
Client: XTOLNA	SDG#	9405	28
Cooler Received/Opened On: 10/ 7 /17	Temperature:	1.3	St. 1.0
Received by : Jennifer Royal			
Signature: femily hor	d		
1			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			1000
COC Signed / Accurate?			20000000
Bottles arrive intact?			Statist Bar
Correct bottles used?			
Sufficient volume sent?			-
If Applicable			
VOA Zero headspace?	5.0%		-
Preservation Correct / Checked?	the Bart of the Control of The Walter State		-



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 03, 2019

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

OrderNo.: 1812913

RE: OH Randel 5

Dear Carla Cordova:

Hall Environmental Analysis Laboratory received 4 sample(s) on 12/15/2018 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued December 20, 2018.

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. 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. All samples are reported as received unless otherwise indicated.

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

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** OH Randel 5

1812913-001

Project:

Lab ID:

Client Sample ID: BH-33 30-35' Collection Date: 12/13/2018 1:30:00 PM Received Date: 12/15/2018 4:00:00 PM

Analyses	Result	PQL (	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS					Analyst: Irm
Diesel Range Organics (DRO)	140	9.2		mg/Kg	1	12/20/2018 6:47:50 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	12/20/2018 6:47:50 AM
Surr: DNOP	98.1	50.6-138		%Rec	1	12/20/2018 6:47:50 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	1100	240		mg/Kg	50	12/18/2018 9:42:34 AM
Surr: BFB	170	73.8-119	S	%Rec	50	12/18/2018 9:42:34 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.2		mg/Kg	50	12/18/2018 9:42:34 AM
Toluene	31	2.4		mg/Kg	50	12/18/2018 9:42:34 AM
Ethylbenzene	6.5	2.4		mg/Kg	50	12/18/2018 9:42:34 AM
Xylenes, Total	71	4.7		mg/Kg	50	12/18/2018 9:42:34 AM
Surr: 4-Bromofluorobenzene	128	80-120	S	%Rec	50	12/18/2018 9:42:34 AM

Matrix: SOIL

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 8
	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

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

OH Randel 5

Client Sample ID: BH-33 75-80' Collection Date: 12/14/2018 9:30:00 AM

Lab ID: 1812913-002

**Project:** 

Matrix: MEOH (SOIL) Received Date: 12/15/2018 4:00:00 PM

Analyses	Result	PQL (	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS					Analyst: Irm
Diesel Range Organics (DRO)	180	10		mg/Kg	1	12/17/2018 10:37:36 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/17/2018 10:37:36 AM
Surr: DNOP	100	50.6-138		%Rec	1	12/17/2018 10:37:36 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	6900	270		mg/Kg	50	12/17/2018 9:49:36 AM
Surr: BFB	239	73.8-119	S	%Rec	50	12/17/2018 9:49:36 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	26	1.4		mg/Kg	50	12/17/2018 9:49:36 AM
Toluene	250	2.7		mg/Kg	50	12/17/2018 9:49:36 AM
Ethylbenzene	26	2.7		mg/Kg	50	12/17/2018 9:49:36 AM
Xylenes, Total	280	5.4		mg/Kg	50	12/17/2018 9:49:36 AM
Surr: 4-Bromofluorobenzene	113	80-120		%Rec	50	12/17/2018 9:49:36 AM

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 8
	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

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** OH Randel 5

Project:

Client Sample ID: BH-32 40-45' Collection Date: 12/14/2018 11:00:00 AM Received Date: 12/15/2018 4:00:00 PM

Lab ID: 1812913-003	Matrix: SOIL	Rece	ived Date:	12/15/	2018 4:00:00 PM
Analyses	Result	PQL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	12/20/2018 7:53:59 AM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	12/20/2018 7:53:59 AM
Surr: DNOP	96.8	50.6-138	%Rec	1	12/20/2018 7:53:59 AM
EPA METHOD 8015D: GASOLINE RAN	GE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	12/19/2018 10:29:50 AM
Surr: BFB	96.8	73.8-119	%Rec	1	12/19/2018 10:29:50 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	12/19/2018 10:29:50 AM
Toluene	0.053	0.047	mg/Kg	1	12/19/2018 10:29:50 AM
Ethylbenzene	ND	0.047	mg/Kg	1	12/19/2018 10:29:50 AM
Xylenes, Total	ND	0.093	mg/Kg	1	12/19/2018 10:29:50 AM
Surr: 4-Bromofluorobenzene	100	80-120	%Rec	1	12/19/2018 10:29:50 AM

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 3 of 8
	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

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** HILCORP ENERGY

**Project:** OH Randel 5

Lab ID: 1812913-004

Client Sample ID: BH-32 50-57' Collection Date: 12/14/2018 2:00:00 PM Received Date: 12/15/2018 4:00:00 PM

Analyses	Result	PQL Qua	l Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	12/20/2018 8:16:00 AM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	12/20/2018 8:16:00 AM
Surr: DNOP	90.6	50.6-138	%Rec	1	12/20/2018 8:16:00 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	12/18/2018 8:43:18 PM
Surr: BFB	96.4	73.8-119	%Rec	1	12/18/2018 8:43:18 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	12/18/2018 8:43:18 PM
Toluene	ND	0.047	mg/Kg	1	12/18/2018 8:43:18 PM
Ethylbenzene	ND	0.047	mg/Kg	1	12/18/2018 8:43:18 PM
Xylenes, Total	ND	0.093	mg/Kg	1	12/18/2018 8:43:18 PM
Surr: 4-Bromofluorobenzene	97.6	80-120	%Rec	1	12/18/2018 8:43:18 PM

Matrix: SOIL

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 4 of 8
	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.

Client:	HILCOR		Y								
Project:	OH Rand	el 5									
Sample ID	LCS-42138	SampT	ype: LC	S	Test	tCode: EF	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	LCSS	Batch	h ID: 421	138	R	unNo: 50	6379				
Prep Date:	12/17/2018	Analysis D	)ate: 12	2/17/2018	S	eqNo: 1	885000	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range O	organics (DRO)	56	10	50.00	0	112	70	130			
Surr: DNOP		4.5		5.000		90.6	50.6	138			
Sample ID	MB-42138	SampT	уре: <b>МЕ</b>	BLK	Test	tCode: EF	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	PBS	Batch	h ID: 421	138	R	unNo: 5	6379				
Prep Date:	12/17/2018	Analysis D	)ate: 12	2/17/2018	S	eqNo: 18	885001	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range O	0 1 7	ND	10								
	e Organics (MRO)	ND	50								
Surr: DNOP		10		10.00		103	50.6	138			
Sample ID	1812913-002AMS	SampT	уре: <b>МS</b>	5	Test	tCode: EF	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID:	BH-33 75-80'	Batch	h ID: 421	138	R	unNo: 5	6379				
Prep Date:	12/17/2018	Analysis D	)ate: 12	2/17/2018	S	eqNo: 18	885959	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range O	Organics (DRO)	270	9.9	49.31	178.0	196	53.5	126			S
Surr: DNOP											3
		5.1		4.931		104	50.6	138			3
Sample ID	1812913-002AMSI		уре: <b>МS</b>		Tesi			138 8015M/D: Die	esel Range	e Organics	
·	1812913-002AMSI BH-33 75-80'	D SampT	⊽pe: <b>MS</b> h ID: <b>42</b> 1	5D			PA Method		esel Range	e Organics	<u> </u>
Client ID:		D SampT	h ID: 42	5D 138	R	tCode: Ef	PA Method 6379		J	e Organics	
Client ID:	BH-33 75-80'	D SampT Batch	h ID: 42	6D 138 2/17/2018	R	Code: EF	PA Method 6379	8015M/D: Die	J	e Organics	Qual
Client ID: Prep Date: Analyte	BH-33 75-80' 12/17/2018	D SampT Batch Analysis D	h ID: 42 ⁻ Date: 12	6D 138 2/17/2018	R	tCode: EF	PA Method 6379 885960	8015M/D: Die Units: mg/K	íg	-	
Client ID: Prep Date: Analyte	BH-33 75-80' 12/17/2018	D SampT Batch Analysis D Result	h ID: 42 Date: 12 PQL	5D 138 2/17/2018 SPK value	R S SPK Ref Val	Code: EF tunNo: 50 seqNo: 18 %REC	PA Method 6379 885960 LowLimit	8015M/D: Die Units: <b>mg/K</b> HighLimit	<b>g</b> %RPD	RPDLimit	Qual
Client ID: Prep Date: Analyte Diesel Range O Surr: DNOP	BH-33 75-80' 12/17/2018	D SampT Batch Analysis D Result 300 5.2	h ID: 42 Date: 12 PQL	5D 138 2/17/2018 SPK value 49.07 4.907	R S SPK Ref Val 178.0	Code: EF SunNo: 56 SeqNo: 18 %REC 247 106	PA Method 6379 885960 LowLimit 53.5 50.6	8015M/D: Die Units: mg/K HighLimit 126	<b>5</b> <b>%</b> RPD 8.69 0	RPDLimit 21.7 0	Qual
Client ID: Prep Date: Analyte Diesel Range O Surr: DNOP Sample ID	BH-33 75-80' 12/17/2018 Drganics (DRO)	D SampT Batch Analysis D Result 300 5.2 SampT	h ID: <b>42</b> Date: <b>12</b> PQL 9.8	5D 138 2/17/2018 SPK value 49.07 4.907	R S SPK Ref Val 178.0 Test	Code: EF SunNo: 56 SeqNo: 18 %REC 247 106	PA Method 6379 885960 LowLimit 53.5 50.6 PA Method	8015M/D: Die Units: mg/K HighLimit 126 138	<b>5</b> <b>%</b> RPD 8.69 0	RPDLimit 21.7 0	Qual
Client ID: Prep Date: Analyte Diesel Range O Surr: DNOP Sample ID Client ID:	BH-33 75-80' 12/17/2018 Drganics (DRO) 1812913-001AMS	D SampT Batch Analysis D Result 300 5.2 SampT	PQL 9.8 7ype: MS	5D 138 2/17/2018 SPK value 49.07 4.907 5 177	R S SPK Ref Val 178.0 Tesi R	Code: EF SunNo: 56 SeqNo: 18 %REC 247 106 tCode: EF	PA Method 6379 885960 LowLimit 53.5 50.6 PA Method 6431	8015M/D: Die Units: mg/K HighLimit 126 138	<b>3</b> <u>%RPD</u> 8.69 0 esel Range	RPDLimit 21.7 0	Qual
Client ID: Prep Date: Analyte Diesel Range O Surr: DNOP Sample ID Client ID:	BH-33 75-80' 12/17/2018 Drganics (DRO) 1812913-001AMS BH-33 30-35'	D SampT Batch Analysis D Result 300 5.2 SampT Batch	PQL 9.8 7ype: MS	5D 138 2/17/2018 SPK value 49.07 4.907 5 177 2/20/2018	R S SPK Ref Val 178.0 Tesi R	Code: EF SunNo: 50 SeqNo: 11 %REC 247 106 Code: EF	PA Method 6379 885960 LowLimit 53.5 50.6 PA Method 6431	8015M/D: Die Units: mg/K HighLimit 126 138 8015M/D: Die	<b>3</b> <u>%RPD</u> 8.69 0 esel Range	RPDLimit 21.7 0	Qual
Client ID: Prep Date: Analyte Diesel Range O Surr: DNOP Sample ID Client ID: Prep Date:	BH-33 75-80' 12/17/2018 Drganics (DRO) 1812913-001AMS BH-33 30-35' 12/18/2018	D SampT Batch Analysis D Result 300 5.2 SampT Batch Analysis D	n ID:       42'         Date:       12         PQL       9.8         Type:       MS         n ID:       42'         Date:       12	5D 138 2/17/2018 SPK value 49.07 4.907 5 177 2/20/2018	R SPK Ref Val 178.0 Test R S	Code: EF SunNo: 56 SeqNo: 18 %REC 247 106 Code: EF SunNo: 56 SeqNo: 18	PA Method 6379 885960 LowLimit 53.5 50.6 PA Method 6431 889462	8015M/D: Die Units: mg/K HighLimit 126 138 8015M/D: Die Units: mg/K	2 9 8.69 0 esel Rango	RPDLimit 21.7 0	Qual S

