



**GROUNDWATER MONITORING AND ADDITIONAL DELINEATION REPORT - 2023**

Property:

**Sullivan Gas Com D #1E  
UNIT F S26N T29N R11W  
San Juan County, New Mexico  
Hilcorp Energy Company  
NMOCD Incident Number: NCS1518952648**

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Prepared for:

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## 1.0 INTRODUCTION

On behalf of Hilcorp Energy Company (Hilcorp), Ensolum, LLC (Ensolum) presents this *Groundwater Monitoring and Additional Delineation Report – 2023* to the New Mexico Oil Conservation Division (NMOCD) to document activities conducted between 2021 and 2023 at the Sullivan Gas Com D #1E natural gas production well (Site). The Site is located in Unit F of Section 26 within Township 29 North and Range 11 West in San Juan County, New Mexico (Figure 1). In 2015, the former operator, XTO Energy, Inc. (XTO), discovered historical impacts to soil and groundwater during the replacement of a fiberglass pipeline between the separator and production tank. Hilcorp acquired the production well in August 2017 from XTO and assumed the environmental responsibility for the Site. This report summarizes Site activities conducted by WSP USA, Inc. (WSP) and Ensolum from February 2021 to June 2023, including the latest quarterly groundwater sampling results, additional Site delineation efforts, an analysis of remedial system performance, and recommendations for future course of action.

### 1.1 Initial Release and Site Background

The Sullivan Gas Com D #1E natural gas well was drilled and completed in March 1980 under the operation of Amoco. In January 1998, the operations transitioned to XTO. During facility upgrades on June 1, 2015, XTO encountered suspected petroleum hydrocarbon impacted soil while replacing a fiberglass pipeline between the separator and production tanks. A failed union in the fiberglass pipeline was identified as the source. On June 2, 2015, a grab sample was collected at 6 feet below ground surface (bgs), under the failed union. Analytical laboratory results of the grab sample exceeded the remediation action levels for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and Total Petroleum Hydrocarbons (TPH) as defined by the 1993 NMOCD *Guidelines for Remediation of Leaks, Spills and Releases*. Based on estimated depth to groundwater of less than 50 feet bgs, distance to a water well greater than 1,000 feet, and distance to surface water greater than 1,000 feet, the Site was ranked a 20 following the NMOCD Guidelines. An initial Form C-141 was submitted to the NMOCD on June 19, 2015.

### 1.2 Initial Site Investigations and Remediation Actions

Site investigations began in 2015 following the identification of petroleum impacts. A total of 14 hand auger borings and 9 direct-push soil borings were advanced in an attempt to delineate and characterize the petroleum hydrocarbon impacts to soil and groundwater. A summary report of the results and an initial remediation work plan were submitted to the NMOCD in September 2015.

In October 2015, XTO conducted additional Site characterization activities to assess impacts to groundwater and monitor groundwater quality. During this investigation six monitoring wells (MW01 through MW06) and one product recovery well (PR-1) were installed. Of the seven wells installed, product recovery well PR-1 and monitoring wells MW-1, MW-2, MW-5, and MW-6 contained phase-separated hydrocarbons (PSH, commonly referred to as “free product”) in contact with groundwater. Monitoring wells MW-3 and MW-4 did not contain measurable PSH; however, laboratory analysis identified BTEX impacts to groundwater.

XTO began active and passive PSH recovery via vacuum trucks and oil-absorbent socks. By November 2015, a total volume of approximately 28 barrels (bbls) of petroleum hydrocarbon impacted groundwater and PSH were recovered. In addition, XTO performed a Soil Vapor Extraction (SVE) pilot test to evaluate the effectiveness of implementing in-situ remediation to address vadose zone soil in the source area of the Site. Following the additional delineation and SVE pilot testing, XTO submitted an updated *Remediation Work Plan* and Form C-141 in November 2015, which was subsequently approved by the NMOCD. In April 2016, XTO installed a limited SVE system based on favorable geology and successful initial SVE testing. The SVE system was designed to target the source area using existing monitoring wells MW-01, MW-02, MW-05, and MW-06 and product recovery well PR-1. The system was initially powered by an



electric single-phase, 3-horsepower regenerative blower capable of approximately 100 cubic feet per minute (CFM) of flow and an applied vacuum of 50 inches of water column (IWC). The Radius of Influence (ROI) on each SVE well was estimated to be approximately 40 feet. A PSH recovery tank was installed on the system to capture accumulated liquids while extracting soil vapors. Based on the volumes and concentrations of the initial air samples in April 2016, XTO filed a Notice of Intent with the New Mexico Environment Department – Air Quality Bureau in anticipation of potential emissions exceeding 10 tons per year of regulated contaminants. XTO completed regular operations and maintenance (O&M) on the SVE system and conducted quarterly groundwater monitoring including depth to groundwater and PSH thickness. PSH in monitoring wells was manually recovered with a disposable bailer during the quarterly sampling events.

Upon receipt of a letter from the NMOCD in June 2017 requesting additional delineation and remediation activities, XTO submitted a *Continued Remediation Plan* in August 2017. This plan proposed continued SVE system operations, semi-annual groundwater monitoring events, and additional delineation of existing petroleum hydrocarbon impacts to groundwater. Based on this submitted plan, XTO conducted an additional Site investigation in October 2017 with a hollow-stem auger drill rig to further delineate petroleum hydrocarbon impacts to soil and groundwater. Six additional monitoring wells (MW-07 through MW-12) and one potential product/total fluids recovery well (PR-2) were installed to monitor petroleum hydrocarbon impacts to groundwater. The results of the October 2017 investigation were documented in the *2017 Annual Groundwater Report* and submitted to the NMOCD in March 2018. Quarterly groundwater sampling and PSH recovery via manual bailing continued between 2017 and 2020, with results summarized in annual reports submitted to the NMOCD. Annual reports were not submitted to the NMOCD for groundwater sampling conducted in 2021 or 2022.

Additionally, on September 5, 2018, the SVE system was shut down due to failure of the blower motor. During the period that the SVE system was shutdown, Hilcorp installed a product skimmer in well MW-5 that was rotated between wells PR-1, MW-8, and MW-12. On December 2, 2021, a rental SVE system was installed at the Site and the SVE system returned to operational status until a new blower motor could be purchased for the original system. The blower motor from the original system was replaced on March 21, 2022, and the system has remained in service since.

## 2.0 ADDITIONAL SITE INVESTIGATION ACTIVITIES

Based on the soil results and groundwater results previously collected at the Site, the impacts remained undelineated to the west of the release area. Additional delineation activities performed at the Site between 2021 and 2023 are further described below.

### 2.1 2021 Delineation Activities

In September and October of 2021, Hilcorp utilized a sonic drilling rig to delineate impacts to soil and groundwater at the Site. During these events, 11 monitoring wells (MW-13 through MW-23) were installed and three dry borings (SB-17 through SB-19) were advanced at the Site (Figure 2). During the 2021 drilling events, borings were advanced to depths up to 40 feet bgs. During drilling, a WSP geologist logged lithology, inspected the soil for petroleum hydrocarbon staining and odors, and field screened using a calibrated photoionization detector (PID), with results noted on the boring logs.

Subsurface lithology generally consisted of silty sand grading to sand and silty sand with increased proportions of gravel and cobbles. Thin, interbedded layers of clay were present at varying depths in many of the borings. This lithology is consistent with river terrace deposits associated with the San Juan River. The unconsolidated soils were underlain in all borings advanced at the Site by the Nacimiento Formation (Stone et al., 1983) consisting of dry, grey claystone/siltstone. Depth to bedrock varies at the Site between 23 feet bgs in the east and south portions of the Site to 40 feet bgs in the western part of the Site. Where present, groundwater was encountered within the unconsolidated sediment and perched directly on top of the dense claystone/siltstone bedrock of the Nacimiento Formation. Groundwater is present at depths ranging from 23 feet to 36 feet bgs at the Site.

Borings SB-17 through SB-19 were advanced along the southern portion of the Site and encountered thicker layers of dry, unconsolidated clay and clayey sands at shallower depths with no apparent saturated zones above the Nacimiento bedrock unit. These borings were left open for 72 hours to assess if groundwater would accumulate into the open borings. After this time, the borings were plugged and no wells were installed. All other borings encountered very moist to saturated soils during drilling, generally within the sand, gravel, and cobble, and were completed as permanent groundwater monitoring wells MW-13 through MW-23.

Soil samples were collected into laboratory provided containers and immediately placed on ice for preservation. Samples were submitted under strict chain-of-custody protocol to Hall Environmental Analysis Laboratory (Hall) for laboratory analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021, TPH as gasoline range organics (GRO), diesel range organics (DRO), and motor-oil range organics (MRO) by EPA Method 8015M/D. Additionally, several soil samples were analyzed for chloride via EPA Method 300.0 to characterize chloride concentrations at the Site. Soil sample results from this event indicated the vertical and lateral extent of impacts were delineated along the southern margin of the Site well pad based on borings SB-17 and SB-18. Additionally, vertical delineation was achieved at all boring/well locations advanced at the Site as indicated by the results from soil sample results collected at the terminus of each boring/well; however, soil sample results indicated TPH and/or BTEX concentrations exceeded the NMOCD Closure Criteria in borings MW-13, MW-14, MW-15, MW-19, MW-20, and MW-23.

Soil analytical results are summarized in Table 1 and on Figure 2, with complete laboratory analytical reports attached as Appendix A. Soil boring logs and monitoring well construction diagrams are included as Appendix B.

## 2.2 2023 Delineation Activities

Based on results from the 2021 drilling events, additional wells were required to the west and northwest of the Site in order to further delineate saturated soil and groundwater impacts. Prior to conducting additional work, a right-of-way (ROW) grant application was submitted to the United State Bureau of Land Management (BLM) in order to drill additional off-lease groundwater monitoring wells. In addition to the application, a cultural resources survey and threatened and endangered species survey were also required in the proposed drilling areas.

Once the application was approved, Ensolum conducted additional delineation efforts at the Site in April 2023. Five additional borings (BH-24 through BH-28, synonymous with well numbers MW-24 through MW-28) were advanced utilizing a sonic drill rig operated by Cascade Environmental. Borings were drilled until reaching the Nacimiento Formation, identified by the dense, blue-gray claystone/siltstone formation, which was encountered at depths ranging from 38 feet to 45 feet bgs. During drilling, an Ensolum geologist logged lithology and field screened soil in the manner described above. Soil composition encountered in borings BH-24 through BH-28 was generally consistent with previous advanced borings and consisted of light brown to grayish poorly graded sand with varying proportions of clay and silt and occasional gravel overlying moist, dense blue-gray clay. All borings were completed as permanent groundwater monitoring wells MW-24 through MW-28.

Soil samples were collected in the manner described above and submitted to Hall for laboratory analysis of BTEX, TPH-GRO, TPH-DRO, and TPH-MRO. Based on soil and groundwater analytical results, impacts at the Site have been delineated to the north at BH-26, BH-27, and BH-28. However, BTEX and TPH concentrations in soil from BH-24 exceeded the NMOCD Table I Closure Criteria for soil in the sample collected between a depth of 30 feet and 35 feet (within the saturated zone). Additionally, PSH is present on the groundwater in well MW-24 (BH-24) and BTEX concentrations in groundwater exceed New Mexico Water Quality Control Commission (NMWQCC) standards in well MW-25 (BH-25). Based on these results, petroleum hydrocarbon impacts remain undelineated to the west and southwest of the Site. Soil analytical results from the 2023 drilling event are also summarized in Table 1 and on Figure 2, with complete laboratory analytical reports attached as Appendix A. Soil boring logs and monitoring well construction diagrams are included in Appendix B.

## 2.3 Well Construction Information

Where groundwater was encountered during drilling, permanent groundwater monitoring wells were installed in the open boring. Wells were constructed with 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 2-inch Schedule 40 PVC 0.010-inch slotted screen. Wells were completed with 10-20 silica sand pack to two feet above the screened interval, then 2 feet of hydrated bentonite seal, and then bentonite-cement slurry grout to ground surface. The wells were completed above ground with a locking, steel protective casing cemented into the ground. Monitoring well construction is described in Table 2.

After construction, Ensolum surveyed the new groundwater monitoring wells with a Trimble® GeoExplorer® 3000 series Global Positioning System (GPS) to determine the latitude and longitude of each location. Top-of-casing elevations were surveyed using a Dewalt® DW074 Rotary Laser Level to an accuracy of ( $\pm$ ) 0.01 feet so that groundwater flow direction and relative groundwater elevation could be determined. Once the top of well casing was surveyed, the depth to groundwater below top of casing was measured with an oil/water interface probe. The wells were developed by purging a minimum of ten casing volumes, or until the well was purged dry.

### 3.0 GROUNDWATER MONITORING

Groundwater monitoring activities were generally conducted on a quarterly basis between 2021 and 2023 (with the exception of the second quarter of 2022) and include Site-wide fluid level measurements, PSH recovery, and analytical groundwater sampling. Results from these sampling events are further described below.

#### 3.1 Fluid Level Measurements

Prior to purging and sampling, static depth to groundwater and total depth of each monitoring well was measured using a Keck® oil/water interface probe. Depth to PSH was also recorded when present and a correction factor of 0.7996 was applied to the elevation to account for the depression of the water column caused by the presence of overlying PSH. The interface probe was decontaminated with Alconox™ soap and rinsed with distilled water prior to each measurement to prevent cross contamination. Depth to groundwater and groundwater elevations are summarized in Table 3.

#### 3.2 Interpretation of Groundwater Flow

Groundwater elevations measured during the quarterly monitoring events were plotted as a hydrograph of groundwater elevation versus time. Hydrographs are time-series plots constructed to provide information about seasonal groundwater elevations, as well as long-term patterns (Figure 3). Sitewide, groundwater elevations indicate a similar trend across the monitoring well network, with seasonal highs on average in March through June and seasonal lows on average in September through December. During the seasonal low period from September through December, several wells, including MW-01, MW-02, MW-03, MW-04, MW-09, and MW-22 have been dry because the water table dropped below the screened interval. Between 2015 and 2022, groundwater elevations sitewide have been generally decreasing. Though, since September 2022, there has been an overall increase in groundwater elevation at most of the wells.

The groundwater elevation at two wells within the monitoring network deviates from the typical trends observed. Specifically, MW-01 has exhibited minimal fluctuation since installation and has been dry during several gauging events with no groundwater or PSH. The groundwater elevation recorded at MW-22 has been consistently and significantly lower than the rest of the network since installation. Because of this deviation, Ensolum resurveyed the top of casing elevation at MW-22 and confirmed the calculated groundwater elevations. MW-22 also has been dry during gauging events in December 2021 and September 2022.

Potentiometric surface maps were drafted with groundwater elevations and PSH thickness measured during the 2022 and 2023 quarterly monitoring events (Figure 4 through Figure 8). Potentiometric contours were generated using kriging interpolation, and product thickness was inferred by considering Site observations and physical characteristics such as topography and groundwater flow direction. Typically, groundwater at the Site flows in a west-northwest direction towards the San Juan River, with a hydraulic gradient of 0.004 feet per foot; however, an observable groundwater depression at MW-22 suggests the groundwater flow direction may turn towards the south in that area.

#### 3.3 Groundwater Sampling Activities

Groundwater samples were collected for laboratory analysis from monitoring wells containing sufficient water to sample and that did not contain measurable PSH. Disposable PVC bailers were used to collect groundwater samples due to limited water volume within several of the monitoring wells. Prior to collecting groundwater samples, WSP/Ensolum determined the casing water volume and purged a minimum of three casing volumes or until the well was bailed dry to ensure water from the adjacent formation, representative of actual aquifer conditions, was sampled. If a

well was purged dry, the well was allowed to recharge before samples were collected. Water quality parameters including pH, electrical conductivity, and temperature were measured in each well using a multi-probe water quality field meter during purging. Groundwater samples were collected into laboratory provided sample bottles and immediately placed on ice for preservation. Samples were submitted under strict chain-of-custody protocol to Hall in Albuquerque, New Mexico for analysis of BTEX.

### 3.4 Groundwater Sampling Results

Based on the analytical results collected between 2021 and 2023, one or more BTEX constituents have been detected at concentrations exceeding NMWQCC standards in wells PR-1, PR-2, MW-02, MW-05, MW-06, MW-08, MW-12, MW-13, MW-15, MW-18, MW-19, MW-22, and MW-25. In general, BTEX concentrations in all wells with NMWQCC exceedances have decreased since sampling commenced in 2015. For example, the highest benzene concentrations detected between 2015 and 2023 was 6,800 micrograms per liter ( $\mu\text{g/L}$ ) from well MW-03, collected on September 14, 2015. In contrast, the highest benzene concentration between 2021 and 2023 was 1,900  $\mu\text{g/L}$  from well MW-18 (October 6, 2022) and the highest concentration from the most current sampling event (May 9, 2023) was 56  $\mu\text{g/L}$ . Groundwater analytical results from the 2022 and 2023 sampling events are also summarized in Figure 4 through 9.

Additionally, measurable PSH has been present in wells PR-1, PR-2, MW-02, MW-05, MW-06, MW-08, MW-12, MW-13, MW-14, MW-15, MW-18, MW-19, MW-20, MW-23, and MW-24 between 2021 and 2023. PSH thickness in all wells has also decreased over time (Figure 10). For example, the maximum thickness of PSH recorded at the Site between 2015 and 2023 was in well MW-14 on September 23, 2021, with a thickness of 4.04 feet. As of the most current sampling event conducted on May 9, 2023, the maximum thickness of PSH was recorded at 0.03 feet from well MW-08.

Groundwater analytical results collected between 2015 and 2023 are summarized on Table 4, with complete laboratory reports from sampling events between 2021 and 2023 included as Appendix C. A graph of dissolved phase total BTEX for several Site wells is presented on Figure 11.



## 4.0 DISCUSSION AND CONCLUSIONS

The following subsections present a discussion of soil and groundwater conditions at the Site based on the recent subsurface investigations conducted in 2021 and 2023, the historical investigations performed between 2015 and 2017, and groundwater monitoring and sampling conducted between 2015 and 2023.

### 4.1 Soil

Petroleum hydrocarbon impacted soil has been delineated to the north, east, and south of the release and appears to be constrained to a west-trending plume extending away from the well pad and across Sullivan Road. Impacts south of the release near the well pad have been previously delineated by WSP in a series of soil borings (SB-17 and SB-18). Based on current and historical soil analytical results, impacts in soil remain present at the Site, predominantly constrained to the saturated zone and smear zone between depths of 20 feet and 35 feet bgs. All Closure Criteria exceedances were at depth intervals either within the saturated zone or smear zone between depths of 20 feet and 35 feet bgs, indicating TPH impacts have migrated hydraulically downgradient at the Site. Soil within the vadose zone (above the saturated/smear zones) in the west portion of the Site are not impacted.

Remediation activities to address source area impacts in the vadose zone soils have been conducted through the implementation of SVE at product recovery well PR-1 and monitoring wells MW-1, MW-2, MW-5, and MW-6. BTEX and TPH analytical results from emissions samples collected from the SVE system indicate a reduction in vadose zone impacts over time (Table 5), although, downgradient soil impacts have not been delineated west and southwest of MW-22 and MW-24 and will require additional investigation. Mobilization of a sonic drill rig will be required to drill off-pad in the vicinity of MW-22 and MW-24 to fully characterize the extent of impacts.

### 4.2 Groundwater

Annual fluctuation of groundwater elevation at the Site appears to be in response to seasonal variations of precipitation infiltrations altering the water table volume, with the lowest elevation observed during the dry fall and winter months and the highest elevation during the spring and summer months. Overall, groundwater elevation has been decreasing since monitoring began in 2015, with several monitoring wells consistently having insufficient water to sample or gauge. Though, since 2022, groundwater elevations have increased at most wells across the Site.

The observed PSH impacts appear to be in contact with groundwater; however, the overall product thickness has decreased due to physical removal by pump and/or bailing, remediation of source zone soils through the SVE system, and likely natural source-zone depletion (the collective, naturally occurring processes of dissolution, volatilization, and biodegradation that result in mass losses and reductions in PSH). The variations in PSH thickness suggest seasonal fluctuations in groundwater elevations continue to be a dominant factor affecting PSH thickness at the Site. When groundwater elevations are at their highest after spring snow melt and summer monsoons, there appears to be a general increase in PSH thickness as groundwater contacts residual hydrocarbons in the overlying smear zone.

Laboratory analytical results from the May 2023 groundwater sampling event indicate the presence of BTEX and/or PSH above NMWQCC standards in wells PR-1, PR-2, MW-05, MW-06, MW-08, MW-12, MW-13, MW-14, MW-15, MW-18, MW-19, MW-20, MW-22, MW-23, MW-24, and MW-25. Concentrations of BTEX in groundwater have been decreasing since monitoring

began in 2015. The full lateral extent of the impacts to groundwater is currently not fully delineated to the west near monitoring wells MW-22 and MW-24. As such, additional monitoring wells west and south of MW-22 will be required to further delineate petroleum hydrocarbon impacts at the Site.

## 5.0 RECOMMENDATIONS

Based on the above discussion, Ensolum recommends the following remedial actions.

### 5.1 Dual Phase Extraction Pilot Test

Based on the success of the SVE system and physical removal of PSH, and with consideration of the nature and extent of the release and favorable Site lithology/geology, Ensolum recommends the use of Dual Phase Extraction (DPE) to recover PSH and remediate soil and groundwater at the Site. As described by the EPA, DPE is an *in-situ* technology used to remove “various combinations of contaminated groundwater, separate-phase petroleum product, and hydrocarbon vapor from the subsurface.” The goal of DPE, in addition to recovering PSH, is to drawdown the groundwater table in order to expose submerged soil impacts and allow for the removal of volatile organic compounds (VOCs) and some semi-volatile organic compounds (SVOCs) from vadose zone soil through the application of vacuum to the subsurface. When air is removed from the soil, contaminants are volatilized and also removed. Depending on contaminant concentrations in the removed air, the DPE system may emit the exhaust directly to the atmosphere.

Ensolum recommends performing a DPE pilot test to evaluate the effectiveness of DPE for the Site prior to full-scale implementation and, if applicable, assess the Site-specific flow and vacuum rates required to volatilize and remove contaminants from the impacted subsurface. Data collected during DPE pilot testing will be used to estimate the system's ROI for both drawdown and vacuum as well as the vacuum radius-of-effect (ROE) to determine well spacing and the need for additional DPE wells at the Site. Additionally, pilot test data can be used to appropriately size a holding tank for PSH and impacted groundwater that is extracted from the subsurface during DPE activities, as well as calculate air effluent concentrations over time.

During pilot testing, wells PR-2 and MW-20 will be used as extraction wells due to their locations within the PSH plume and the varying distances from other, nearby monitoring wells that can be used as observation wells for ROI/ROE data collection. These wells will also be used to test different areas of the Site and assess if DPE is feasible. Existing monitoring wells will be used as observation wells, as specified below. These observation wells have been chosen to provide varying distances from the point of extraction as well as varying well construction and screen intervals. A summary of which wells will be used for observation during each test, along with construction details and distances from the test wells, is provided below.

#### PR-2 Pilot Test

Well ID	Distance from Well PR-2 (feet)	Screened Interval (feet bgs)
PR-2	--	15 – 30
PR-1	45	11.5 – 26.5
MW-01	66	12 – 23
MW-02	26	12 – 23
MW-03	31	12 – 23
MW-04	72	12 – 23
MW-05	46	15 – 30
MW-06	83	17 – 27



**MW-20 Pilot Test**

Well ID	Distance from Well MW-20 (feet)	Screened Interval (feet bgs)
MW-20	--	20 – 35
MW-21	65	19 – 34
MW-22	70	20 – 35
MW-23	45	20 – 35

A vacuum truck will be used to perform the DPE pilot test. An adjustable 1-inch PVC stinger will be installed in the test well allowing the inlet to be adjusted as the water level in the well changes during the dewatering process. The stinger will be connected to the vacuum truck. The well will be sealed off to the atmosphere and vacuum will be applied for the duration of the test. An adjustable manifold will be used to incrementally increase the vacuum being applied to the extraction well in order to determine the minimum vacuum required to air lift the groundwater and PSH from within the well casing.

Once adequate vacuum is applied and the stinger tube is at the bottom of the well, the full screen interval will be exposed and soil vapor flow will be maximized. The vapor-liquid mixture will enter a knockout drum where the liquid drops out into the drum and the vapor is discharged to the atmosphere. Gradations on the knockout drum will allow technicians to record total water recovered over time and calculate groundwater extraction rates. When the knockout drum is full, the groundwater and PSH mixture will be extracted into the vacuum truck. All liquids extracted during the event will be containerized within the vacuum truck and will be transported off-Site to an approved disposal facility. All vapors recovered will be emitted to the atmosphere.

System parameters, such as vacuum on the truck, vacuum on the well head, vapor extraction flow rate, vapor hydrocarbon concentration as measured by a PID, vapor lower explosive limit (LEL), vapor oxygen concentration, and vapor carbon dioxide concentration will be collected at 15- to 30-minute intervals during the event. The final data collection interval will be dependent upon noted changes in field observations. Prior to initiating the testing event, Ensolum will collect depth to water and wellhead vacuum readings from surrounding observation wells. These readings will be considered the static conditions. Depth to groundwater and wellhead pressures will be collected from the same observation wells at 15- to 30-minute intervals and compared to the static conditions to determine if there is any measurable influence from the applied vacuum and extraction of fluids from the DPE extraction well. Accumulated groundwater and PSH volumes as observed from knockout drum gradations will also be recorded. The vacuum truck will be gauged following testing activities to determine the total volume of fluids recovered and the estimated volume of PSH recovered.