#### **Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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 5 of 8

## QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#: 1812913 03-Jan-19

## Client:HILCORP ENERGYProject:OH Randel 5

Sample ID 1812913-001AMSD	SampT	ype: <b>M</b> \$	SD	Test	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID: BH-33 30-35'	Batch	ID: 42	177	R	unNo: 5	6431				
Prep Date: 12/18/2018	Analysis D	ate: 12	2/20/2018	S	eqNo: 1	889463	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	140	9.3	46.34	140.5	-10.1	53.5	126	52.5	21.7	RS
Surr: DNOP	4.3		4.634		92.1	50.6	138	0	0	

#### **Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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 6 of 8

## QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

03-Jan-19

Client: HILCOF Project: OH Rand	RP ENERGY del 5			
Sample ID MB-42127 Client ID: PBS	SampType: <b>MBLK</b> Batch ID: <b>42127</b>	RunNo: 56380	8015D: Gasoline Range	
Prep Date: 12/14/2018 Analyte Surr: BFB	Analysis Date: 12/17/2018 Result PQL SPK value 990 1000	SeqNo: 1885502 SPK Ref Val %REC LowLimit 98.9 73.8	Units: <b>%Rec</b> HighLimit %RPD RPDL 119	imit Qual
Sample ID LCS-42127 Client ID: LCSS Prep Date: 12/14/2018 Analyte		RunNo: <b>56380</b> SeqNo: <b>1885503</b> SPK Ref Val %REC LowLimit	8015D: Gasoline Range Units: %Rec HighLimit %RPD RPDL	imit Qual
Surr: BFB Sample ID B9 Client ID: PBS Prep Date:	1100 1000 SampType: MBLK Batch ID: G56380 Analysis Date: 12/17/2018	113 73.8 TestCode: EPA Method RunNo: 56380 SeqNo: 1885527	119 8015D: Gasoline Range Units: mg/Kg	
Analyte Gasoline Range Organics (GRO) Surr: BFB	Result PQL SPK value ND 5.0 970 1000	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDL	imit Qual
Sample ID 2.5UG GRO LCS Client ID: LCSS Prep Date:	SampType: LCS Batch ID: G56380 Analysis Date: 12/17/2018	TestCode: <b>EPA Method</b> RunNo: <b>56380</b> SeqNo: <b>1885528</b>	8015D: Gasoline Range Units: mg/Kg	
Client ID: LCSS	Batch ID: <b>G56380</b> Analysis Date: <b>12/17/2018</b>	RunNo:         56380           SeqNo:         1885528           SPK Ref Val         %REC         LowLimit           0         97.3         80.1	-	imit Qual
Client ID: LCSS Prep Date: Analyte Gasoline Range Organics (GRO)	Batch ID:         G56380           Analysis Date:         12/17/2018           Result         PQL         SPK value           24         5.0         25.00	RunNo: 56380           SeqNo: 1885528           SPK Ref Val         %REC         LowLimit           0         97.3         80.1           115         73.8	Units: <b>mg/Kg</b> HighLimit %RPD RPDL 123	imit Qual
Client ID: LCSS Prep Date: Analyte Gasoline Range Organics (GRO) Surr: BFB Sample ID MB-42158 Client ID: PBS	Batch ID:       G56380         Analysis Date:       12/17/2018         Result       PQL       SPK value         24       5.0       25.00         1100       1000         SampType:       MBLK         Batch ID:       42158         Analysis Date:       12/18/2018	RunNo: 5380SeqNo: 185528SPK Ref Val%REC097.380.111573.8TestCode: EPA MethodRunNo: 5429SeqNo: 1886718SPK Ref Val%RECLowLimit	Units: mg/Kg HighLimit %RPD RPDL 123 119 8015D: Gasoline Range Units: mg/Kg	
Client ID: LCSS Prep Date: Analyte Gasoline Range Organics (GRO) Surr: BFB Sample ID MB-42158 Client ID: PBS Prep Date: 12/17/2018 Analyte Gasoline Range Organics (GRO)	Batch ID:       G56380         Analysis Date:       12/17/2018         Result       PQL       SPK value         24       5.0       25.00         1100       1000         SampType:         Batch ID:       42158         Analysis Date:       12/18/2018         Result       PQL       SPK value         0       5.0	RunNo::       5380         SeqNo::       185528         SPK Ref Val       %REC       LowLimit         0       97.3       80.1         115       73.8         Testore:       FW         Kethod         RunNo::       56429         SeqNo::       18         SPK Ref Val       %REC       LowLimit         101       73.8	Units: mg/Kg HighLimit %RPD RPDL 123 119 8015D: Gasoline Range Units: mg/Kg HighLimit %RPD RPDL	

#### **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 7 of 8

•	vironmen			Laborat	ory, Inc.					WO#:	1812913 03-Jan-19
Client: Project:	HILCO OH Ra	ORP ENERG	Y								
Sample ID	MB-42127	SampT	ype: ME	BLK	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batch	n ID: 42	127	F	anNo: 5	6380				
Prep Date:	12/14/2018	Analysis D	ate: 12	2/17/2018	5	SeqNo: 1	885539	Units: mg/k	٨g		
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	ofluorobonzono	ND	0.10	1 000		100	90	100			
SUIT: 4-BIOIT	nofluorobenzene	1.0		1.000		103	80	120			
•	LCS-42127	SampT	ype: LC	S	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batch	n ID: 42	127	F	RunNo: 5	6380				
Prep Date:	12/14/2018	Analysis D	ate: 12	2/17/2018	5	SeqNo: 1	885540	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.95	0.025	1.000	0	94.6	80	120			
Toluene		1.0	0.050	1.000	0	99.6	80	120			
Ethylbenzene		1.0	0.050	1.000	0	100	80	120			
Xylenes, Total Surr: 4-Brom	nofluorobenzene	3.1 1.1	0.10	3.000 1.000	0	102 107	80 80	120 120			
Sample ID			ype: ME					8021B: Vola	tiles		
Client ID:	PBS		n ID: 42			lunNo: 5			_		
Prep Date:	12/17/2018	Analysis D	ate: 12	2/18/2018	5	SeqNo: 1	886748	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 Xylenes, Total		ND ND	0.050 0.10								
<b>,</b>	nofluorobenzene	1.0	0.10	1.000		105	80	120			
Sample ID	LCS-42158	SamnT	vne: 10	's	Tes	tCode: E	PA Method	8021B: Vola	tilos		
Client ID:				TestCode: EPA Method 8021B: Volatiles RunNo: 56429							
	12/17/2018	Analysis D				SeqNo: 1		Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.95	0.025	1.000	0	95.3	80	120			
Toluene		1.0	0.050	1.000	0	100	80	120			
Ethylbenzene		1.0	0.050	1.000	0	101	80	120			
Xylenes, Total		3.1	0.10	3.000	0	103	80	120			
Surr: 4-Brom	nofluorobenzene	1.1		1.000		105	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 8 of 8

WO#· 1812913

HALL ENVIRONMENTAL ANALYSIS LABORATORY	TEL: 505-345-35	4901 Hawl Ubuquerque, NM	tins NE 187109 Sar 5-4107	Sample Log-In Check List				
Client Name: HILCORP ENERGY FAR	Work Order Numb	ber: 1812913		RcptNo: 1				
Completed By: Erin Melendrez 12 Reviewed By: DAD 12-17-18	2/15/2018 4:00:00 2/17/2018 8:15:11		and the MA	-				
LB: JU 12.17/14								
Chain of Custody			222					
1, Is Chain of Custody complete?		Yes 🗹	No 🗌	Not Present				
<ol><li>How was the sample delivered?</li></ol>		Courier						
Log In		142122	1011 July 1					
3. Was an attempt made to cool the samples?		Yes 🖌	No	NA 🗌				
<ol><li>Were all samples received at a temperature of a</li></ol>	>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 🖌	No 🗔					
7. Are samples (except VOA and ONG) properly pr	eserved?	Yes 🔽	No 🗌					
8. Was preservative added to bottles?		Yes 🗌	No 🗹	NA 🗌				
9. VOA vials have zero headspace?		Yes 🗆	No 🗌	No VOA Vials				
0. Were any sample containers received broken?		Yes 🗆	No 🗹	# of preserved bottles checked	/			
<ol> <li>Does paperwork match bottle labels? (Note discrepancies on chain of custody)</li> </ol>		Yes 🗹	No 🗌	for pH:	12 unless noted)			
2. Are matrices correctly identified on Chain of Cus	tody?	Yes 🗹	No 🗌	Adjusted?	0			
3. Is it clear what analyses were requested?		Yes 🗹	No 🗌	/	2.17.12			
<ol> <li>Were all holding times able to be met? (If no, notify customer for authorization.)</li> </ol>		Yes 🗹	No 🗌	Checked by: [	0 11.14			
Special Handling (if applicable)								
15. Was client notified of all discrepancies with this	order?	Yes 🗌	No 🗌	NA 🗹				
Person Notified: By Whom: Regarding: Client Instructions:	Date: Via:	eMail 🗌	Phone 🗌 Fax	In Person				
16. Additional remarks:								
17. <u>Cooler Information</u> Cooler No   Temp °C   Condition   Seal I	ntact Seal No	Seal Date	Signed By	Ē				
1 1.7 Good Yes	indot ocarino	Jear Date	Signed by					

	JL A							(N	N OI	) zəldduA ilA							wo.	(75-30)
	HALL ENVIRONMENTAL ANALYSIS LABORATORY	www.hallenvironmental.com	4901 Hawkins NF - Albuminerine Nik 87109	Eav FOR 246 4107		(*(	05'*0	9,808,1	Səl ON Sle	49 M 8 A9729 40,001 8 Meticio 7007 9 Pesticio 7007 80828 7-im92) 0728							cc: dhencmann @leanv.com	Ecarroll @ Items. com H-33 (125-134) to BH-33
	IALL	ed www	AN SU	505-345-3075	10000	-	(SM			EDB (Methoo	_		-				-	
			Hawki	505-34		(0)				TPH (Method	×						Please	C hange
			4901	a F					_	BTEX + MTB		×	×	×			Remarks:	£ζε
-			_	T		(	1208)	s'amt	+ 30	I BTEX ¹ MTB	×	×	×	×			Rem	Per
	d ( Kush BH-33 125-130		indel #5			0.00	Ciora cordova-'Hillor? Deven Henemann-1+F	COVIOI	1	Preservative HEAL No. # Type 1317913	Cap1 -001	1 -002	-003	- POH			Slart 12/18 1730	La 12/15/18 1600
Turn-Aroun	₩ Standard	Project Name:	CH Rand	Project #:	_	Project Mai	Deven	Sampler: Exic	Sample Temperature:	Container Type and #	1402	-		Y			Received by:	Received by:
Chain-of-Custody Record		Cardova			76-382-1096	Cardoza@hilerpian Project Manager:	I aval 4 (Full Validation)	Ja		Sample Request ID	84-33 30-35'	84-33 125-130'	84-32 40-45'	BH - 32 50-571			Level	MONT WOOD (
of-CL	I di	Con	1		- 385 -	trees		□ Other	202	Matrix	1:05	-		>1			Relinquished by:	Relinquished by:
hain	Hilcorg	Clara	Mailing Address:			email or Fax#:4	Package:	tation 4.P	(Tvpe)	Time	1330	0860	100	1400			Time:	Time:
0	Client:	,	Mailing		Phone #:	email or	QA/QC Package:	Accreditation	R EDD (Tvpe)	Date	12/13	41/21	Pild	m/ti				5



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

December 21, 2018

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

OrderNo.: 1812985

RE: OH Randel 5

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 12 sample(s) on 12/18/2018 for the analyses presented in the following report.