A vapor sample will be collected after 30 minutes of testing and at the end of the test, prior to vacuum truck shutdown. Additional vapor samples may be collected if increased PID results are observed during the testing. Vapor samples will be collected in 1-liter Tedlar® bags and will be submitted to Hall for analysis of BTEX and total volatile petroleum hydrocarbons (TVPH) by EPA Method 8260.

**5.1.1 Pilot Test Goals**

The goal of the testing will be to collect data to verify the feasibility of effectively recovering PSH, depressing the groundwater table, and allowing for vapor recovery from the soil intervals with the greatest impacts. Feasibility of DPE at the Site will depend upon the groundwater extraction flow

rate, calculated ROI/ROE, and mass removal observed during the testing. After completion of the DPE pilot test, Ensolum will prepare a Pilot Test Report summarizing the results of the test and recommendations for the design and construction of the full-scale DPE system, if warranted. The report will include the calculations for ROI and ROE, system specifications required to remediate subsurface impacts, and an operation and maintenance plan for the system and the proposed remediation schedule and timeline.

Alternatively, if the pilot test demonstrates that DPE is not viable at the Site, an Updated Remediation Work Plan proposing alternative recommendations for remedial actions will be prepared and submitted to the BLM and NMOCD.

### 5.2 Additional Drilling and Sampling

Ensolum proposes the DPE pilot test is conducted prior to additional delineation near MW-22 and MW-24. The pilot test will identify the idealized well spacing to optimize the DPE system. Once the ROI from the DPE pilot test is determined, a minimum of three borings are proposed west and south of wells MW-22 and MW-24. Precise distances for the borings will be determined based on the DPE pilot test results. These borings are proposed to be off-pad and will require removal of vegetation for access. Removal of vegetation for boring access will be performed after approval from the landowner and in accordance with all regulations and best management practices.

Based on the calculated ROI for the DPE system, additional borings may also be needed at the Site in between existing wells in order to induce subsurface influence in all impacted areas. Additional borings will be assessed after the DPE pilot test results are prepared. A subsequent report will be submitted to the NMOCD summarizing the results and data from the additional drilling and delineation activities.

### 5.3 Continued Quarterly Monitoring

Hilcorp will continue quarterly groundwater monitoring and sampling in all accessible monitoring wells and product recovery wells. Regular monitoring will be critical to assess the effectiveness of SVE and proposed DPE system and will help determine whether further actions are needed.

## 6.0 IMPLEMENTATION SCHEDULE

The following schedule will be implemented for work at the Site, with day 0 beginning on the date this report is approved by the NMOCD.

- Hilcorp and Ensolum will perform the DPE pilot test and prepare the *Pilot Test Report* within 90 days.
- Additional drilling and delineation activities will commence within 90 days of submittal of the *Pilot Test Report*, pending driller availability, weather conditions, and Site access.
- The NMOCD will be notified of any deviations from the above schedule.

## 7.0 REFERENCES

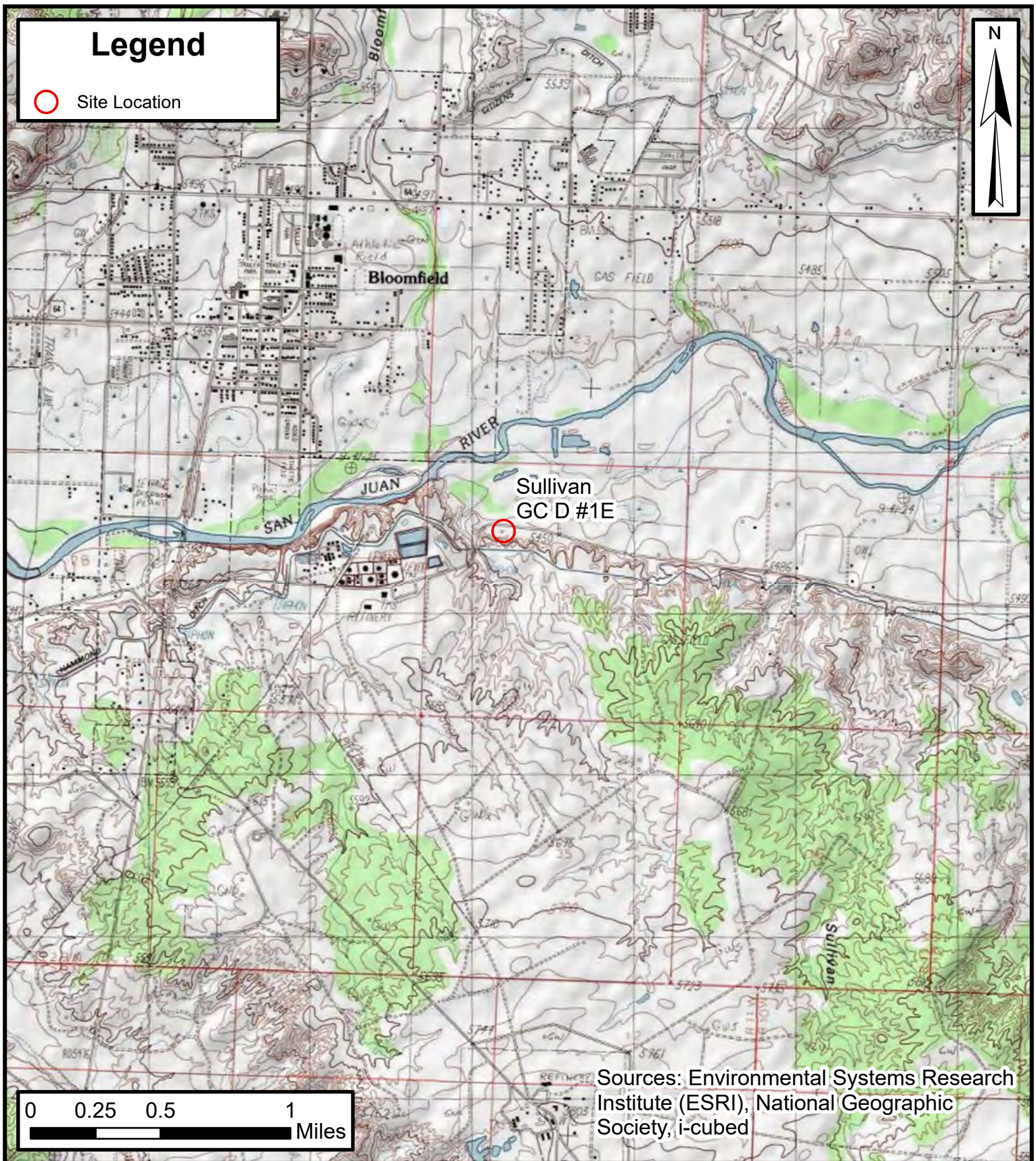
Agency, U. S. (2017). How to Evaluate Alternative Cleanup Technologies For Underground Storage Tank Sites: A Guide For Corrective Action Plan Reviewers. *Environmental Protection Agency PA 510-B-17-003*, XI-1.

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



Figures





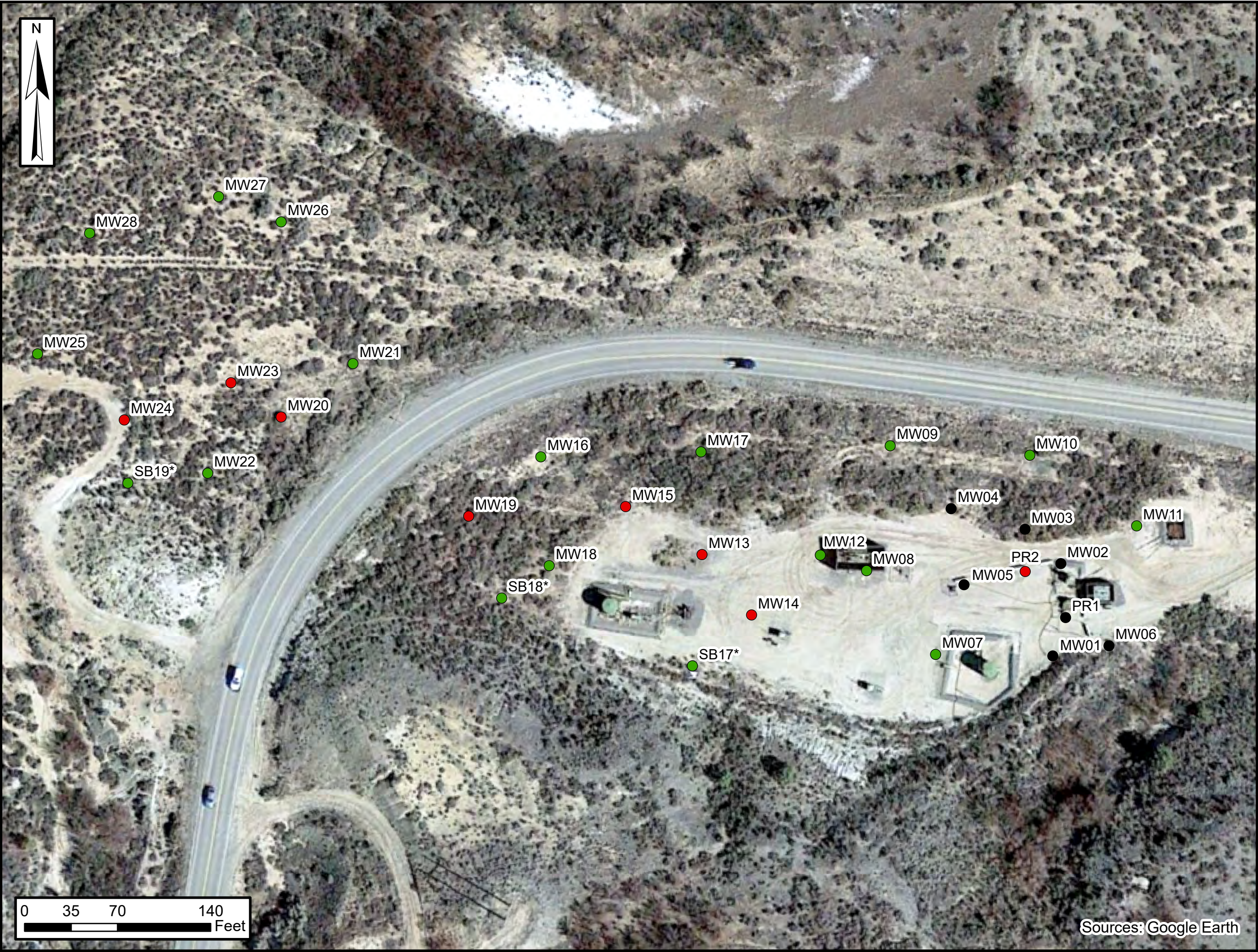
## Site Location Map

Sullivan GC D #1E  
 Hilcorp Energy Company  
 36.7001, -107.9649  
 San Juan County, New Mexico

**FIGURE**  
**1**

**ENSOLUM**  
 Environmental, Engineering and  
 Hydrogeologic Consultants





### Legend

- Soil Samples in Compliance with NMOCD Closure Criteria
- Soil Samples Exceeding NMOCD Closure Criteria
- No Soil Data

Notes:

\* Indicates Dry Boring

### Soil Analytical Results

Sullivan GC D #1E  
Hilcorp Energy Company

36.7001, -107.9649  
San Juan County, New Mexico

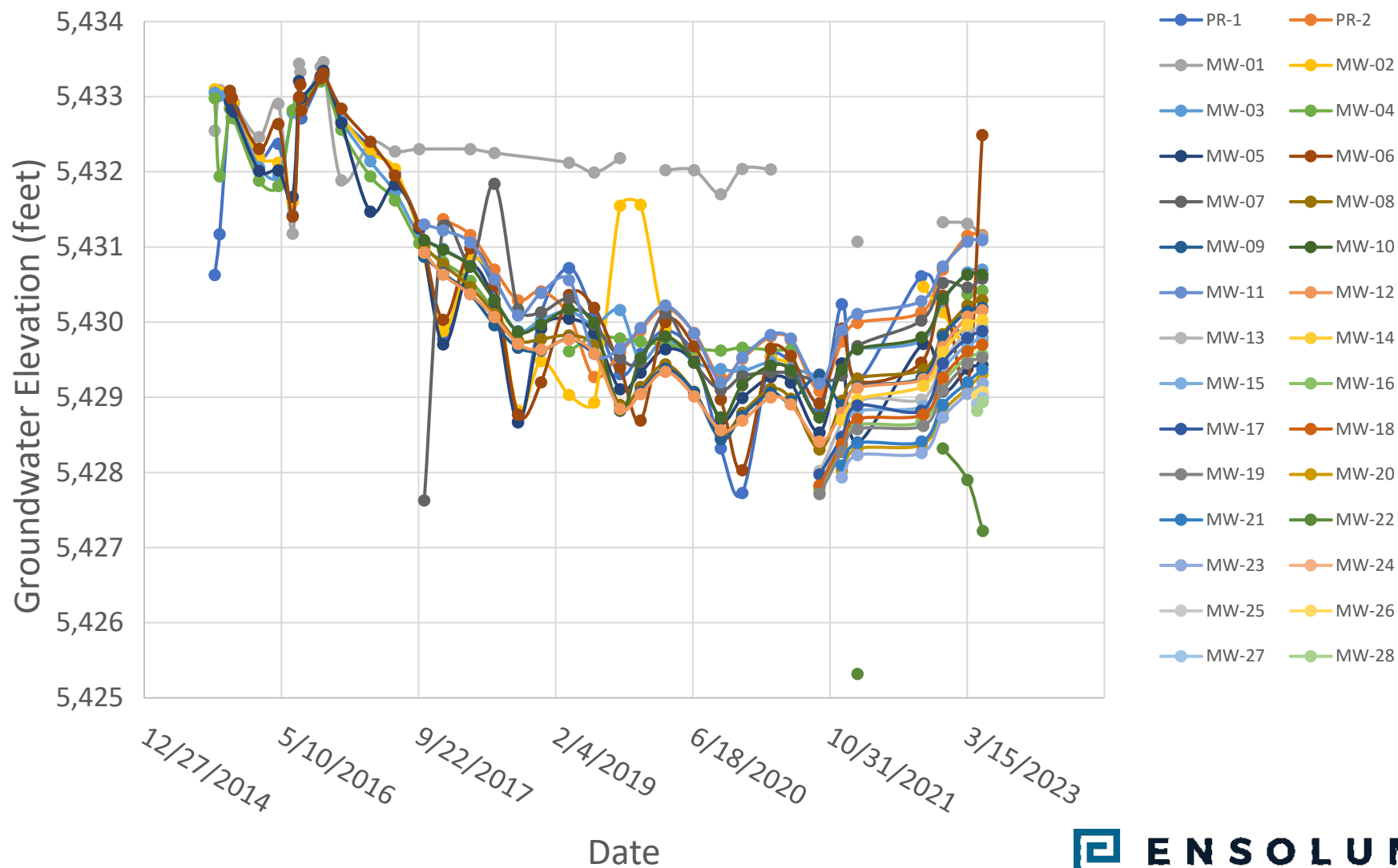
Figure 2



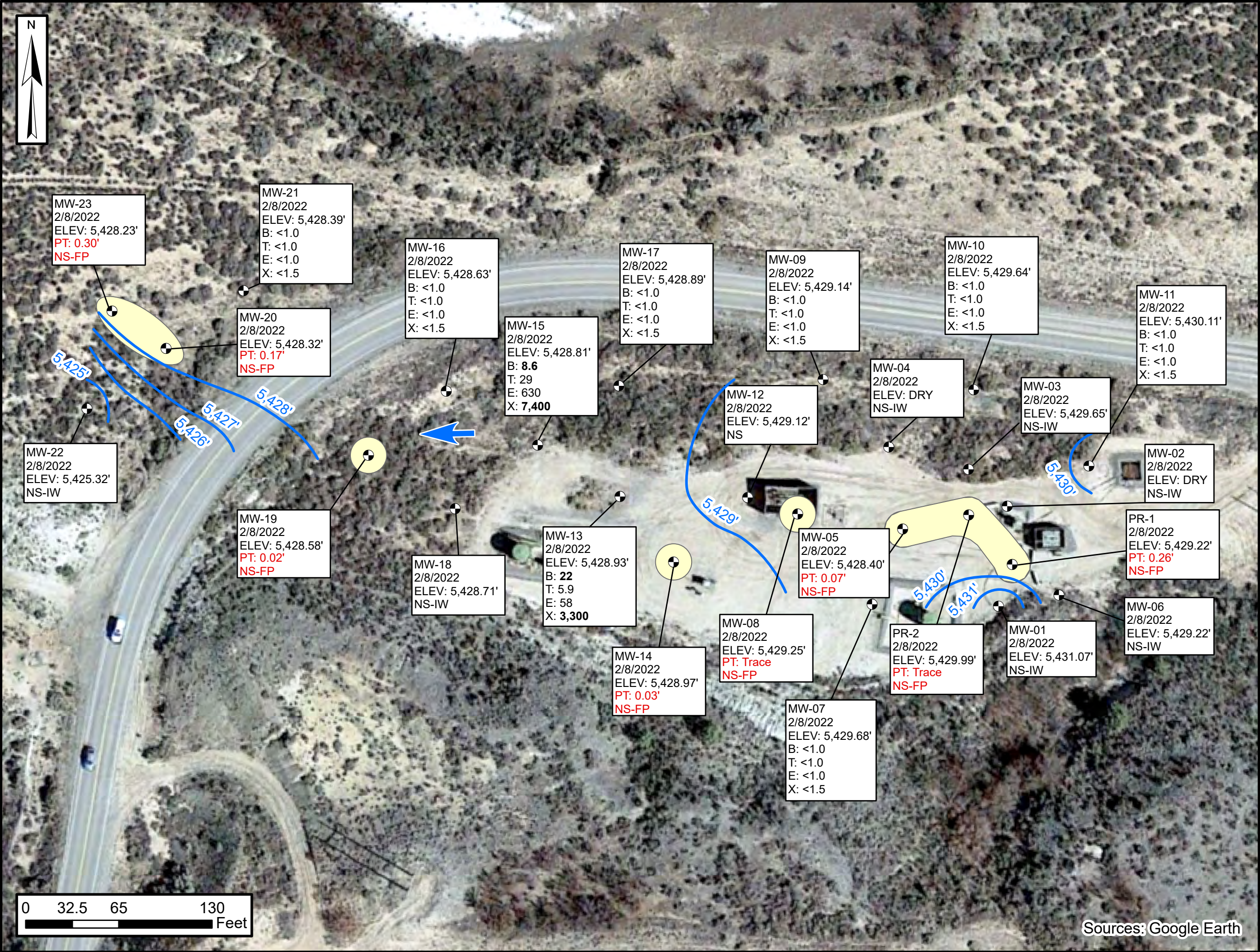
Environmental, Engineering and Hydrogeologic Consultants



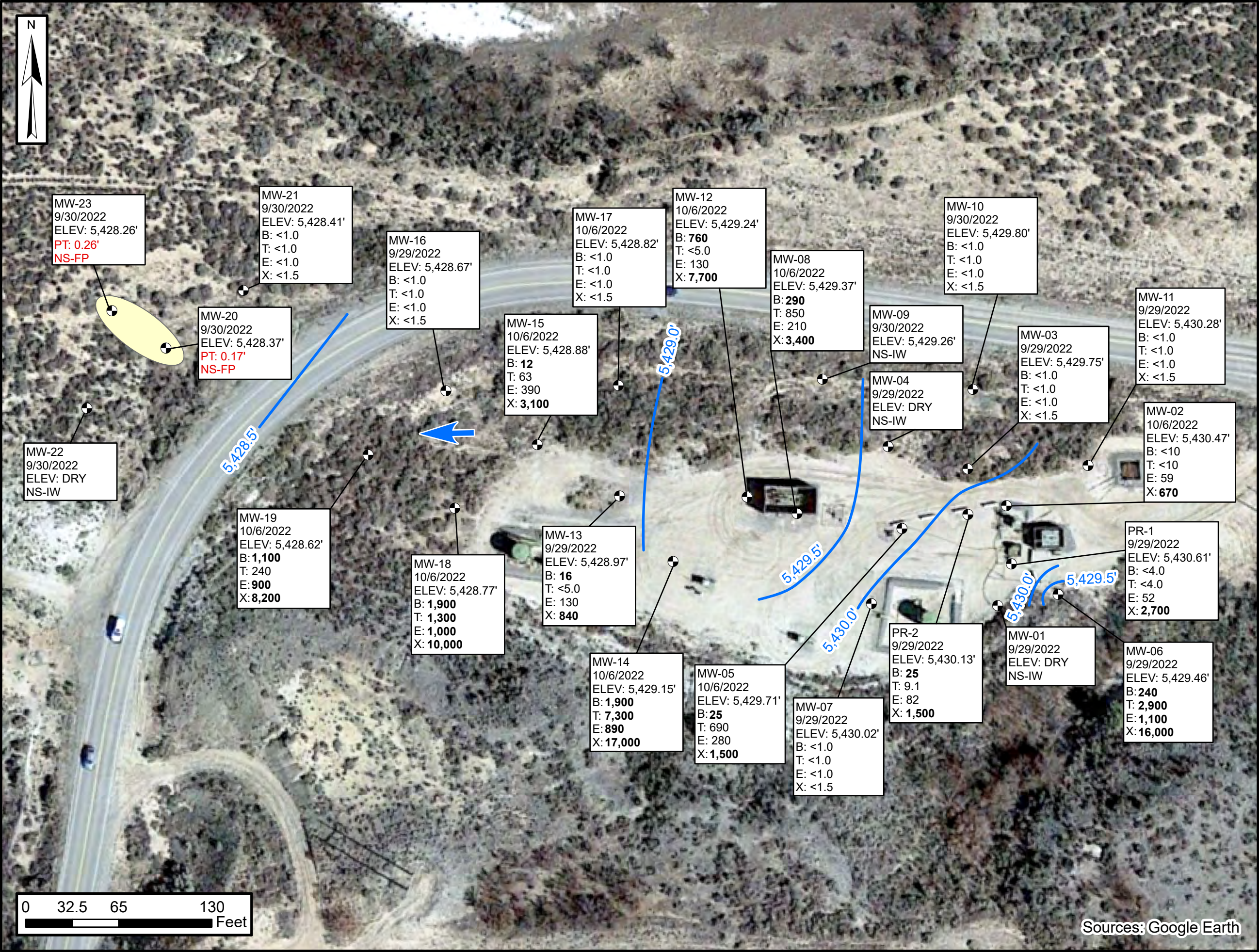
**Figure 3**  
**Groundwater Elevation Hydrograph**  
**Sullivan Gas Com D #1E**