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

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

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

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Analytical Report
Lab Order 1812985

Date Reported: 12/21/2018

### Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

Project: OH Randel 5

Client Sample ID: BH-34 55-60' Collection Date: 12/15/2018 11:30:00 AM Received Date: 12/18/2018 8:05:00 AM

Matrix: SOIL	R	leceive	ed Date:	12/18/2	2018 8:05:00 AM
Result	PQL	Qual	Units	DF	Date Analyzed
E ORGANICS					Analyst: Irm
350	8.9		mg/Kg	1	12/19/2018 4:22:58 PM
ND	44		mg/Kg	1	12/19/2018 4:22:58 PM
90.9	50.6-138		%Rec	1	12/19/2018 4:22:58 PM
<b>SE</b>					Analyst: NSB
5300	480		mg/Kg	100	12/20/2018 11:06:56 AM
183	73.8-119	S	%Rec	100	12/20/2018 11:06:56 AM
					Analyst: NSB
15	0.24		mg/Kg	10	12/19/2018 3:18:10 PM
180	4.8		mg/Kg	100	12/20/2018 11:06:56 AM
22	0.48		mg/Kg	10	12/19/2018 3:18:10 PM
220	9.6		mg/Kg	100	12/20/2018 11:06:56 AM
112	80-120		%Rec	100	12/20/2018 11:06:56 AM
	Result E ORGANICS 350 ND 90.9 SE 5300 183 15 180 22 220	Result         PQL           E ORGANICS         350         8.9           ND         44           90.9         50.6-138           SE         5300         480           183         73.8-119           15         0.24           180         4.8           22         0.48           220         9.6	Result         PQL         Qual           E ORGANICS         350         8.9           ND         44           90.9         50.6-138           SE         5300         480           183         73.8-119         S           15         0.24         180           180         4.8         22           0.48         220         9.6	Result         PQL         Qual         Units           E ORGANICS         350         8.9         mg/Kg           ND         44         mg/Kg           90.9         50.6-138         %Rec           SE         5300         480         mg/Kg           183         73.8-119         S         %Rec           15         0.24         mg/Kg           180         4.8         mg/Kg           22         0.48         mg/Kg           220         9.6         mg/Kg	Result         PQL         Qual         Units         DF           E ORGANICS         350         8.9         mg/Kg         1           ND         44         mg/Kg         1           90.9         50.6-138         %Rec         1           SE         5300         480         mg/Kg         100           183         73.8-119         S         %Rec         100           15         0.24         mg/Kg         10           180         4.8         mg/Kg         100           22         0.48         mg/Kg         10           220         9.6         mg/Kg         10

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 Page 1 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Analytical Report
Lab Order 1812985

Date Reported: 12/21/2018

### Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

OH Randel 5

Project:

Client Sample ID: BH-34 75-77' Collection Date: 12/15/2018 12:40:00 PM Received Date: 12/18/2018 8:05:00 AM

Lab ID: 1812985-002	Matrix: SOIL	Re	ceived Date:	12/18/	/2018 8:05:00 AM
Analyses	Result	PQL Q	Qual Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	EORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	170	8.6	mg/Kg	1	12/19/2018 4:47:23 PM
Motor Oil Range Organics (MRO)	ND	43	mg/Kg	1	12/19/2018 4:47:23 PM
Surr: DNOP	92.1	50.6-138	%Rec	1	12/19/2018 4:47:23 PM
EPA METHOD 8015D: GASOLINE RANG	Ε				Analyst: NSB
Gasoline Range Organics (GRO)	1700	25	mg/Kg	5	12/19/2018 3:40:50 PM
Surr: BFB	773	73.8-119	S %Rec	5	12/19/2018 3:40:50 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	1.9	0.12	mg/Kg	5	12/19/2018 3:40:50 PM
Toluene	49	2.5	mg/Kg	50	12/20/2018 11:29:38 AM
Ethylbenzene	9.0	0.25	mg/Kg	5	12/19/2018 3:40:50 PM
Xylenes, Total	86	5.0	mg/Kg	50	12/20/2018 11:29:38 AM
Surr: 4-Bromofluorobenzene	112	80-120	%Rec	50	12/20/2018 11:29:38 AM

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 Page 2 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Analytical Report Lab Order 1812985

Date Reported: 12/21/2018

### Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

**Project:** OH Randel 5

Client Sample ID: BH-35 55-60' Collection Date: 12/15/2018 5:00:00 PM Received Date: 12/18/2018 8:05:00 AM

Lab ID: 1812985-003	Matrix: SOIL	Rece	ived Date:	12/18/	/2018 8:05:00 AM
Analyses	Result	PQL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	12/19/2018 5:11:55 PM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	12/19/2018 5:11:55 PM
Surr: DNOP	91.9	50.6-138	%Rec	1	12/19/2018 5:11:55 PM
EPA METHOD 8015D: GASOLINE RANG	GE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	12/19/2018 5:34:14 PM
Surr: BFB	88.1	73.8-119	%Rec	1	12/19/2018 5:34:14 PM
EPA METHOD 8021B: VOLATILES					Analyst: <b>NSB</b>
Benzene	ND	0.024	mg/Kg	1	12/19/2018 5:34:14 PM
Toluene	ND	0.048	mg/Kg	1	12/19/2018 5:34:14 PM
Ethylbenzene	ND	0.048	mg/Kg	1	12/19/2018 5:34:14 PM
Xylenes, Total	ND	0.096	mg/Kg	1	12/19/2018 5:34:14 PM
Surr: 4-Bromofluorobenzene	102	80-120	%Rec	1	12/19/2018 5:34:14 PM

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 Page 3 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Date Reported: 12/21/2018

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

**Project:** OH Randel 5

Client Sample ID: BH-35 45-50' Collection Date: 12/15/2018 3:40:00 PM Received Date: 12/18/2018 8:05:00 AM

Lab ID: 1812985-004	Matrix: SOIL         Received Date: 12/18/2018 8:05:00 AN				/2018 8:05:00 AM
Analyses	Result	PQL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	EORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.0	mg/Kg	1	12/19/2018 5:36:14 PM
Motor Oil Range Organics (MRO)	ND	45	mg/Kg	1	12/19/2018 5:36:14 PM
Surr: DNOP	91.5	50.6-138	%Rec	1	12/19/2018 5:36:14 PM
EPA METHOD 8015D: GASOLINE RANG	Ε				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	12/19/2018 5:57:00 PM
Surr: BFB	87.9	73.8-119	%Rec	1	12/19/2018 5:57:00 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	12/19/2018 5:57:00 PM
Toluene	ND	0.049	mg/Kg	1	12/19/2018 5:57:00 PM
Ethylbenzene	ND	0.049	mg/Kg	1	12/19/2018 5:57:00 PM
Xylenes, Total	ND	0.097	mg/Kg	1	12/19/2018 5:57:00 PM
Surr: 4-Bromofluorobenzene	101	80-120	%Rec	1	12/19/2018 5:57:00 PM

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 Page 4 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Date Reported: 12/21/2018

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

**Project:** OH Randel 5

Client Sample ID: BH-36 50-55' Collection Date: 12/16/2018 1:00:00 PM Received Date: 12/18/2018 8:05:00 AM

Lab ID: 1812985-005	Matrix: SOIL         Received Date: 12/18/2018 8:05:00				/2018 8:05:00 AM
Analyses	Result	PQL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	10	mg/Kg	1	12/19/2018 6:00:38 PM
Motor Oil Range Organics (MRO)	ND	50	mg/Kg	1	12/19/2018 6:00:38 PM
Surr: DNOP	92.6	50.6-138	%Rec	1	12/19/2018 6:00:38 PM
EPA METHOD 8015D: GASOLINE RANG	E				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	12/19/2018 6:19:43 PM
Surr: BFB	88.1	73.8-119	%Rec	1	12/19/2018 6:19:43 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	12/19/2018 6:19:43 PM
Toluene	0.049	0.047	mg/Kg	1	12/19/2018 6:19:43 PM
Ethylbenzene	ND	0.047	mg/Kg	1	12/19/2018 6:19:43 PM
Xylenes, Total	ND	0.095	mg/Kg	1	12/19/2018 6:19:43 PM
Surr: 4-Bromofluorobenzene	101	80-120	%Rec	1	12/19/2018 6:19:43 PM

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 Page 5 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Date Reported: 12/21/2018

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

Project: OH Randel 5

Client Sample ID: BH-36 55-60' Collection Date: 12/16/2018 1:40:00 PM

Lab ID: 1812985-006	Matrix: SOIL	Rece	<b>Received Date:</b> 12/18/2018 8:05:00 AM				
Analyses	Result	PQL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: Irm		
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	12/19/2018 6:24:52 PM		
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	12/19/2018 6:24:52 PM		
Surr: DNOP	93.6	50.6-138	%Rec	1	12/19/2018 6:24:52 PM		
EPA METHOD 8015D: GASOLINE RA	ANGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	12/19/2018 7:05:16 PM		
Surr: BFB	85.1	73.8-119	%Rec	1	12/19/2018 7:05:16 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.024	mg/Kg	1	12/19/2018 7:05:16 PM		
Toluene	0.049	0.049	mg/Kg	1	12/19/2018 7:05:16 PM		
Ethylbenzene	ND	0.049	mg/Kg	1	12/19/2018 7:05:16 PM		
Xylenes, Total	ND	0.098	mg/Kg	1	12/19/2018 7:05:16 PM		
Surr: 4-Bromofluorobenzene	97.2	80-120	%Rec	1	12/19/2018 7:05:16 PM		

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 Page 6 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/21/2018
Client Sample ID: BH-31 20-25'

CLIENT: HILCORP ENERGY	Client Sample ID: BH-31 20-25'					
Project: OH Randel 5	Collection Date: 12/16/2018 4:00:00 PM					
Lab ID: 1812985-007	Matrix: SOIL         Received Date: 12/18/2018 8:05:00 AM					
Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS					Analyst: Irm
Diesel Range Organics (DRO)	280	9.7		mg/Kg	1	12/19/2018 6:49:07 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/19/2018 6:49:07 PM
Surr: DNOP	87.4	50.6-138		%Rec	1	12/19/2018 6:49:07 PM
EPA METHOD 8015D: GASOLINE RANGI	E					Analyst: NSB
Gasoline Range Organics (GRO)	3400	240		mg/Kg	50	12/20/2018 11:52:27 AM
Surr: BFB	249	73.8-119	S	%Rec	50	12/20/2018 11:52:27 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	1.3	0.024		mg/Kg	1	12/19/2018 7:50:45 PM
Toluene	100	2.4		mg/Kg	50	12/20/2018 11:52:27 AM
Ethylbenzene	13	2.4		mg/Kg	50	12/20/2018 11:52:27 AM
Xylenes, Total	180	4.7		mg/Kg	50	12/20/2018 11:52:27 AM
Surr: 4-Bromofluorobenzene	116	80-120		%Rec	50	12/20/2018 11:52:27 AM

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

Qualifiers: * Value exceeds Maximum Contaminant Level.

- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits Page 7 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/21/2018

	<b>v v</b> <i>i</i>			Dui		
CLIENT: HILCORP ENERGY		Client S	Sample ID:	BH-31	30-33'	
<b>Project:</b> OH Randel 5	Collection Date: 12/16/2018 4:20:00 PM					
Lab ID: 1812985-008	Matrix: SOIL	Matrix:         SOIL         Received Date: 12/18/2018 8:05:00 AM				
Analyses	Result	PQL Qua	al Units	DF	Date Analyzed	
EPA METHOD 8015M/D: DIESEL F	RANGE ORGANICS				Analyst: <b>JME</b>	
Diesel Range Organics (DRO)	440	9.7	mg/Kg	1	12/18/2018 9:24:07 AM	
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	12/18/2018 9:24:07 AM	
Surr: DNOP	100	50.6-138	%Rec	1	12/18/2018 9:24:07 AM	
EPA METHOD 8260B: VOLATILES	SHORT LIST				Analyst: AG	
Benzene	30	4.4	mg/Kg	200	12/18/2018 8:21:37 PM	
Toluene	360	8.9	mg/Kg	200	12/18/2018 8:21:37 PM	
Ethylbenzene	36	8.9	mg/Kg	200	12/18/2018 8:21:37 PM	
Xylenes, Total	360	18	mg/Kg	200	12/18/2018 8:21:37 PM	
Surr: 4-Bromofluorobenzene	104	70-130	%Rec	200	12/18/2018 8:21:37 PM	
Surr: Toluene-d8	99.8	70-130	%Rec	200	12/18/2018 8:21:37 PM	
EPA METHOD 8015D MOD: GASO	LINE RANGE				Analyst: AG	

EPA METHOD 8015D MOD: GASOLINE RANGE					Analyst: AG
Gasoline Range Organics (GRO)	9600	890	mg/Kg	200	12/18/2018 8:21:37 PM
Surr: BFB	95.0	70-130	%Rec	200	12/18/2018 8:21:37 PM

Qualifiers: *	Value exceeds Maximum	Contaminant Level.
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- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- Not Detected at the Reporting Limit ND
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- Analyte detected in the associated Method Blank В
- Е Value above quantitation range
- Analyte detected below quantitation limits Page 8 of 18 J
- Sample pH Not In Range Р
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/21/2018

CLIENT:	HILCORP ENERGY	

1812985-009

**Project:** OH Randel 5

Lab ID:

Client Sample ID: BH-28 0-10' Collection Date: 12/17/2018 9:00:00 AM Matrix: SOIL

Received Date: 12/18/2018 8:05:00 AM

Analyses	Result	PQL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.9	mg/Kg	1	12/19/2018 7:13:22 PM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	12/19/2018 7:13:22 PM
Surr: DNOP	86.5	50.6-138	%Rec	1	12/19/2018 7:13:22 PM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	7.0	4.9	mg/Kg	1	12/20/2018 12:15:12 PM
Surr: BFB	104	73.8-119	%Rec	1	12/20/2018 12:15:12 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.025	mg/Kg	1	12/20/2018 12:15:12 PM
Toluene	0.21	0.049	mg/Kg	1	12/20/2018 12:15:12 PM
Ethylbenzene	ND	0.049	mg/Kg	1	12/20/2018 12:15:12 PM
Xylenes, Total	0.38	0.099	mg/Kg	1	12/20/2018 12:15:12 PM
Surr: 4-Bromofluorobenzene	103	80-120	%Rec	1	12/20/2018 12:15:12 PM

- 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
- Analyte detected in the associated Method Blank В
- Е Value above quantitation range
- Analyte detected below quantitation limits Page 9 of 18 J
- Sample pH Not In Range Р
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 12/21/2018

CLIENT:	HILCORP ENERGY

Project:	OH Randel 5
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Lab ID: 1812985-010

Client Sample ID: BH-28 30-35' Collection Date: 12/17/2018 10:00:00 AM Received Date: 12/18/2018 8:05:00 AM

Analyses	Result	PQL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.3	mg/Kg	1	12/19/2018 7:37:41 PM
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	12/19/2018 7:37:41 PM
Surr: DNOP	87.8	50.6-138	%Rec	1	12/19/2018 7:37:41 PM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6	mg/Kg	1	12/19/2018 8:36:07 PM
Surr: BFB	90.2	73.8-119	%Rec	1	12/19/2018 8:36:07 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	12/19/2018 8:36:07 PM
Toluene	ND	0.046	mg/Kg	1	12/19/2018 8:36:07 PM
Ethylbenzene	ND	0.046	mg/Kg	1	12/19/2018 8:36:07 PM
Xylenes, Total	ND	0.092	mg/Kg	1	12/19/2018 8:36:07 PM
Surr: 4-Bromofluorobenzene	88.6	80-120	%Rec	1	12/19/2018 8:36:07 PM

Matrix: SOIL

- 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 Page 10 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Date Reported: 12/21/2018

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** HILCORP ENERGY

OH Randel 5

**Project:** 

Client Sample ID: BH-29 10'-15' Collection Date: 12/17/2018 12:00:00 PM Received Date: 12/18/2018 8:05:00 AM

Lab ID: 1812985-011	Matrix: SOIL	Rece	<b>Received Date:</b> 12/18/2018 8:05:00 AM					
Analyses	Result	PQL Qu	al Units	DF	Date Analyzed			
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst: Irm			
Diesel Range Organics (DRO)	ND	9.5	mg/Kg	1	12/19/2018 8:01:51 PM			
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	12/19/2018 8:01:51 PM			
Surr: DNOP	87.6	50.6-138	%Rec	1	12/19/2018 8:01:51 PM			
EPA METHOD 8015D: GASOLINE RAN	GE				Analyst: NSB			
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	12/19/2018 8:58:50 PM			
Surr: BFB	89.8	73.8-119	%Rec	1	12/19/2018 8:58:50 PM			
EPA METHOD 8021B: VOLATILES					Analyst: NSB			
Benzene	ND	0.024	mg/Kg	1	12/19/2018 8:58:50 PM			
Toluene	ND	0.047	mg/Kg	1	12/19/2018 8:58:50 PM			
Ethylbenzene	ND	0.047	mg/Kg	1	12/19/2018 8:58:50 PM			
Xylenes, Total	ND	0.095	mg/Kg	1	12/19/2018 8:58:50 PM			
Surr: 4-Bromofluorobenzene	92.4	80-120	%Rec	1	12/19/2018 8:58:50 PM			

- 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 Page 11 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Date Reported: 12/21/2018

12/19/2018 9:21:34 PM

12/19/2018 9:21:34 PM

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

OH Randel 5

**Project:** 

Xylenes, Total

Surr: 4-Bromofluorobenzene

Client Sample ID: BH-29 27'-32' Collection Date: 12/17/2018 12:40:00 PM

Lab ID: 1812985-012 Matrix: SOIL Received Date: 12/18/2018 8:05:00 AM Result **PQL** Qual Units DF Analyses **Date Analyzed** EPA METHOD 8015M/D: DIESEL RANGE ORGANICS Analyst: Irm **Diesel Range Organics (DRO)** ND 9.5 mg/Kg 1 12/19/2018 8:26:10 PM Motor Oil Range Organics (MRO) ND 48 mg/Kg 1 12/19/2018 8:26:10 PM Surr: DNOP 88.8 50.6-138 %Rec 1 12/19/2018 8:26:10 PM **EPA METHOD 8015D: GASOLINE RANGE** Analyst: NSB Gasoline Range Organics (GRO) ND 12/19/2018 9:21:34 PM 4.7 mg/Kg 1 Surr: BFB 87.8 73.8-119 %Rec 1 12/19/2018 9:21:34 PM **EPA METHOD 8021B: VOLATILES** Analyst: NSB Benzene ND 0.023 12/19/2018 9:21:34 PM mg/Kg 1 Toluene ND 0.047 mg/Kg 1 12/19/2018 9:21:34 PM Ethylbenzene ND 0.047 mg/Kg 1 12/19/2018 9:21:34 PM

ND

93.1

0.094

80-120

mg/Kg

%Rec

1

1

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 Page 12 of 18
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

## QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

	ORP ENERGY andel 5							
Sample ID MB-42163	SampType: MBLK	TestCode: EPA Method	8015M/D: Diesel Range Organics					
Client ID: PBS	Batch ID: 42163	RunNo: 56397						
Prep Date: 12/18/2018	Analysis Date: 12/18/2018	SeqNo: 1885920	Units: <b>mg/Kg</b>					
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		400					
Surr: DNOP	9.6 10.00	95.6 50.6	138					
Sample ID LCS-42163	SampType: LCS	TestCode: EPA Method	8015M/D: Diesel Range Organics					
Client ID: LCSS	Batch ID: 42163	RunNo: 56397						
Prep Date: 12/18/2018	Analysis Date: 12/18/2018	SeqNo: 1885921	Units: mg/Kg					
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual				
Diesel Range Organics (DRO)	52 10 50.00	0 104 70	130					
Surr: DNOP	4.4 5.000	88.9 50.6	138					
Sample ID MB-42144	SampType: <b>MBLK</b>	TestCode: EPA Method	8015M/D: Diesel Range Organics					
Client ID: PBS	Batch ID: 42144	RunNo: 56397						
Prep Date: 12/17/2018	Analysis Date: 12/18/2018	SeqNo: 1886799	Units: %Rec					
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual				
Surr: DNOP	9.4 10.00	94.1 50.6	138	Qua				
Sample ID LCS-42144	SampType: LCS	TootCode: EDA Method	2015M/D: Dissel Banga Organias					
Client ID: LCSS	Batch ID: 42144	RunNo: 56397	8015M/D: Diesel Range Organics					
Prep Date: 12/17/2018	Analysis Date: 12/18/2018	SeqNo: 1886800	Units: %Rec					
Analyte		SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual				
Surr: DNOP	4.9 5.000	97.7 50.6	138					
Sample ID LCS-42188	SampType: LCS	TestCode: EPA Method	8015M/D: Diesel Range Organics					
Client ID: LCSS	Batch ID: 42188	RunNo: 56437						
Prep Date: 12/18/2018	Analysis Date: 12/19/2018	SeqNo: 1887450	Units: <b>mg/Kg</b>					
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual				
Diesel Range Organics (DRO)	41 10 50.00	0 81.7 70	130					
Surr: DNOP	4.0 5.000	80.3 50.6	138					
Sample ID MB-42188	SampType: MBLK	TestCode: EPA Method	8015M/D: Diesel Range Organics					
Client ID: PBS	Batch ID: 42188	RunNo: 56437						
Prep Date: 12/18/2018	Analysis Date: 12/19/2018	SeqNo: 1887451	Units: mg/Kg					
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual				
Diesel Range Organics (DRO)	ND 10			Quui				

#### **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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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

Client:HILCOProject:OH Ran	RP ENERG	iΥ								
Sample ID MB-42188	Samp	Гуре: МЕ	BLK	Tes	tCode: E	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID: PBS	Batc	h ID: 42	188	RunNo: <b>56437</b>						
Prep Date: 12/18/2018	Analysis [	Date: 12	2/19/2018	SeqNo: 1887451			Units: <b>mg/K</b>	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.6		10.00		85.5	50.6	138			

#### Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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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## QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#:	1812985
	21-Dec-18

Client:HILCOIProject:OH Ran	RP ENERG del 5	Y								
Sample ID MB-42176	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e	
Client ID: PBS	Batch	ID: 42	: <b>42176</b> RunNo: <b>56474</b>							
Prep Date: 12/18/2018	Analysis D	ate: 12	2/19/2018	S	SeqNo: 1	888431	Units: <b>mg/k</b>	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO) Surr: BFB	ND 900	5.0	1000		90.4	73.8	119			
Sample ID LCS-42176	SampType: LCS TestCode: EPA Method 8015D: Gasoline Range									
Client ID: LCSS	Batch	ID: 42	176	F	RunNo: 5	6474				
Prep Date: 12/18/2018	Analysis D	ate: 12	2/19/2018	S	SeqNo: 1	888432	Units: mg/k	(g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO) Surr: BFB	24 1100	5.0	25.00 1000	0	96.5 110	80.1 73.8	123 119			

#### 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 15 of 18

QC SUMMARY REPORT	
Hall Environmental Analysis Laboratory, Inc.	