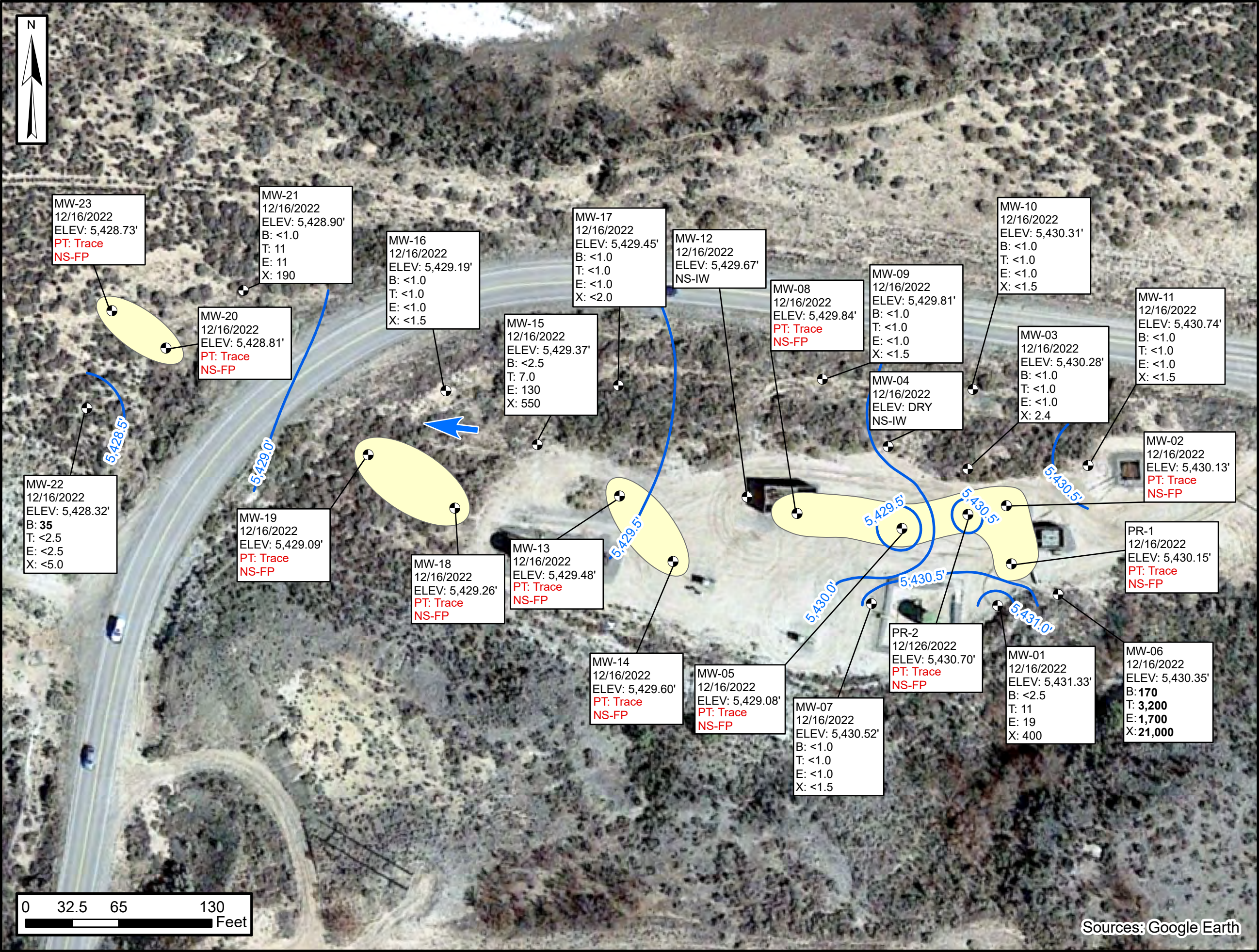




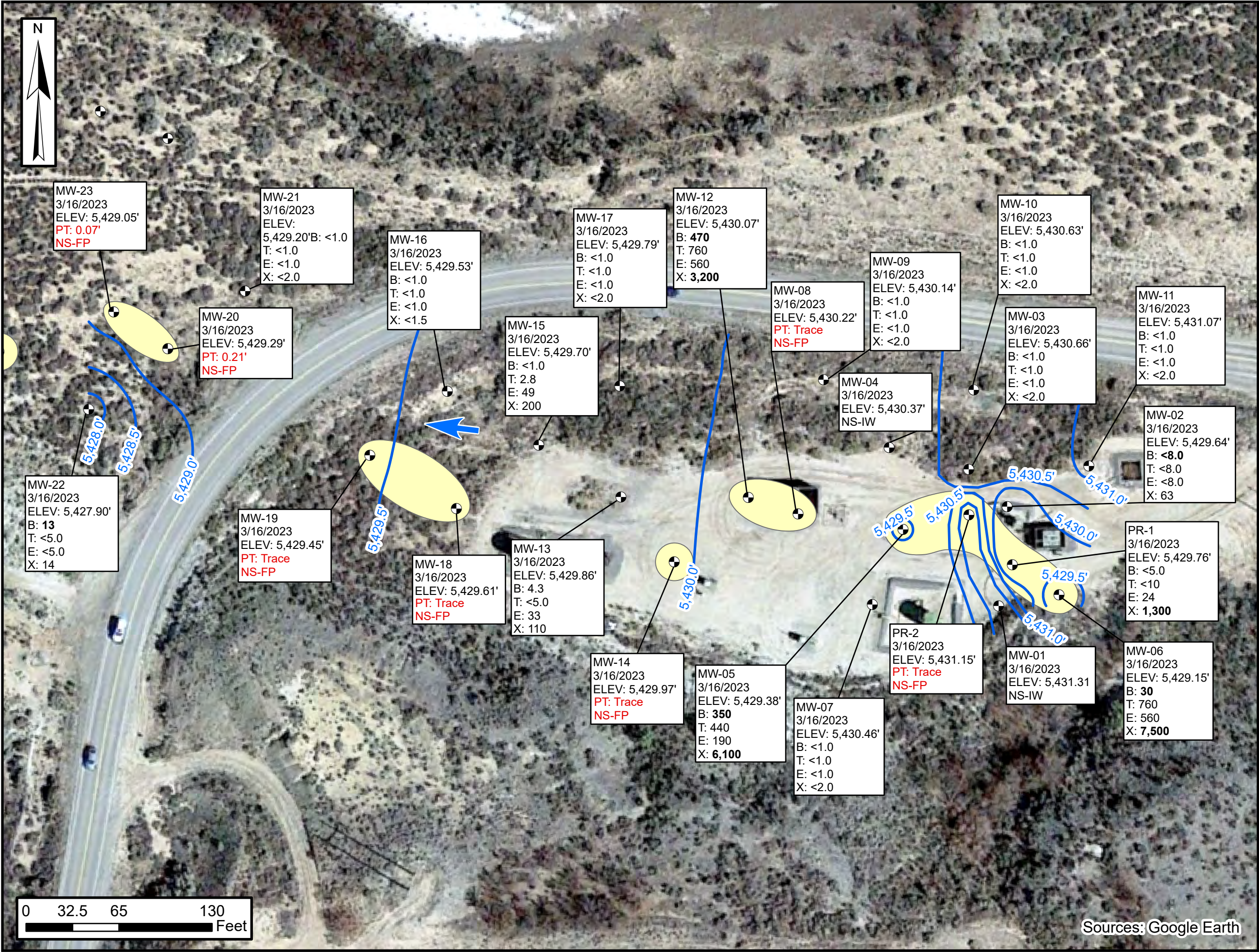












### Legend

- Groundwater Monitoring Well
- Estimated Free Product Plume
- Groundwater Elevation Contour
- Groundwater Flow Direction

Notes:  
ELEV: Groundwater Elevation in Feet Above Mean Sea Level  
B: Benzene in Micrograms per Liter (µg/L)  
T: Toluene (µg/L)  
E: Ethylbenzene (µg/L)  
X: Total Xylenes (µg/L)  
**Bold** Indicates Concentration Exceeds NMWQCC Standard  
NMWQCC: New Mexico Water Quality Conservation Commission  
NS-IW: Not Sampled Due to Insufficient Water Volume  
NS-FP: Not Sampled Due to Free Product in Well  
PT: Free Product Thickness in Feet

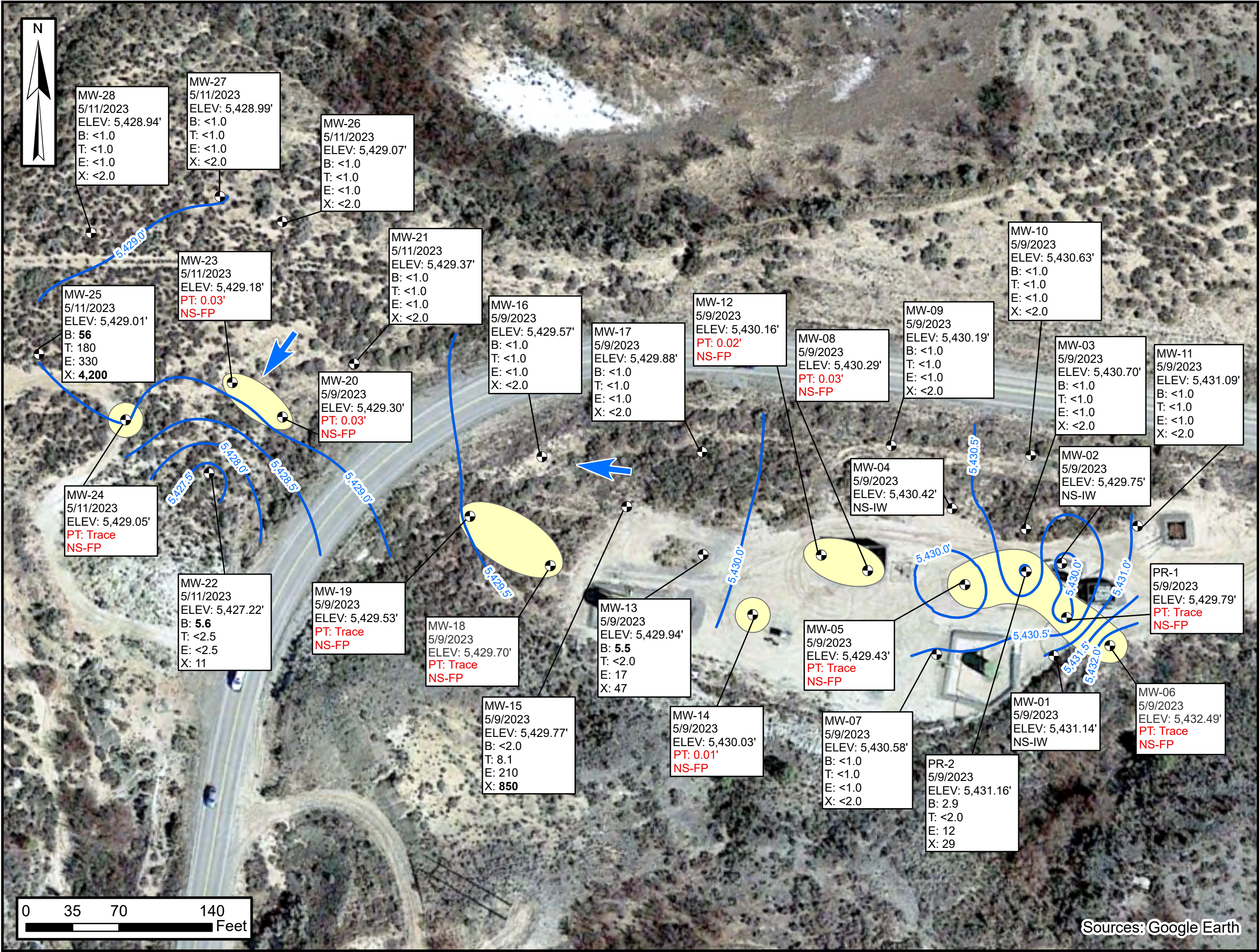
### Groundwater Elevation Contour Map (1st Quarter 2023)

Sullivan GC D #1E  
Hilcorp Energy Company  
36.7001, -107.9649  
San Juan County, New Mexico

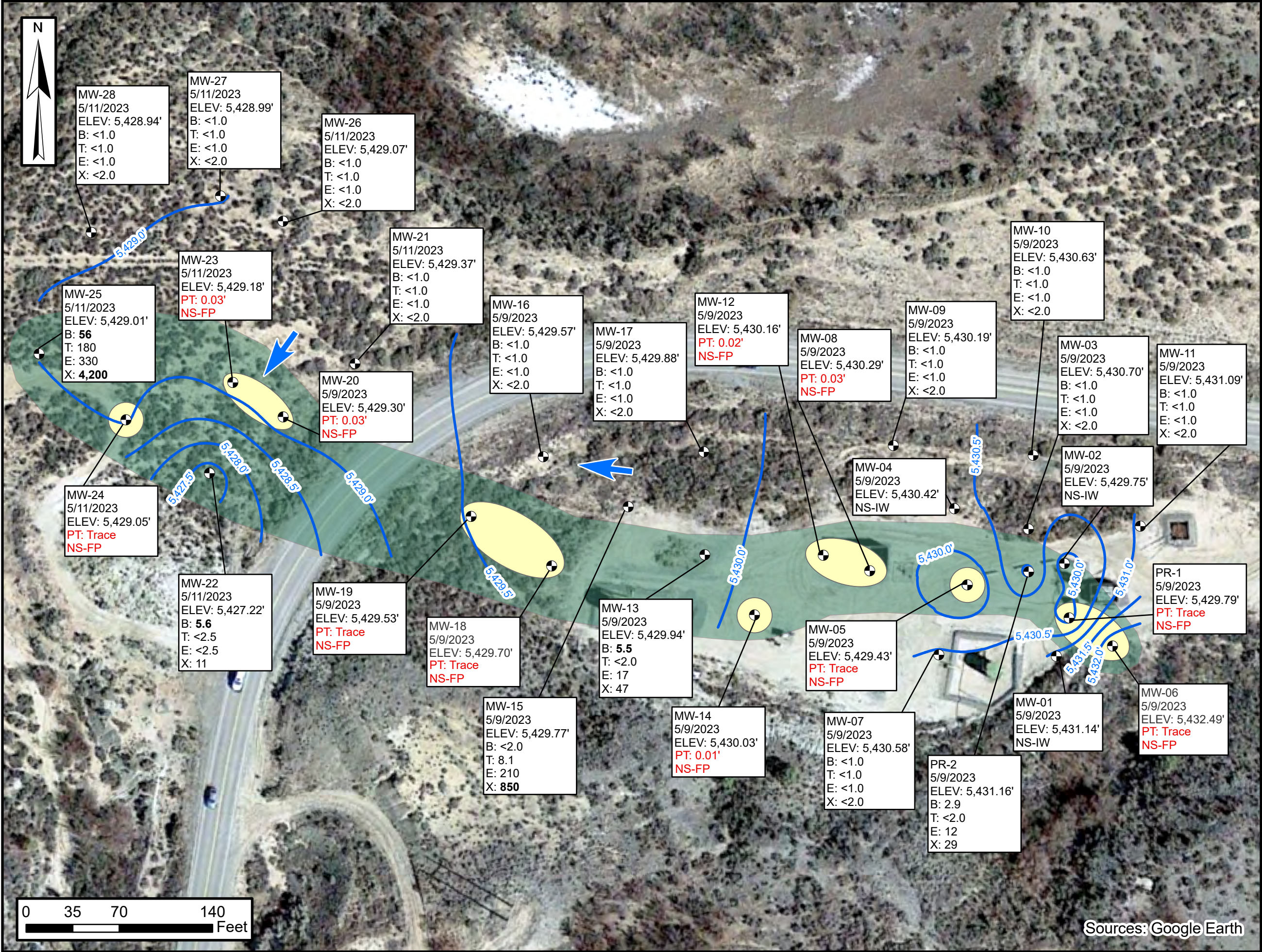
## Figure 7

Environmental, Engineering and Hydrogeologic Consultants



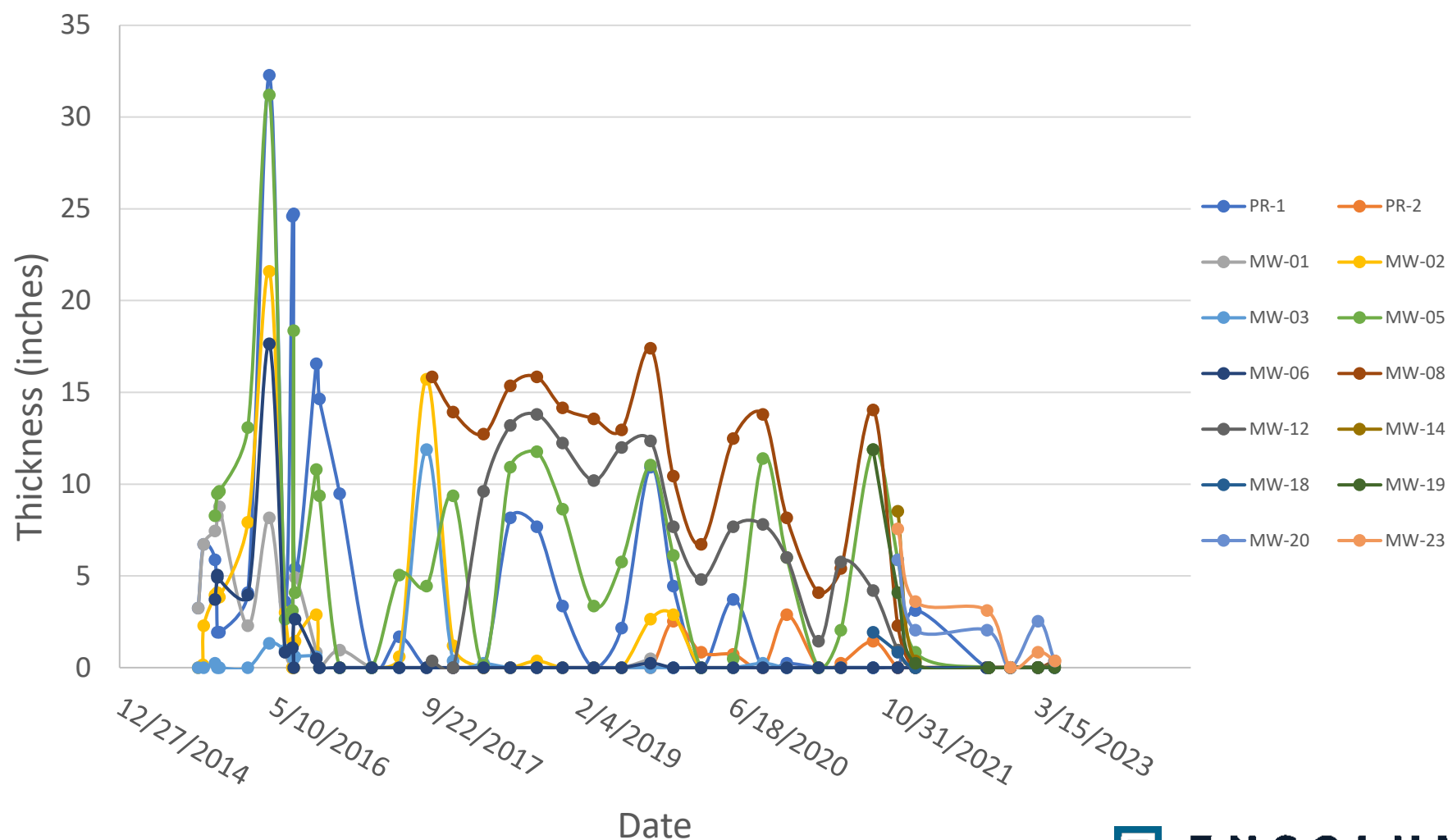




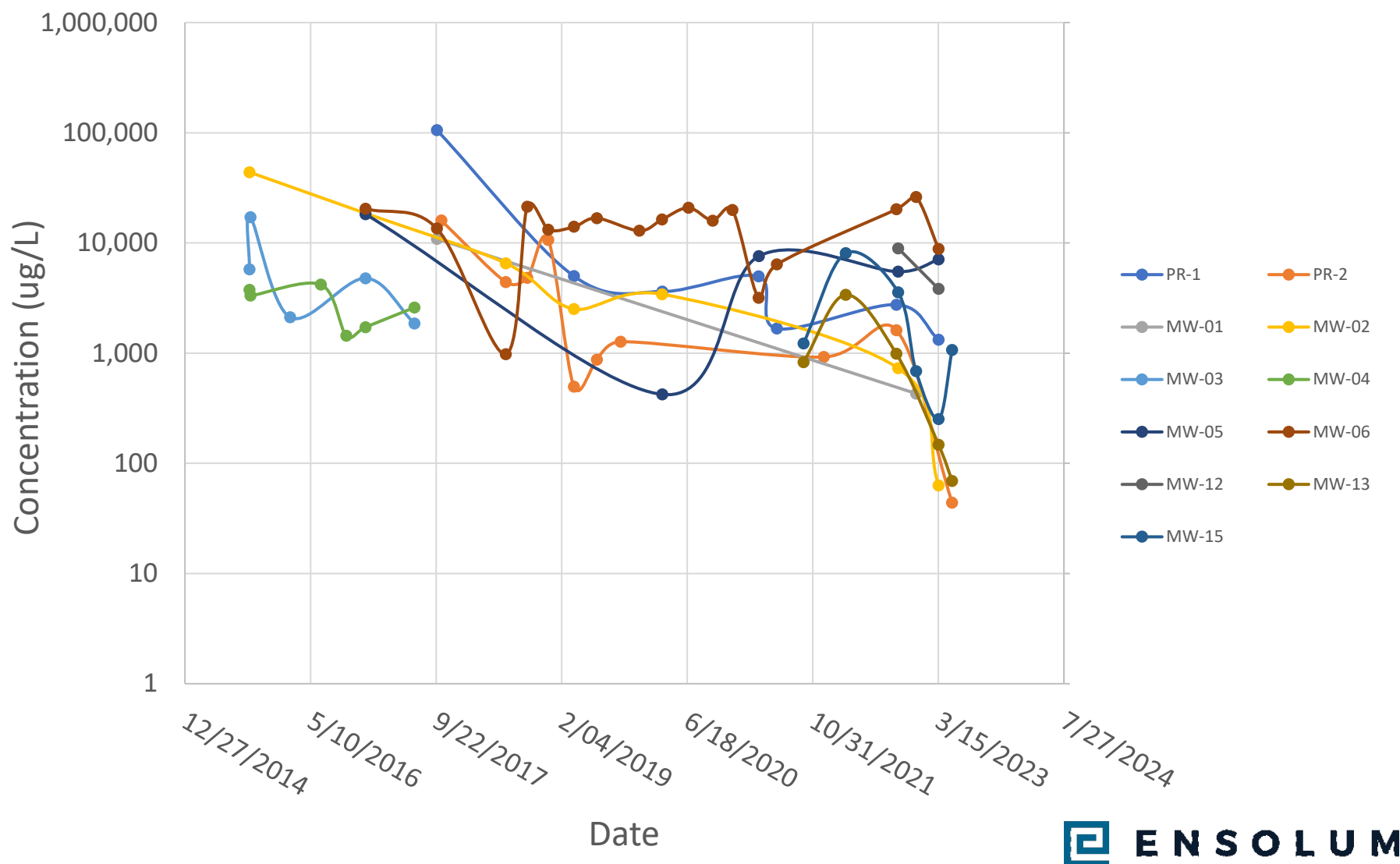




**Figure 10**  
**PSH Thickness Hydrograph**  
**Sullivan Gas Com D #1E**



**Figure 9**  
**Dissolved Phase Total BTEX Hydrograph**  
**Sullivan Gas Com D #1E**







Tables



**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
 Sullivan Gas Com D #1E  
 Hilcorp Energy Company  
 San Juan County, New Mexico

Soil Sample Identification	Sample Date	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)	Chloride (mg/kg)
<b>NMOCD Cleanup Criteria</b>		<b>10</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>50</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>100</b>	<b>600</b>
PR - 2 @ 10 - 15'	10/4/2017	0.00131	<0.00553	<0.000553	0.00299	0.0043	<0.111	<4.42	<4.42	8.951	NA
PR - 2 @ 15 - 20'	10/4/2017	<0.0592	<0.592	0.216	3.09	3.306	85.4	35.7	<4.73	121	NA
MW07 @ 20 - 23'	10/2/2017	<0.0139	<0.139	0.0863	0.278	0.3643	28.0	19.7	<4.44	47.7	NA
MW07 @ 35 - 39'	10/2/2017	0.000787	0.00659	0.000806	0.00839	0.016573	<0.119	<4.78	<4.78	<4.78	NA
MW08 @ 25 - 28'	10/2/2017	0.0163	<0.149	<0.0149	0.212	0.2283	38.8	12.7	<4.76	51.5	NA
MW08 @ 28 - 30'	10/2/2017	0.000929	<0.00571	<0.000571	<0.00171	0.000929	<0.114	<4.57	<4.57	<4.57	NA
MW09 @ 20 - 22'	10/3/2017	0.000966	<0.00617	<0.000617	<0.00185	0.000966	<0.123	<4.94	<4.94	<4.94	NA
MW10 @ 15 - 20'	10/3/2017	<0.000595	<0.00595	<0.000595	<0.00179	ND	<0.119	<4.76	<4.76	<4.76	NA
MW11 @ 18 - 20'	10/3/2017	0.000896	<0.00568	<0.000568	<0.00170	0.000896	<0.114	<4.54	<4.54	<4.54	NA
MW12 @ 15 - 18'	10/4/2017	0.00151	<0.00573	0.000606	0.00365	0.005766	0.161	<4.58	<4.58	0.161	NA
MW13 @ 5-10'	9/20/2021	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<8.8	<44	<44	NA
MW13 @ 26'	9/20/2021	<0.023	<0.046	0.48	3.7	4.18	170	<8.1	<40	170	NA
MW13 @ 30-35'	9/20/2021	<0.024	<0.047	<0.047	<0.094	ND	<4.7	<9.6	<48	<48	NA
MW14 @ 10-15'	9/18/2021	<0.024	<0.047	<0.047	<0.094	ND	<4.7	<9.6	<48	<48	NA
MW14 @ 20-21'	9/18/2021	0.44	15	8.6	150	174	2,800	830	<430	3,630	NA
MW14 @ 35-40'	9/18/2021	<0.023	<0.047	<0.047	<0.094	<0.094	<4.7	<9.8	<49	<49	NA
MW15 @ 20-25'	9/20/2021	<0.025	<0.049	<0.049	<0.098	<0.098	<4.9	<9.4	<47	<47	NA
MW15 @ 26'	9/20/2021	<0.025	<0.050	1.9	17	18.9	490	42	<48	532	NA
MW15 @ 30-35'	9/20/2021	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.9	<50	<50	NA
MW16 @ 0-5'	9/20/2021	<0.023	<0.046	<0.046	<0.092	<0.092	<4.6	<9.6	<48	<48	NA
MW16 @ 25-30'	9/20/2021	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<9.5	<48	<48	NA
MW16 @ 30-35'	9/20/2021	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.4	<47	<47	NA
MW17 @ 10-15'	9/21/2021	<0.025	<0.049	<0.049	<0.099	<0.099	<4.9	<9.8	<49	<49	NA
MW17 @ 24-25'	9/21/2021	<0.024	<0.047	<0.047	<0.094	<0.094	<4.7	<8.4	<42	<42	NA
MW17 @ 30'	9/21/2021	<0.024	<0.049	<0.049	<0.098	<0.098	<4.9	<8.9	<45	<45	NA
MW18 @ 20-22'	9/21/2021	<0.024	<0.047	<0.047	<0.095	<0.095	<4.7	<9.8	<49	<49	NA
MW18 @ 22-25'	9/21/2021	<0.024	<0.048	<0.048	0.11	0.11	<4.8	15	<46	<46	NA
MW18 @ 30-35'	9/21/2021	<0.023	<0.046	<0.046	<0.092	<0.092	<4.6	<9.7	<48	<48	NA



**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
 Sullivan Gas Com D #1E  
 Hilcorp Energy Company  
 San Juan County, New Mexico