21-Dec-18

## Client: HILCORP ENERGY

Project: OH Randel 5	
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Sample ID MB-42176	SampT	Type: ME	BLK	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID: PBS	Batc	h ID: 42	176	R	anNo: 5	6474				
Prep Date: 12/18/2018	Analysis E	Date: 12	2/19/2018	S	SeqNo: 1	888469	Units: <b>mg/k</b>	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-Bromofluorobenzene	1.0		1.000		100	80	120			
Sample ID LCS-42176	SampT	Type: LC	S	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Sample ID LCS-42176 Client ID: LCSS		Гуре: <b>LC</b> h ID: <b>42</b>			tCode: El RunNo: 5		8021B: Volat	tiles		
		h ID: 42	176	R		6474	8021B: Volat Units: mg/k			
Client ID: LCSS	Batc	h ID: 42	176 2/19/2018	R	aunNo: 5	6474			RPDLimit	Qual
Client ID:         LCSS           Prep Date:         12/18/2018	Batc Analysis [	h ID: 42 Date: 12	176 2/19/2018	R S	tunNo: <b>5</b> SeqNo: <b>1</b>	6474 888470	Units: mg/k	ſg	RPDLimit	Qual
Client ID: LCSS Prep Date: 12/18/2018 Analyte Benzene	Batc Analysis I Result	h ID: 42 Date: 12 PQL	176 2/19/2018 SPK value	R S SPK Ref Val	RunNo: <b>5</b> SeqNo: <b>1</b> %REC	6474 888470 LowLimit	Units: <b>mg/K</b> HighLimit	ſg	RPDLimit	Qual
Client ID: LCSS Prep Date: 12/18/2018 Analyte	Analysis E Result 0.81	h ID: <b>42</b> Date: <b>12</b> PQL 0.025	176 2/19/2018 SPK value 1.000	R S SPK Ref Val 0	RunNo: <b>5</b> SeqNo: <b>1</b> <u>%REC</u> 80.9	6474 888470 LowLimit 80	Units: <b>mg/k</b> HighLimit 120	ſg	RPDLimit	Qual
Client ID: LCSS Prep Date: 12/18/2018 Analyte Benzene Toluene	Batc Analysis E Result 0.81 0.90	h ID: 42 Date: 12 PQL 0.025 0.050	176 2/19/2018 SPK value 1.000 1.000	R S SPK Ref Val 0 0	RunNo: 5 SeqNo: 1 %REC 80.9 90.2	6474 888470 LowLimit 80 80	Units: <b>mg/K</b> HighLimit 120 120	ſg	RPDLimit	Qual

#### Qualifiers:

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

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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

## Client: HILCORP ENERGY

Project: OH Rande	15
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Sample ID 100ng lcs	Samp	ype: LC	S	Tes	tCode: El	PA Method	8260B: Volat	iles Short	List	
Client ID: LCSS	Batc	h ID: <b>A5</b>	6420	R	unNo: 5	6420				
Prep Date:	Analysis [	Date: 12	2/18/2018	S	eqNo: 1	886354	Units: mg/K	íg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	1.000	0	99.1	70	130			
Toluene	0.96	0.050	1.000	0	95.9	70	130			
Surr: 1,2-Dichloroethane-d4	0.51		0.5000		101	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		99.7	70	130			
Surr: Dibromofluoromethane	0.49		0.5000		98.6	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			
Sample ID <b>rb</b>	SampT	ype: ME	BLK	Tes	tCode: El	PA Method	8260B: Volat	iles Short	List	
Sample ID rb Client ID: PBS	•	ype: <b>ME</b> h ID: <b>A5</b>			tCode: El		8260B: Volat	iles Short	List	
	•	h ID: A5	6420	R		6420	8260B: Volat Units: mg/K		List	
Client ID: PBS	Batc	h ID: A5	6420 2/18/2018	R	unNo: 5	6420			List RPDLimit	Qual
Client ID: <b>PBS</b> Prep Date: Analyte	Batc Analysis [	h ID: A5 Date: 12	6420 2/18/2018	R S	tunNo: <b>5</b> SeqNo: <b>1</b>	6420 886362	Units: mg/K	g		Qual
Client ID: <b>PBS</b> Prep Date:	Batc Analysis I Result	h ID: A5 Date: 12 PQL	6420 2/18/2018	R S	tunNo: <b>5</b> SeqNo: <b>1</b>	6420 886362	Units: mg/K	g		Qual
Client ID: <b>PBS</b> Prep Date: Analyte Benzene	Batc Analysis E Result ND	h ID: A5 Date: 12 PQL 0.025	6420 2/18/2018	R S	tunNo: <b>5</b> SeqNo: <b>1</b>	6420 886362	Units: mg/K	g		Qual
Client ID: <b>PBS</b> Prep Date: Analyte Benzene Toluene	Analysis E Result ND ND	h ID: A5 Date: 12 PQL 0.025 0.050	6420 2/18/2018	R S	tunNo: <b>5</b> SeqNo: <b>1</b>	6420 886362	Units: mg/K	g		Qual
Client ID: <b>PBS</b> Prep Date: Analyte Benzene Toluene Ethylbenzene	Analysis E Result ND ND ND	h ID: A5 Date: 12 PQL 0.025 0.050 0.050	6420 2/18/2018	R S	tunNo: <b>5</b> SeqNo: <b>1</b>	6420 886362	Units: mg/K	g		Qual
Client ID: <b>PBS</b> Prep Date: Analyte Benzene Toluene Ethylbenzene Xylenes, Total	Analysis E Result ND ND ND ND ND	h ID: A5 Date: 12 PQL 0.025 0.050 0.050	6420 2/18/2018 SPK value	R S	anNo: 5 eqNo: 1 %REC	6420 886362 LowLimit	Units: <b>mg/K</b> HighLimit	g		Qual
Client ID: <b>PBS</b> Prep Date: Analyte Benzene Toluene Ethylbenzene Xylenes, Total Surr: 1,2-Dichloroethane-d4	Analysis I Result ND ND ND ND ND 0.51	h ID: A5 Date: 12 PQL 0.025 0.050 0.050	6420 2/18/2018 SPK value 0.5000	R S	anNo: 5 eqNo: 1 %REC	6420 886362 LowLimit	Units: <b>mg/K</b> HighLimit 130	g		Qual

#### Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified
- Page 17 of 18

## QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

## Client: HILCORP ENERGY

Randel 5

Sample ID 2.5ug gro Ics	SampT	ype: LC	S	Tes	tCode: El	PA Method	8015D Mod:	Gasoline	Range	
Client ID: LCSS	Batcl	h ID: <b>B5</b>	6420	F	RunNo: 5	6420				
Prep Date:	Analysis D	Date: 12	2/18/2018	5	SeqNo: 1	886341	Units: <b>mg/k</b>	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	92.0	70	130			
	400		<b>FOO O</b>		92.7	70	130			
Surr: BFB	460		500.0		92.7	70	130			
Sample ID rb		ype: ME			-	-	8015D Mod:	Gasoline	Range	
	SampT	ype: <b>ME</b> h ID: <b>B5</b>	BLK	Tes	-	PA Method		Gasoline	Range	
Sample ID rb	SampT	h ID: <b>B5</b>	BLK	Tes	tCode: El	PA Method			Range	
Sample ID rb Client ID: PBS	Samp1 Batcl	h ID: <b>B5</b>	3LK 6420 2/18/2018	Tes	tCode: El RunNo: 5	PA Method	8015D Mod:		Range RPDLimit	Qual
Sample ID <b>rb</b> Client ID: <b>PBS</b> Prep Date:	SampT Batcl Analysis E	h ID: <b>B5</b> Date: <b>1</b> 2	3LK 6420 2/18/2018	Tes F S	tCode: El RunNo: 5 SeqNo: 1	PA Method 6420 886342	8015D Mod: Units: mg/k	(g	U	Qual

#### Qualifiers:

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

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HALL ENVIRONMENTAL ANALYSIS LABORATORY	TEL: 505-345-3	ntal Analysis Labora 4901 Hawkin: Albuquerque, NM 87 8975 FAX: 505-345-4 w.hallenvironmental.	s NE 7109 <b>San</b> 4107	nple Log-In Che	ck List
Client Name: HILCORP ENERGY FAR	Work Order Nurr	ber: 1812985		RcptNo: 1	
Received By: Isaiah Ortiz	12/18/2018 8:05:00	MA	I-C Am In	X	
Completed By: Anne Thome Reviewed By: STAB 12/18/18	12/18/2018 8:33:3	I AM	Anne He	~	
Labeled by DAD 121	18/IR				
Chain of Custody	7.5				
1. Is Chain of Custody complete?		Yes 🗹	No 🗔	Not Present	
2. How was the sample delivered?		<u>Courier</u>			
Log In					
3. Was an attempt made to cool the samples	s?	Yes 🗹	No 🗌	NA 🗌	
4. Were all samples received at a temperatu	re of ≻0° C to 6.0°C	Yes 🗸	No 🗌	NA 🗌	
5. Sample(s) in proper container(s)?		Yes 🗹	No 🗌		
6. Sufficient sample volume for indicated test	t(s)?	Yes 🗹	No 🗌		
7. Are samples (except VOA and ONG) prop	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 bro	ken?	Yes 🗌	No 🗹 🏾	# of preserved	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)		Yes 🗹	No 🗆	for pH:	inless noted)
12. Are matrices correctly identified on Chain of	of Custody?	Yes 🗹	No 🗌	Adjusted?	
13. Is it clear what analyses were requested?	·	Yes 🖌	No 🗌		
14. Were all holding times able to be met? (If no, notify customer for authorization.)		Yes 🗹	No 🗌	Officeked by: DAD	12/18/18
<u>Special Handling (if applicable)</u>					
15. Was client notified of all discrepancies wit	h this order?	Yes	No 🗌	NA 🔽	
Person Notified:	Date				
By Whom:	Via:	eMail 🛄 Pl	hone 🗌 Fax	In Person	
Regarding:					
Client Instructions:					
16. Additional remarks:					
17. <u>Cooler Information</u>					
	Seal Intact Seal No	Seal Date	Signed By		