Soil Sample Identification	Sample Date	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)	Chloride (mg/kg)
SB17 @ 5-10'	9/21/2021	<0.023	<0.046	<0.046	<0.092	<0.092	<4.6	<9.0	<45	<45	NA
SB17 @ 25-30	9/21/2021	<0.024	<0.047	<0.047	<0.094	<0.094	<4.7	<9.5	<48	<48	NA
SB17 @ 30-35'	9/21/2021	<0.023	<0.046	<0.046	<0.091	<0.091	<4.6	<9.8	<49	<49	NA
SB18 @ 25-30'	9/22/2021	<0.024	<0.047	<0.047	<0.095	<0.095	<4.7	<9.6	<48	<48	NA
SB18 @ 30-35'	9/22/2021	<0.023	<0.046	<0.046	<0.092	<0.092	<4.6	<9.9	<49	<49	NA
MW19 @ 20-25'	9/22/2021	<0.024	<0.048	<0.048	<0.097	<0.097	<4.8	<9.5	<48	<48	NA
MW19 @ 25-30'	9/22/2021	<0.025	0.88	3.3	42	46.18	820	290	<45	1,110	NA
MW19 @ 35'	9/22/2021	<0.024	<0.048	<0.048	<0.097	ND	<4.8	<9.7	<49	<49	NA
MW20 @ 20-25'	10/5/2021	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<9.3	<47	<47	<60
MW20 @ 25-30'	10/5/2021	<0.024	<0.048	<0.048	<0.096	<0.096	6.4	10	<49	16.4	NA
MW20 @ 30-35'	10/5/2021	<0.49	1.6	3.6	30	35.2	610	65	<46	675	NA
MW20 @ 35-40'	10/5/2021	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.4	<47	<47	NA
MW21 @ 5-10'	10/5/2021	<0.023	<0.047	<0.047	<0.094	<0.094	<4.7	<9.6	<48	<48	<60
MW21 @ 20-30'	10/5/2021	<0.024	<0.047	<0.047	<0.094	<0.094	<4.7	<9.1	<46	<46	NA
MW21 @ 30-35'	10/5/2021	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<8.3	<42	<42	NA
MW22 @ 15-20'	10/6/2021	<0.024	<0.048	<0.048	<0.096	<0.096	<4.8	<9.2	<46	<46	NA
MW22 @ 20-25'	10/6/2021	<0.024	<0.048	<0.048	<0.095	<0.095	<4.8	<9.3	<47	<47	<60
MW22 @ 25-30'	10/6/2021	<0.023	<0.046	<0.046	<0.092	<0.092	<4.6	9.8	<46	9.8	NA
MW22 @ 30-35'	10/6/2021	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<9.3	<46	<46	NA
MW22 @ 32.5-35	10/6/2021	<0.023	<0.046	<0.046	<0.093	<0.093	<4.6	<9.2	<46	<46	NA
SB19 @ 20-26'	10/6/2021	<0.024	<0.048	<0.048	0.30	0.30	<4.8	<9.5	<47	<47	<60
SB19 @ 31-36'	10/6/2021	<0.024	<0.047	<0.047	<0.095	<0.095	<4.7	<8.8	<44	<44	NA
MW23 @ 20-25'	10/6/2021	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.5	<47	<47	NA
MW23 @ 25-30'	10/6/2021	<0.048	<0.095	0.20	2.4	2.6	110	65	<43	175	NA
MW23 @ 30-35'	10/6/2021	0.30	4.3	3.40	35	43.00	980	110	<45	1,090	NA
MW23 @ 35-40'	10/6/2021	<0.024	0.050	<0.049	0.43	0.48	<4.9	<8.4	<42	<42	NA
BH24- 25-30	4/15/2023	<0.025	<0.050	<0.050	<0.10	<0.10	<5.0	<9.8	<49	<49	NA
BH24- 30-35	4/15/2023	<0.048	4.9	5.0	62	71.9	950	310	<50	1,260	NA
BH24- 37-38	4/15/2023	<0.024	<0.049	<0.049	<0.097	<0.097	<4.9	<8.9	<44	<44	NA



**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
 Sullivan Gas Com D #1E  
 Hilcorp Energy Company  
 San Juan County, New Mexico

Soil Sample Identification	Sample Date	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)	Chloride (mg/kg)
BH25- 30-35	4/15/2023	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<9.3	<47	<47	NA
BH25- 35-40	4/15/2023	<0.024	<0.047	<0.047	<0.095	<0.095	<4.7	<10	<50	<50	NA
BH25- 44-45	4/15/2023	<0.024	<0.047	<0.047	<0.094	<0.094	<4.7	<9.8	<49	<49	NA
BH26- 30-35	4/16/2023	<0.024	<0.048	<0.048	<0.097	<0.097	<4.8	12	<49	12	NA
BH26- 40-42.5	4/16/2023	<0.024	<0.048	<0.048	<0.097	<0.097	<4.8	<9.8	<49	<49	NA
BH27- 30-35	4/16/2023	<0.025	<0.050	<0.050	<0.099	<0.099	<5.0	<9.5	<47	<47	NA
BH27- 35-40	4/16/2023	<0.024	<0.048	<0.048	<0.097	<0.097	<4.8	<9.9	<50	<50	NA
BH28- 30-35	4/16/2023	<0.024	<0.049	<0.049	<0.098	<0.098	<4.9	10	<50	10	NA
BH28- 40-45	4/16/2023	<0.024	<0.047	<0.047	<0.095	<0.095	<4.7	<9.8	<49	<49	NA

**Notes:**

BTEX: benzene, toluene, ethylbenzene, total xylenes

DRO: diesel range organics

GRO: gasoline range organics

mg/kg: milligrams per kilogram

MRO: motor oil range organics

NA: not analyzed

NE: not established

NMOCD: New Mexico Oil Conservation Division

TPH: total petroleum hydrocarbons

&lt;: indicates result is less than the stated laboratory reporting limit

Concentrations in **bold** and shaded exceed the NMOCD Table I Closure Criteria



**Table 2**  
**WELL CONSTRUCTION INFORMATION**  
 Sullivan Gas Com D #1E  
 Hilcorp Energy Company  
 San Juan County, New Mexico

Boring/Well ID	Latitude	Longitude	Top of Casing Elevation	Total Boring Depth (feet bgs)	Well Screen Interval (feet bgs)
PR-1	36.70014911	-107.9643945	5,452.23	29.5	11.5 - 26.5
PR-2	36.7002417	-107.9645017	5,452.08	30.0	15 - 30
MW-01	36.70006912	-107.9644243	5,454.15	23.0	12 - 23
MW-02	36.70026023	-107.964411	5,451.95	23.0	12 - 23
MW-03	36.70032897	-107.9645056	5,452.50	23.0	12 - 23
MW-04	36.70036664	-107.9646967	5,451.92	23.0	12 - 23
MW-05	36.7002104	-107.9646575	5,451.89	30.0	15 - 30
MW-06	36.70009366	-107.9642812	5,454.95	27.0	17 - 27
MW-07	36.70006471	-107.9647249	5,456.00	39.0	15 - 30
MW-08	36.70023326	-107.9649084	5,452.48	30.0	15 - 30
MW-09	36.70049268	-107.9648579	5,451.17	27.0	12 - 27
MW-10	36.70048206	-107.9644992	5,448.71	25.0	10 - 25
MW-11	36.70034303	-107.9642196	5,450.40	30.0	15 - 30
MW-12	36.70026243	-107.9650284	5,452.44	27.0	17 - 27
MW-13	36.70025601	-107.9653317	5,452.00	35.0	20 - 30
MW-14	36.70013446	-107.9651999	5,453.17	40.0	14 - 29
MW-15	36.70035018	-107.9655314	5,456.23	35.0	20 - 30
MW-16	36.7004475	-107.9657527	5,455.75	35.0	20 - 30
MW-17	36.70046796	-107.9653425	5,453.21	30.0	19 - 29
MW-18	36.70022327	-107.9657226	5,458.15	35.0	20 - 30
MW-19	36.70032041	-107.9659329	5,455.83	35.0	15 - 30
MW-20	36.70051312	-107.9664216	5,459.33	40.0	20 - 35
MW-21	36.70062797	-107.9662418	5,457.53	35.0	19 - 34
MW-22	36.70039244	-107.9666055	5,463.22	35.0	20 - 35
MW-23	36.70058066	-107.966553	5,458.66	35.0	20 - 35
MW-24	36.70049703	-107.9668236	5,465.96	38.0	23 - 38
MW-25	36.70062797	-107.9670511	5,466.95	45.0	27 - 42
MW-26	36.70091606	-107.9664372	5,462.02	42.0	32 - 42
MW-27	36.70096426	-107.9665994	5,462.65	40.0	32 - 40
MW-28	36.70088047	-107.9669273	5,465.90	45.0	30 - 40

**Notes:**

bgs: below ground surface

BTOC: below top of well casing



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
PR-1A	5,466.00	9/9/2015	19.24	19.69	0.45	5.40	5,446.67
		9/19/2015	--	--	--	0.08	--
		9/25/2015	--	--	--	0.40	--
		9/28/2015	19.30	19.83	0.53	6.36	5,446.59
PR-1	5,452.23	9/10/2015	21.55	21.82	0.27	3.24	5,430.63
		9/19/2015	--	--	--	0.21 **	--
		9/25/2015	--	--	--	0.19 **	--
		9/28/2015	20.95	21.51	0.56	6.72	5,431.17
		11/4/2015	19.09	19.58	0.49	5.88	5,433.04
		11/11/2015	19.23	19.39	0.16	1.92	5,432.97
		11/18/2015	19.28	19.44	0.16	1.92	5,432.92
		2/19/2016	19.97	20.31	0.34	4.08	5,432.19
		4/29/2016	19.32	22.01	2.69	32.28	5,432.37
		6/20/2016	20.75	21.05	0.30	3.60	5,431.42
		7/14/2016	18.86	20.91	2.05	24.60	5,432.96
		7/18/2016	18.89	20.95	2.06	24.72	5,432.93
		7/22/2016	19.43	19.88	0.45	5.40	5,432.71
		9/30/2016	18.72	20.10	1.38	16.56	5,433.23
		10/10/2016	18.72	19.94	1.22	14.64	5,433.27
		12/15/2016	19.35	20.14	0.79	9.48	5,432.72
		3/30/2017	NP	19.90	NP	NP	5,432.33
		6/28/2017	20.21	20.35	0.14	1.68	5,431.99
		9/25/2017	NP	21.00	NP	NP	5,431.23
		12/21/2017	NP	22.46	NP	NP	5,429.77
		3/30/2018	NP	21.36	NP	NP	5,430.87
		6/26/2018	21.70	22.38	0.68	8.16	5,430.39
		9/20/2018	23.44	24.08	0.64	7.68	5,428.66
		12/13/2018	22.05	22.33	0.28	3.36	5,430.12
		3/25/2019	NP	21.51	NP	NP	5,430.72
		6/24/2019	22.11	22.29	0.18	2.16	5,430.08
		9/27/2019	22.74	23.65	0.91	10.92	5,429.31
		12/10/2019	22.58	22.95	0.37	4.44	5,429.58
		3/10/2020	NP	22.34	NP	NP	5,429.89
		6/23/2020	22.60	22.91	0.31	3.72	5,429.57
		9/28/2020	NP	23.91	NP	NP	5,428.32
		12/15/2020	24.50	24.52	0.02	0.24	5,427.73
		3/29/2021	NP	22.69	NP	NP	5,429.54
		6/10/2021	NP	22.77	NP	NP	5,429.46
		9/23/2021	NP	23.42	NP	NP	5,428.81
		12/13/2021	NP	21.99	NP	NP	5,430.24
		2/8/2022	22.96	23.22	0.26	3.12	5,429.22
		9/29/2022	NP	21.62	NP	NP	5,430.61
		12/16/2022	TRACE	22.08	TRACE	TRACE	5,430.15
		3/16/2023	NP	22.47	NP	NP	5,429.76
		5/9/2023	TRACE	22.44	TRACE	TRACE	5,429.79