2	2.4	Good	Yes		

с С	hain-	of-CL	ustody	Chain-of-Custody Record	Turn-Around Time	Time:	Same Day 1215												
Client:	Hill	Hilcorp	Four C	Corners	I Standard	K Rush	Kush BH-31 30-33							ANAL VERTICATION AND ANALYSIS				łģ	5
:	Cla	lara C	5		Project Name:						Š	w.hall	enviro	www.hallenvironmental.com	al.con		ť		
Mailing	Mailing Address:		\$		OH RO	Randel #5			49	01 Ha	4901 Hawkins NE	י אנו	Albuc	Albuquerque, NM 87109	, NM	87109	_		
					Project #:		-		Tel.	əl. 505	505-345-3975	3975	Fax	( 505-;	505-345-4107	107			
Phone #:		70-3	970-385-16	1096								A	ıalysi		lest				
email or Fax#:	- Fax#:	ccar		@ hilcoro.com	روزیم Project Manager:	ger:	-	(		(0)			\ (					_	
QA/QC F	QA/QC Package:			-	CIUN	clara cardova	Va- Hilcorp	120		AMF	1. 	(9							
函 Standard	dard		Level 4	Level 4 (Full Validation)	Eri	Eric Con Dev	Devin Hencmann-LTE			/ Ő2	· · ·	SMIS							
Accreditation	tation ∢P	□ Other	J.		Sampler:	Eric Ca	Carroll Na									(\			(N 1
I EDD (Type)	(Type)_	PDF		and a second and a second and a second and a second and a second and a second and a second and a second and a s	E	oerature: こ、イ	ر. 1 ⁻² ا									/∩∧·		×	o Y)
Date	Time	Matrix		Sample Request ID	At 1>1819 Container Type and #	Preservative Type	HEAL No.	₩ +X∃TB	BTEX + MT	8015B	EDB (Metho	)rɛ8) ɛ'HA9	ARIORA 8 Me	O,F) enoinA 8081 Pestic	40V) 80928	-imə2) 0728			səlddu8 riA
12/15	1130	1:05	ВН-34	55-60	1402	Cool	20	ļ		X									
0/15 1340	1240		BH-34	75-77	1		202	2 X		×									·
ints.	1700		BH-35	BH-35 55-601	-		703	S X		X									
12/15	1540		BH -35	45-50'			TOP 1	×		×	94								
DIRC	1300		BH-36	50-55'			SUS	×		×									
ter/ite	iz40		BH-36	55-60'			pr-	×		×								_	
men	1600		Вн-зі	20-25'		~	102-	X		$\times$									
12/16	1620		BH-31	30-331			\$P	$\times$		~			_		+				
<i>[</i> 2/17	oqai		BH-78	<u>o -io'</u>		•	209	×		×								_	
17/17	loeo	<u></u>	BH-28	30-35'			012	× 0		$\times$								·	
711C	1200		BH-29	10'-15'			q	× 		×									
7	1240	7	66.	371-321	<b>~)</b>	×		7		×						_			
$\frac{1}{ 1 }$	1703	Kelinquished by:	led by:		Keegevee by:	Jut	1.51		Kemarks	Press Press	Please	Ś		dhenemanne Itenr. com	Ста	อน	lten	С0 И	ž
$\frac{Date}{13}$	Time: 1904	Relinquish	shed by:	A.	Received by:	COLN	Date Time $\frac{12}{16}$	0.00	١				Ψ	ecarroll	roll	G 12	ltenv.com	Col	_ع
	necessary	samples sut	omitted to Hall En	If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.	ontracted to other ac	credited laboratorie	s. This serves as notice o	f this pos	sibility.	Any sub	contract	ed data v	/ill be clt	arly notat	ed on th	e analytic	cal repor	L	



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

December 26, 2018

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

OrderNo.: 1812988

RE: OH Randel 5

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 1 sample(s) on 12/18/2018 for the analyses presented in the following report.

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

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

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

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Date Reported: 12/26/2018

Hall Environmental Anal	lysis Laboratory, Inc.	Date Reported: 12/26/20
CLIENT: HILCORP ENERGY		Client Sample ID: BH-33 100-105'
<b>Project:</b> OH Randel 5		Collection Date: 12/17/2018 3:40:00 PM
Lab ID: 1812988-001	Matrix: SOIL	<b>Received Date:</b> 12/18/2018 8:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE C	RGANICS					Analys	: Irm
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	12/21/2018 7:02:13 AN	42209
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/21/2018 7:02:13 AN	42209
Surr: DNOP	112	50.6-138		%Rec	1	12/21/2018 7:02:13 AN	42209
EPA METHOD 8015D: GASOLINE RANGE						Analyst	: NSB
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	12/19/2018 1:15:08 PM	l 42178
Surr: BFB	94.0	73.8-119		%Rec	1	12/19/2018 1:15:08 PM	l 42178
EPA METHOD 8021B: VOLATILES						Analys	: NSB
Benzene	ND	0.023		mg/Kg	1	12/19/2018 1:15:08 PN	l 42178
Toluene	0.093	0.046		mg/Kg	1	12/19/2018 1:15:08 PM	l 42178
Ethylbenzene	ND	0.046		mg/Kg	1	12/19/2018 1:15:08 PM	l 42178
Xylenes, Total	ND	0.093		mg/Kg	1	12/19/2018 1:15:08 PM	l 42178
Surr: 4-Bromofluorobenzene	96.6	80-120		%Rec	1	12/19/2018 1:15:08 PM	l 42178

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	В	A
	D	Sample Diluted Due to Matrix	Е	١
	Н	Holding times for preparation or analysis exceeded	J	A
	ND	Not Detected at the Reporting Limit	Р	S
	PQL	Practical Quanitative Limit	RL	F
	S	% Recovery outside of range due to dilution or matrix	W	S

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Analyte detected below quantitation limits Page 1 of 5
- Sample pH Not In Range
- Reporting Detection Limit
- Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#:	1812988
	26-Dec-18

Client:HILCOProject:OH Ran	RP ENERGY ndel 5		
Sample ID MB-42209	SampType: MBLK	TestCode: EPA Method	8015M/D: Diesel Range Organics
Client ID: PBS	Batch ID: 42209	RunNo: 56431	
Prep Date: 12/19/2018	Analysis Date: 12/20/2018	SeqNo: 1890230	Units: mg/Kg
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	ND 10		
Motor Oil Range Organics (MRO)	ND 50		
Surr: DNOP	12 10.00	118 50.6	138
Sample ID LCS-42209	SampType: LCS	TestCode: EPA Method	8015M/D: Diesel Range Organics
Client ID: LCSS	Batch ID: 42209	RunNo: 56431	
Prep Date: 12/19/2018	Analysis Date: 12/20/2018	SeqNo: 1890231	Units: mg/Kg
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	60 10 50.00	0 119 70	130
Surr: DNOP	5.4 5.000	109 50.6	138
Sample ID LCS-42209	SampType: LCS	TestCode: EPA Method	8015M/D: Diesel Range Organics
Client ID: LCSS	Batch ID: 42209	RunNo: 56431	
Prep Date: 12/19/2018	Analysis Date: 12/21/2018	SeqNo: 1890696	Units: mg/Kg
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	58 10 50.00	0 116 70	130
Surr: DNOP	5.9 5.000	118 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 2 of 5

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: 1812988 26-Dec-18

Client:	HILCORP EN	ERGY								
Project:	OH Randel 5									
Sample ID MB-42	<b>2178</b> S	ampType:	MBLK	Tes	tCode: EP	A Method	8015D: Gasol	ine Rang	e	
Client ID: PBS		Batch ID:	42178	F	RunNo: <b>56</b>	6473				
Prep Date: 12/1	8/2018 Anal	ysis Date:	12/19/2018	S	SeqNo: 18	88352	Units: mg/Kg	9		
Analyte	Re	sult PQ	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organ	, ,	-	.0							
Surr: BFB	9	950	1000		94.7	73.8	119			
Sample ID LCS-4	4 <b>2178</b> S	ampType:	LCS	Tes	tCode: EP	PA Method	8015D: Gasol	ine Rang	e	
Client ID: LCSS	;	Batch ID:	42178	RunNo: <b>56473</b>						
Prep Date: 12/1	8/2018 Anal	ysis Date:	12/19/2018	5	SeqNo: <b>18</b>	88353	Units: mg/Kg	g		
Analyte	Re	sult PQ	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organ	nics (GRO)	24 5	.0 25.00	0	97.8	80.1	123			
Surr: BFB	10	000	1000		101	73.8	119			
Sample ID MB-42	<b>2210</b> S	ampType:	MBLK	Tes	tCode: EP	PA Method	8015D: Gasol	ine Rang	e	
Client ID: PBS		Batch ID:	42210	F	RunNo: <b>56</b>	6489				
Prep Date: 12/1	9/2018 Anal	ysis Date:	12/20/2018	S	SeqNo: 18	89749	Units: %Rec			
Analyte	Re	sult PQ	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	٤	80	1000		87.8	73.8	119			
Sample ID LCS-4	42210 S	ampType:	LCS	Tes	tCode: EP	PA Method	8015D: Gasol	ine Rang	e	
Client ID: LCSS	;	Batch ID:	42210	F	RunNo: <b>56</b>	6489				
Prep Date: 12/1	9/2018 Anal	ysis Date:	12/20/2018	S	SeqNo: 18	89750	Units: %Rec			
	Re	sult PQ		SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Analyte	Rea	suit PQ	L SPK value		/orceo	LOWLINI	- ingite init			~~~~

#### 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 5

•	JMMARY wironmenta				ory, Inc.					WO#:	181298 26-Dec-18
Client: Project:	HILCOR OH Rand		θY								
Sample ID	MB-42178	Samp	Гуре: МВ	BLK	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batc	h ID: 42	178	F	RunNo: 5	6473				
Prep Date:	12/18/2018	Analysis [	Date: 12	2/19/2018	S	SeqNo: 1	888393	Units: <b>mg/l</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND	0.025					0			
Toluene		ND	0.050								
Ethylbenzene		ND	0.050								
Xylenes, Total		ND	0.10								
Surr: 4-Brom	ofluorobenzene	0.98		1.000		98.1	80	120			
Sample ID	LCS-42178	Samp ⁻	Гуре: <b>LC</b>	S	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batc	h ID: 42	178	F	RunNo: 5	6473				
Prep Date:	12/18/2018	Analysis [	Date: 12	2/19/2018	5	SeqNo: 1	888394	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.93	0.025	1.000	0	93.1	80	120			
Toluene		0.98	0.050	1.000	0	98.1	80	120			
Ethylbenzene		1.0	0.050	1.000	0	99.7	80	120			
Xylenes, Total		3.0	0.10	3.000	0	100	80	120			
Surr: 4-Brom	ofluorobenzene	0.99		1.000		99.2	80	120			
Sample ID	1812988-001AMS	Samp	Гуре: М	3	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	BH-33 100-105'	Batc	h ID: 42	178	F	RunNo: 5	6473				
Prep Date:	12/18/2018	Analysis [	Date: 12	2/19/2018	S	SeqNo: 1	888396	Units: mg/l	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		1.0	0.024	0.9425	0.02231	109	63.9	127			
Toluene		1.2	0.047	0.9425	0.09306	116	69.9	131			
Ethylbenzene		1.1	0.047	0.9425	0.01120	121	71	132			
Xylenes, Total		3.5	0.094	2.828	0.04935	122	71.8	131			
Surr: 4-Brom	ofluorobenzene	0.88		0.9425		93.2	80	120			
Sample ID	1812988-001AMS	D Samp	Гуре: М	SD	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID:	BH-33 100-105' Batch ID: 42178				RunNo: 56473						
Prep Date:	12/18/2018	Analysis [	Date: 12	2/19/2018	S	SeqNo: 1	888397	Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.98	0.023	0.9363	0.02231	102	63.9	127	6.49	20	
Toluene		1.1	0.047	0.9363	0.09306	111	69.9	131	4.60	20	
Ethylbenzene		1.1	0.047	0.9363	0.01120	115	71	132	5.06	20	
Xylenes, Total		3.3	0.094	2.809	0.04935	116	71.8	131	5.22	20	
Surr: 4-Brom	ofluorobenzene	0.89		0.9363		95.2	80	120	0	0	

#### **Qualifiers:**

* Value exceeds Maximum Contaminant Level.

**OC SUMMARY REPORT** 

- 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 5

## QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

WO#:	1812988					
	1CD 10					

## Client: HILCORP ENERGY

Project: C	H Randel 5
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Sample ID MB-42210	SampType: MBLK	TestCode: EPA Method	8021B: Volatiles					
Client ID: PBS	Batch ID: 42210	RunNo: 56489						
Prep Date: 12/19/2018	Analysis Date: 12/20/2018	SeqNo: 1889786	Units: %Rec					
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD	RPDLimit Qual				
Surr: 4-Bromofluorobenzene	0.92 1.000	91.6 80	120					
Sample ID LCS-42210	SampType: LCS TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 42210	RunNo: 56489						
Client ID: LCSS Prep Date: 12/19/2018	Batch ID: <b>42210</b> Analysis Date: <b>12/20/2018</b>	RunNo: <b>56489</b> SeqNo: <b>1889787</b>	Units: % <b>Rec</b>					
	Analysis Date: 12/20/2018			RPDLimit Qual				

#### Qualifiers:

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

Page 5 of 5

HALL ENVIRONMENTAL ANALYSIS LABORATORY				TEL: 505-	Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com					Sample Log-In Check List				
Clier	Client Name: HILCORP ENERGY FAR			Work Order	Work Order Number: 1812988					RcptNo: 1				
Rece	ived By:	Isaiah Ortiz		12/18/2018 8	:05:00 AM	l		en ander	~ (	) Janua				
	pleted By: ewed By:	Michelle Ga		12/18/2018 9	:10:18 AM	l	r.	mii	rel G	pruie)				
	-B _D		8/18											
		ustody complet	te?			Yes		No		Not Present				
		sample deliver				Cour								
<u>Log</u> 3. w		npt made to coo	ol the sample	es?		Yes	V	No						
4. We	ere all samp	oles received a	t a temperat	ure of >0° C to 6.0°	C	Yes	7	No						
5. Sa	imple(s) in j	proper containe	er(s)?			Yes		No						
6. Sut	fficient sam	ple volume for	indicated te	st(s)?		Yes	V	No						
				perly preserved?	,	Yes		No						
8. Wa	as preservat	tive added to b	ottles?			Yes		No	✓	NA 🗌				
9. vo	A vials hav	e zero headspa	ace?			Yes		No		No VOA Vials 🗹				
10. We	ere any san	nple containers	received br	oken?		Yes		No						
		ork match bottle incies on chain				Yes		No		# of preserved bottles checked for pH: (<2 pr=12 unless noted)				
12. Are	matrices c	orrectly identifi	ed on Chain	of Custody?	,	Yes		No		Adjusted?				
13. ls it	t clear what	analyses were	erequested?		•	Yes		No						
		ng times able to ustomer for aut			,	Yes		No		Checked by: DAD 12/18/18				
Speci	al Handli	ing (if appli	cable)											
		tified of all disc		ith this order?		Yes		No						
	By Who Regardi	9 · · · ·			Date Via:	eMa	iil 🗌 Pho	ne 🗌	Fax	In Person				
16. Ad	ditional rer	narks:												
17. <u>Co</u>	oler Infor	mation												
	Cooler No	, ni filo de casto de la fonciencia de filo	Condition	Seal Intact Seal	No Se	al Da	ite Si	gned I	Зу					
1				Yes Yes										
4	•	<u>ح</u> ، ۱		163	1									

	ANALYSIS LABORATORY	l.com	, NM 87109	505-345-4107	est						∧-!	8260B (VO 8270 (Sem Air Bubbles							 dhencmann C itenv. com Ecarroll O itenv. com	
	- YSIS L	www.hallenvironmental.com	- Albuquerque, NM 87109		Analysis		)SԠ	04,	^z ON'	10 ³ Iz	eta 1,IC	M 8 Aମጋମ ),T) snoinA 1808 Pesti							cc: dhenc ecarro	
		www.ha	4901 Hawkins NE	Tel. 505-345-3975		(0)			(1.8 (1.1	209 314	po po	7PH 80155 TPH (Meth 1960) 8031 758) 2'HAT	X			 			 Please	
			490	Te								BTEX + M ⁺ BTEX + M	×			 			 Remarks:	ام
Turn-Around Time:	🕅 Standard 🛛 Rush	Project Name:	OH Randel #5			Project Manager:	Candovar - H	Devis Heacmann - LTE	Sampler: Errc Carroll		Sample temperature: 2, 4 > 2.	Container Preservative HEAL No. Type and # Type   8129 83	1.402 COOI - DOI						 Received by: Date Time F CMM-F-WWL 17/15 1703 Received by: Date Time	1964 Dhue War I - O - carter 12/12/16 ORS
Chain-of-Custody Record	Hilcorp FOUR CORNERS	cardova			970-385-1096	email or Fax#: CC ardova, @ hitcorp. Com		Level 4 (Full Validation)			+	rrix Sample Request ID	1 BH-33 100-105'						Relinquished by:	Chra war
in-of-(	11000	Clara 1	ess:		970 -	#: CCC	ige:				)e) <u>۲</u> // ۲	ne Matrix	10 501				 	 		1964 Q
Cha	Client: $\dot{H}_{i}$	2	Mailing Address:		Phone #:	email or Fax	QA/QC Package:	🗹 Standard	Accreditation			Date	117 1540			 			 Date: Time: 2/11/K [703 Date/ Time:	P1 11/2



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 03, 2019

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

OrderNo.: 1812C56

RE: OH Randel 5

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 6 sample(s) on 12/20/2018 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued December 28, 2018.

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. 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. All samples are reported as received unless otherwise indicated.

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

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** OH Randel 5

Project:

Client Sample ID: BH-32 75-80' Collection Date: 12/18/2018 10:50:00 AM Received Date: 12/20/2018 8:00:00 AM

Lab ID: 1812C56-001	Matrix: SOIL	Re	eceived Date:	12/20/	/2018 8:00:00 AM
Analyses	Result	PQL Q	Qual Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	12/27/2018 7:41:34 PM
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	12/27/2018 7:41:34 PM
Surr: DNOP	95.1	50.6-138	%Rec	1	12/27/2018 7:41:34 PM
EPA METHOD 8015D: GASOLINE RANG	GE				Analyst: NSB
Gasoline Range Organics (GRO)	28	4.9	mg/Kg	1	12/26/2018 10:10:19 PM
Surr: BFB	169	73.8-119	S %Rec	1	12/26/2018 10:10:19 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	0.069	0.025	mg/Kg	1	12/26/2018 10:10:19 PM
Toluene	0.66	0.049	mg/Kg	1	12/26/2018 10:10:19 PM
Ethylbenzene	0.14	0.049	mg/Kg	1	12/26/2018 10:10:19 PM
Xylenes, Total	1.7	0.099	mg/Kg	1	12/26/2018 10:10:19 PM
Surr: 4-Bromofluorobenzene	103	80-120	%Rec	1	12/26/2018 10:10:19 PM

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 9
	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

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** OH Randel 5

Project:

Client Sample ID: BH-32 95-100' Collection Date: 12/18/2018 11:40:00 AM Received Date: 12/20/2018 8:00:00 AM

Lab ID: 1812C56-002	Matrix: SOIL	Re	ceived Date:	12/20	/2018 8:00:00 AM
Analyses	Result	PQL Q	ual Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.9	mg/Kg	1	12/27/2018 8:03:33 PM
Motor Oil Range Organics (MRO)	ND	50	mg/Kg	1	12/27/2018 8:03:33 PM
Surr: DNOP	96.2	50.6-138	%Rec	1	12/27/2018 8:03:33 PM
EPA METHOD 8015D: GASOLINE RANG	θE				Analyst: NSB
Gasoline Range Organics (GRO)	31	4.7	mg/Kg	1	12/26/2018 11:11:34 AM
Surr: BFB	193	73.8-119	S %Rec	1	12/26/2018 11:11:34 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	0.024	0.024	mg/Kg	1	12/26/2018 11:11:34 AM
Toluene	0.048	0.047	mg/Kg	1	12/26/2018 11:11:34 AM
Ethylbenzene	ND	0.047	mg/Kg	1	12/26/2018 11:11:34 AM
Xylenes, Total	0.30	0.094	mg/Kg	1	12/26/2018 11:11:34 AM
Surr: 4-Bromofluorobenzene	103	80-120	%Rec	1	12/26/2018 11:11:34 AM

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 9		
	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		Sample container temperature is out of limit as specifie		

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

OH Randel 5

1812C56-003

**Project:** 

Lab ID:

Analyses

Client Sample ID: BH-31 94-96' Collection Date: 12/19/2018 11:20:00 AM Received Date: 12/20/2018 8:00:00 AM

Matrix: SOIL Result PQL Qual Units DF **Date Analyzed** EPA METHOD 8015M/D: DIESEL RANGE ORGANICS Analyst: Irm Diesel Range Organics (DRO) ND 10 12/27/2018 8:25:26 PM mg/Kg 1

Motor Oil Range Organics (MRO)	ND	50	mg/Kg	1	12/27/2018 8:25:26 PM
Surr: DNOP	96.1	50.6-138	%Rec	1	12/27/2018 8:25:26 PM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	12/26/2018 11:34:13 AM
Surr: BFB	92.4	73.8-119	%Rec	1	12/26/2018 11:34:13 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	12/26/2018 11:34:13 AM
Toluene	ND	0.047	mg/Kg	1	12/26/2018 11:34:13 AM
Ethylbenzene	ND	0.047	mg/Kg	1	12/26/2018 11:34:13 AM
Xylenes, Total	ND	0.094	mg/Kg	1	12/26/2018 11:34:13 AM
Surr: 4-Bromofluorobenzene	96.2	80-120	%Rec	1	12/26/2018 11:34:13 AM

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 3 of 9
	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

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** OH Randel 5

Project:

Client Sample ID: BH-31 61-63' Collection Date: 12/19/2018 11:00:00 AM Received Date: 12/20/2018 8:00:00 AM

Lab ID: 1812C56-004	Matrix: SOIL	Rec	ceived Date:	12/20/	2018 8:00:00 AM
Analyses	Result	PQL Q	ual Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	330	10	mg/Kg	1	12/27/2018 8:47:13 PM
Motor Oil Range Organics (MRO)	ND	50	mg/Kg	1	12/27/2018 8:47:13 PM
Surr: DNOP	106	50.6-138	%Rec	1	12/27/2018 8:47:13 PM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	7200	470	mg/Kg	100	12/26/2018 11:56:55 AM
Surr: BFB	199	73.8-119	S %Rec	100	12/26/2018 11:56:55 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	28	2.3	mg/Kg	100	12/26/2018 11:56:55 AM
Toluene	270	4.7	mg/Kg	100	12/26/2018 11:56:55 AM
Ethylbenzene	28	4.7	mg/Kg	100	12/26/2018 11:56:55 AM
Xylenes, Total	270	9.4	mg/Kg	100	12/26/2018 11:56:55 AM
Surr: 4-Bromofluorobenzene	107	80-120	%Rec	100	12/26/2018 11:56:55 AM

Qualifiers: * Value exceeds Maximum Contaminant		Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method E			
	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 4 of 9		
	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		

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** 

**Project:** OH Randel 5

Client Sample ID: BH-28 45-50' Collection Date: 12/19/2018 12:55:00 PM Received Date: 12/20/2018 8:00:00 AM

Lab ID: 1812C56-005	Matrix: SOIL	Rece	eived Date:	12/20/	/2018 8:00:00 AM
Analyses	Result	PQL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	12/27/2018 9:09:02 PM
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	12/27/2018 9:09:02 PM
Surr: DNOP	99.6	50.6-138	%Rec	1	12/27/2018 9:09:02 PM
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	12/26/2018 12:19:50 PM
Surr: BFB	90.7	73.8-119	%Rec	1	12/26/2018 12:19:50 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	12/26/2018 12:19:50 PM
Toluene	ND	0.048	mg/Kg	1	12/26/2018 12:19:50 PM
Ethylbenzene	ND	0.048	mg/Kg	1	12/26/2018 12:19:50 PM
Xylenes, Total	ND	0.095	mg/Kg	1	12/26/2018 12:19:50 PM
Surr: 4-Bromofluorobenzene	95.6	80-120	%Rec	1	12/26/2018 12:19:50 PM

Qualifiers:	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 5 of 9
	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

## Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** OH Randel 5

Project:

Client Sample ID: BH-28 85-87' Collection Date: 12/19/2018 2:25:00 PM Received Date: 12/20/2018 8:00:00 AM

Lab ID: 1812C56-006	Matrix: SOIL	Rece	ived Date:	12/20/	/2018 8:00:00 AM
Analyses	Result	PQL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: Irm
Diesel Range Organics (DRO)	ND	9.7	mg/Kg	1	12/27/2018 9:30:46 PM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	12/27/2018 9:30:46 PM
Surr: DNOP	109	50.6-138	%Rec	1	12/27/2018 9:30:46 PM
EPA METHOD 8015D: GASOLINE RANG	E				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	12/26/2018 4:30:08 PM
Surr: BFB	89.7	73.8-119	%Rec	1	12/26/2018 4:30:08 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	12/26/2018 4:30:08 PM
Toluene	ND	0.047	mg/Kg	1	12/26/2018 4:30:08 PM
Ethylbenzene	ND	0.047	mg/Kg	1	12/26/2018 4:30:08 PM
Xylenes, Total	ND	0.093	mg/Kg	1	12/26/2018 4:30:08 PM
Surr: 4-Bromofluorobenzene	95.4	80-120	%Rec	1	12/26/2018 4:30:08 PM

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 6 of 9
	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#:	1812C56
	03-Jan-19

Client: Project:	HILCOR OH Rand	P ENERGY el 5	ľ								
Sample ID	LCS-42306	SampTy	pe: LC	s	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	LCSS	Batch	ID: 42	306	F	RunNo: 5	6614				
Prep Date:	12/26/2018	Analysis Da	ate: 12	2/27/2018	S	SeqNo: 1	894477	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range C	Organics (DRO)	51	10	50.00	0	102	70	130			
Surr: DNOP		4.1		5.000		81.6	50.6	138			
Sample ID	MB-42306	SampTy	pe: MI	BLK	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	PBS	Batch	ID: 42	306	F	RunNo: 5	6614				
Prep Date:	12/26/2018	Analysis Da	ate: 12	2/27/2018	S	SeqNo: 1	894478	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range C	Organics (DRO)	ND	10								
Motor Oil Range	e Organics (MRO)	ND	50								
Surr: DNOP		9.3		10.00		93.4	50.6	138			
Sample ID	1812C56-006AMS	SampTy	pe: <b>M</b>	S	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	BH-28 85-87'	Batch	ID: 42	306	F	RunNo: 5	6614				
Prep Date:	12/26/2018	Analysis Da	ate: 12	2/27/2018	S	SeqNo: 1	895081	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range C	Organics (DRO)	51	9.6	48.12	0	106	53.5	126			
Surr: DNOP		5.2		4.812		108	50.6	138			
Sample ID	1812C56-006AMS	<b>)</b> SampTy	pe: <b>M</b>	SD	Tes	tCode: E	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	BH-28 85-87'	Batch	ID: 42	306	F	RunNo: 5	6614				
Prep Date:	12/26/2018	Analysis Da	ate: 12	2/27/2018	5	SeqNo: 1	895082	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range C	Organics (DRO)	50	9.8	48.92	0	102	53.5	126	2.34	21.7	
Surr: DNOP		5.0		4.892		101	50.6	138	0	0	

#### **Qualifiers:**

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical 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 7 of 9

## **QC SUMMARY REPORT** Hall Environmental Analysis Laboratory, Inc.

WO#:	1812C56
	03. Jan. 19

Client: HILCO Project: OH Ran	RP ENERG idel 5	Y								
Sample ID MB-42264	SampT	ype: ME	BLK	Tes	tCode: E	PA Method	8015D: Gaso	oline Rang	e	
Client ID: PBS	Batch	n ID: <b>42</b>	264	F	RunNo: 5	6602				
Prep Date: 12/21/2018	Analysis D	ate: 12	2/26/2018	S	SeqNo: 1	893678	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								
Surr: BFB	950		1000		95.2	73.8	119			
Sample ID LCS-42264	SampT	ype: LC	s	Tes	tCode: E	PA Method	8015D: Gaso	oline Rang	e	
Client ID: LCSS	Batch	n ID: 42	264	F	RunNo: 5	6602				
Prep Date: 12/21/2018	Analysis D	ate: 12	2/26/2018	S	SeqNo: 1	893679	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.2	80.1	123			
Surr: BFB	1100		1000		111	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

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QC SUMMARY REPORT	
Hall Environmental Analysis Laboratory, Inc.	

WO#: 1812C56 03-Jan-19

# Client:HILCORP ENERGYProject:OH Randel 5

Sample ID MB-42264	Samo	Type: ME	RI K	Tes	tCode: <b>F</b> I	PA Method	8021B: Volat	iles		
	•									
Client ID: PBS	Batc	h ID: 42	264	F	RunNo: 5	6602				
Prep Date: 12/21/2018	Analysis I	Date: 12	2/26/2018	S	SeqNo: 1	893709	Units: <b>mg/K</b>	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	1.0		1.000		102	80	120			
Sample ID LCS-42264	Samp	Гуре: <b>LC</b>	s	Tes	tCode: <b>F</b> I	24 Method	8021B: Volat	iloe		
	Camp			100		Amethou		1162		
Client ID: LCSS		h ID: <b>42</b>			RunNo: 5		6021B. Volat	.1165		
Client ID: LCSS Prep Date: 12/21/2018		h ID: 42	264	R		6602	Units: mg/K			
	Batc	h ID: 42	264 2/26/2018	R	RunNo: 5	6602			RPDLimit	Qual
Prep Date: 12/21/2018	Batc Analysis [	h ID: 42 Date: 12	264 2/26/2018	R S	tunNo: <b>5</b> SeqNo: <b>1</b>	6602 893710	Units: mg/K	g	RPDLimit	Qual
Prep Date: 12/21/2018 Analyte	Batc Analysis I Result	h ID: 42 Date: 12 PQL	264 2/26/2018 SPK value	R S SPK Ref Val	RunNo: <b>5</b> SeqNo: <b>1</b> %REC	6602 893710 LowLimit	Units: <b>mg/K</b> HighLimit	g	RPDLimit	Qual
Prep Date: 12/21/2018 Analyte Benzene	Batc Analysis I Result 0.84	h ID: <b>42</b> Date: <b>1</b> 2 PQL 0.025	264 2/26/2018 SPK value 1.000	R S SPK Ref Val 0	RunNo: 5 SeqNo: 1 %REC 84.0	6602 893710 LowLimit 80	Units: <b>mg/K</b> HighLimit 120	g	RPDLimit	Qual
Prep Date: 12/21/2018 Analyte Benzene Toluene	Batc Analysis I Result 0.84 0.90	h ID: 42 Date: 12 PQL 0.025 0.050	264 2/26/2018 SPK value 1.000 1.000	R S SPK Ref Val 0 0	RunNo: 5 SeqNo: 1 %REC 84.0 90.2	6602 893710 LowLimit 80 80	Units: <b>mg/K</b> HighLimit 120 120	g	RPDLimit	Qual

#### Qualifiers:

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

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ANALY	ONMENT (SIS RATORY	AL	TE	ll Environmer 1 L: 505-345-3 Website: www	490 Albuquerq 975 FAX:	1 Hawkins NE ue, NM 87109 505-345-4107	Sa	mple Log-In (	Check List
Client Name:	HILCORP	ENERGY FAI	R Work	Order Numb	ber: 1812	C56		RoptNo	c 1
Received By: Completed By:	Anne Tho	0.0000		018 8:00:00			am A		
Reviewed By:		B 12/2	1/12/21/2	018 8:51:10	AM	U	Lag	5	
Chain of Cust	tody		10						
1. Is Chain of Cu	istody comp	lete?			Yes	~	No 🗌	Not Present	
2. How was the	sample deliv	ered?			Cour	ier			
Log In									
3. Was an attem	pt made to o	cool the samp	les?		Yes	~	No 🗌	NA 🗆	
4. Were all samp	les received	i at a tempera	ture of >0° C	to 6.0°C	Yes	<b>×</b>	No 🗌	NA 🗆	
5. Sample(s) in p	roper conta	iner(s)?			Yes	✓	No 🗌		
6, Sufficient samp	ole volume f	or indicated te	st(s)?		Yes		No 🗌		
7. Are samples (e	except VOA	and ONG) pro	perly preserve	ed?	Yes	~	No 🗆		
8. Was preservat	ive added to	bottles?			Yes		No 🗹	NA 🗆	
9. VOA vials have	e zero heads	space?			Yes		No 🗆	No VOA Vials 🔽	1
10, Were any sam	ple containe	ers received b	roken?		Yes		No 🗹	# of preserved	118
11. Does paperwor (Note discrepa			ř.		Yes	✓	No 🗌	for pH: (<2 o	12 upless noted)
12. Are matrices co	orrectly iden	tified on Chair	of Custody?		Yes	~	No 🗌	Adjusted?	
13, Is it clear what	analyses we	ere requested	?		Yes	~	No 🗌		5
14. Were all holdin (If no, notify cu	-				Yes	~	No 🗆	Checked by	$\checkmark$
Special Handli	ng (if app	licable)							
15. Was client not	ified of all di	screpancies v	with this order?	,	Yes		No 🗌	NA 🔽	
Person M	Notified:			Date:	[]				
By Whor	n:			Via:	eMa	il 🗌 Phon	e 🗌 Fax	In Person	
Regardir	ng:		A laine of a firmer of a						
Client In:	structions:						and and the state of the		
16. Additional rem	narks:								
17. Cooler Inform	nation								
Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Da	te Sig	ned By	1	
1	1.0	Good	Yes						
2	1.0	Good	Yes					-	
3	1.0	Good Good	Yes Yes					-	
r.	1.0	0000	105					L	

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

## Sample Log-In Check List

RcptNo: 1

· <del>-</del>... · . . -

## Client Name: HILCORP ENERGY FAR Work Order Number: 1812C56

Cooler NoTemp °CConditionSeal IntactSeal NoSeal DateSigned By51.0GoodYes61.4GoodYes

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