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
PR-2	5,452.08	12/21/2017	NP	20.71	NP	NP	5,431.37
		3/30/2018	NP	20.92	NP	NP	5,431.16
		6/26/2018	NP	21.38	NP	NP	5,430.70
		9/20/2018	NP	21.79	NP	NP	5,430.29
		12/13/2018	NP	21.67	NP	NP	5,430.41
		3/25/2019	NP	21.99	NP	NP	5,430.09
		6/24/2019	NP	22.81	NP	NP	5,429.27
		9/27/2019	NP	22.48	NP	NP	5,429.60
		12/10/2019	22.15	22.36	0.21	2.52	5,429.89
		3/10/2020	21.88	21.95	0.07	0.84	5,430.19
		6/23/2020	22.21	22.27	0.06	0.72	5,429.86
		9/28/2020	NP	22.82	NP	NP	5,429.26
		12/15/2020	22.52	22.76	0.24	2.88	5,429.51
		3/29/2021	Trace	22.27	Trace	Trace	5,429.81
		6/10/2021	22.31	22.33	0.02	0.24	5,429.77
		9/23/2021	22.97	23.09	0.12	1.44	5,429.09
		12/13/2021	NP	22.34	NP	NP	5,429.74
		2/8/2022	TRACE	22.09	TRACE	TRACE	5,429.99
		9/29/2022	TRACE	21.95	TRACE	TRACE	5,430.13
		12/16/2022	TRACE	21.38	TRACE	TRACE	5,430.70
MW-01	5,454.15	3/16/2023	TRACE	20.93	TRACE	TRACE	5,431.15
		5/9/2023	TRACE	20.92	TRACE	TRACE	5,431.16
		9/10/2015	21.55	21.82	0.27	3.24	5,432.55
		9/19/2015	--	--	--	0.21 **	--
		9/25/2015	--	--	--	0.19 **	--
		9/28/2015	20.95	21.51	0.56	6.72	5,433.09
		11/4/2015	20.98	21.60	0.62	7.44	5,433.05
		11/11/2015	21.05	21.74	0.69	8.28	5,432.96
		11/18/2015	21.08	21.81	0.73	8.76	5,432.92
		2/19/2016	21.65	21.84	0.19	2.28	5,432.46
		4/29/2016	21.11	21.79	0.68	8.16	5,432.90
		6/20/2016	22.96	23.03	0.07	0.84	5,431.18
		7/14/2016	NP	20.71	NP	NP	5,433.44
		7/18/2016	20.80	20.91	0.11	1.32	5,433.33
		7/22/2016	21.18	21.59	0.41	4.92	5,432.89
		9/30/2016	20.74	20.81	0.07	0.84	5,433.40
		10/10/2016	NP	20.69	NP	NP	5,433.46
		12/15/2016	22.41	22.33	0.08	0.96	5,431.88
		3/30/2017	NP	21.76	NP	NP	5,432.39
		6/28/2017	Trace	21.88	NP	NP	5,432.27
		9/25/2017	NP	21.85	NP	NP	5,432.30
		12/21/2017	Dry - No Product or Groundwater Observed				
		3/30/2018	NP	21.85	NP	NP	5,432.30
		6/26/2018	NP	21.90	NP	NP	5,432.25
		9/20/2018	Dry - No Product or Groundwater Observed				
		12/13/2018	Dry - No Product or Groundwater Observed				
		3/25/2019	NP	22.03	NP	NP	5,432.12
		6/24/2019	NP	22.16	NP	NP	5,431.99
		9/27/2019	22.04	22.00	0.04	0.48	5,432.18
		12/10/2019	Dry - No Product or Groundwater Observed				



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-01	5,454.15	3/10/2020	NP	22.13	NP	NP	5,432.02
		6/23/2020	NP	22.13	NP	NP	5,432.02
		9/28/2020	NP	22.45	NP	NP	5,431.70
		12/15/2020	NP	22.11	NP	NP	5,432.04
		3/29/2021	NP	22.12	NP	NP	5,432.03
		6/10/2021	Dry - No Product or Groundwater Observed				
		9/23/2021	Dry - No Product or Groundwater Observed				
		12/13/2021	Dry - No Product or Groundwater Observed				
		2/8/2022	NP	23.08	NP	NP	5,431.07
		9/29/2022	Dry - No Product or Groundwater Observed				
		12/16/2022	NP	22.82	NP	NP	5,431.33
		3/16/2023	NP	22.84	NP	NP	5,431.31
		5/9/2023	NP	23.01	NP	NP	5,431.14
MW-02	5,451.95	9/10/2015	NP	18.85	NP	NP	5,433.10
		9/19/2015	--	--	--	0.05 **	--
		9/25/2015	--	--	--	0.15 **	--
		9/28/2015	18.85	19.04	0.19	2.28	5,433.06
		11/4/2015	18.88	19.21	0.33	3.96	5,433.00
		11/11/2015	18.97	19.31	0.34	4.08	5,432.91
		11/18/2015	18.98	19.30	0.32	3.84	5,432.91
		2/19/2016	19.63	20.29	0.66	7.92	5,432.19
		4/29/2016	19.47	21.27	1.80	21.60	5,432.12
		6/20/2016	20.30	20.55	0.25	3.00	5,431.60
		7/14/2016	NP	19.04	NP	NP	5,432.91
		7/18/2016	NP	19.05	NP	NP	5,432.90
		7/22/2016	19.07	19.19	0.12	1.44	5,432.86
		9/30/2016	18.69	18.93	0.24	2.88	5,433.21
		10/10/2016	NP	18.64	NP	NP	5,433.31
		12/15/2016	NP	19.20	NP	NP	5,432.75
		3/30/2017	NP	19.69	NP	NP	5,432.26
		6/28/2017	19.90	19.95	0.05	0.60	5,432.04
		9/25/2017	20.54	21.85	1.31	15.72	5,431.15
		12/21/2017	22.05	22.15	0.10	1.20	5,429.88
		3/30/2018	NP	21.10	NP	NP	5,430.85
		6/26/2018	NP	21.42	NP	NP	5,430.53
		9/20/2018	23.12	23.15	0.03	0.36	5,428.82
		12/13/2018	NP	22.47	NP	NP	5,429.48
		3/25/2019	NP	22.92	NP	NP	5,429.03
		6/24/2019	NP	23.02	NP	NP	5,428.93
		9/27/2019	22.56	22.78	0.22	2.64	5,431.55
		12/10/2019	22.54	22.78	0.24	2.88	5,431.56
		3/10/2020	NP	22.03	NP	NP	5,429.92
		6/23/2020	NP	22.32	NP	NP	5,429.63
		9/28/2020	Dry - No Product or Groundwater Observed				
		12/15/2020	Dry - No Product or Groundwater Observed				
		3/29/2021	NP	22.42	NP	NP	5,429.53
		6/10/2021	NP	22.49	NP	NP	5,429.46
		9/23/2021	Dry - No Product or Groundwater Observed				
		12/13/2021	22.04	22.12	0.08	0.96	5,429.89
		2/8/2022	Dry - No Product or Groundwater Observed				
		10/6/2022	NP	21.48	NP	NP	5,430.47
		12/16/2022	TRACE	21.82	TRACE	TRACE	5,430.13
		3/16/2023	NP	22.31	NP	NP	5,429.64
		5/9/2023	NP	22.20	NP	NP	5,429.75





<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-03	5,452.50	9/10/2015	NP	19.45	NP	NP	5,433.05
		9/28/2015	NP	19.49	NP	NP	5,433.01
		11/4/2015	19.54	19.56	0.02	0.24	5,432.96
		11/11/2015	NP	19.65	NP	NP	5,432.85
		11/18/2015	NP	19.67	NP	NP	5,432.83
		2/19/2016	NP	20.44	NP	NP	5,432.06
		4/29/2016	20.54	20.65	0.11	1.32	5,431.94
		6/20/2016	19.70	19.78	0.08	0.96	5,432.78
		7/14/2016	19.59	19.65	0.06	0.72	5,432.90
		7/18/2016	19.65	19.69	0.04	0.48	5,432.84
		7/22/2016	19.61	19.66	0.05	0.60	5,432.88
		9/30/2016	19.28	19.33	0.05	0.60	5,433.21
		10/10/2016	NP	19.23	NP	NP	5,433.27
		12/15/2016	NP	19.82	NP	NP	5,432.68
		3/30/2017	NP	20.36	NP	NP	5,432.14
		6/28/2017	NP	20.77	NP	NP	5,431.73
		9/25/2017	21.14	22.13	0.99	11.88	5,431.16
		12/21/2017	21.52	21.55	0.03	0.36	5,430.97
		3/30/2018	21.75	21.77	0.02	0.24	5,430.75
		6/26/2018	NP	22.20	NP	NP	5,430.30
		9/20/2018	NP	22.62	NP	NP	5,429.88
		12/13/2018	NP	22.47	NP	NP	5,430.03
		3/25/2019	NP	22.35	NP	NP	5,430.15
		6/24/2019	NP	22.53	NP	NP	5,429.97
		9/27/2019	NP	22.34	NP	NP	5,430.16
		12/10/2019	NP	23.01	NP	NP	5,429.49
		3/10/2020	NP	22.72	NP	NP	5,429.78
		6/23/2020	NP	23.03	NP	NP	5,429.47
		9/28/2020	23.12	23.14	0.02	0.24	5,429.38
		12/15/2020	NP	23.15	NP	NP	5,429.35
		3/29/2021	NP	23.03	NP	NP	5,429.47
		6/10/2021	NP	23.11	NP	NP	5,429.39
		9/23/2021	NP	23.22	NP	NP	5,429.28
		12/13/2021	Dry - No Product or Groundwater Observed				
		2/8/2022	NP	22.85	NP	NP	5,429.65
		9/29/2022	NP	22.75	NP	NP	5,429.75
		12/16/2022	NP	22.22	NP	NP	5,430.28
		3/16/2023	NP	21.84	NP	NP	5,430.66
		5/9/2023	NP	21.80	NP	NP	5,430.70



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-04	5,451.92	9/10/2015	NP	18.94	NP	NP	5,432.98
		9/28/2015	NP	19.98	NP	NP	5,431.94
		11/4/2015	NP	19.08	NP	NP	5,432.84
		11/11/2015	NP	19.20	NP	NP	5,432.72
		11/18/2015	NP	19.21	NP	NP	5,432.71
		2/19/2016	NP	20.04	NP	NP	5,431.88
		4/29/2016	NP	20.11	NP	NP	5,431.81
		6/20/2016	NP	19.10	NP	NP	5,432.82
		7/14/2016	NP	19.01	NP	NP	5,432.91
		7/18/2016	NP	19.00	NP	NP	5,432.92
		7/22/2016	NP	18.99	NP	NP	5,432.93
		9/30/2016	NP	18.72	NP	NP	5,433.20
		10/10/2016	NP	18.62	NP	NP	5,433.30
		12/15/2016	NP	19.36	NP	NP	5,432.56
		3/30/2017	NP	19.98	NP	NP	5,431.94
		6/28/2017	NP	20.30	NP	NP	5,431.62
		9/25/2017	20.86	20.91	0.05	0.60	5,431.05
		12/21/2017	NP	21.12	NP	NP	5,430.80
		3/30/2018	NP	21.37	NP	NP	5,430.55
		6/26/2018	NP	21.78	NP	NP	5,430.14
		9/20/2018	Dry - No Product or Groundwater Observed				
		12/13/2018	Dry - No Product or Groundwater Observed				
		3/25/2019	NP	22.31	NP	NP	5,429.61
		6/24/2019	NP	22.11	NP	NP	5,429.81
		9/27/2019	NP	22.14	NP	NP	5,429.78
		12/10/2019	NP	22.18	NP	NP	5,429.74
		3/10/2020	NP	22.22	NP	NP	5,429.70
		6/23/2020	NP	22.27	NP	NP	5,429.65
		9/28/2020	NP	22.30	NP	NP	5,429.62
		12/15/2020	NP	22.26	NP	NP	5,429.66
		3/29/2021	NP	22.29	NP	NP	5,429.63
		6/10/2021	NP	22.29	NP	NP	5,429.63
		9/23/2021	Dry - No Product or Groundwater Observed				
		12/13/2021	Dry - No Product or Groundwater Observed				
		2/8/2022	Dry - No Product or Groundwater Observed				
		9/29/2022	Dry - No Product or Groundwater Observed				
		12/16/2022	Dry - No Product or Groundwater Observed				
		3/16/2023	NP	21.55	NP	NP	5,430.37
		5/9/2023	NP	21.50	NP	NP	5,430.42



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-05	5,451.89	11/4/2015	18.82	19.51	0.69	8.28	5,432.93
		11/11/2015	18.9	19.69	0.79	9.48	5,432.83
		11/18/2015	18.93	19.73	0.8	9.60	5,432.80
		2/19/2016	19.66	20.75	1.09	13.08	5,432.01
		4/29/2016	19.35	21.95	2.60	31.20	5,432.02
		6/20/2016	20.18	20.40	0.22	2.64	5,431.67
		7/14/2016	18.63	18.89	0.26	3.12	5,433.21
		7/18/2016	18.60	20.13	1.53	18.36	5,432.98
		7/22/2016	18.84	19.18	0.34	4.08	5,432.98
		9/30/2016	18.44	19.34	0.90	10.80	5,433.27
		10/10/2016	18.39	19.17	0.78	9.36	5,433.34
		12/15/2016	NP	19.24	NP	NP	5,432.65
		3/30/2017	NP	20.42	NP	NP	5,431.47
		6/28/2017	19.98	20.40	0.42	5.04	5,431.83
		9/25/2017	20.57	20.94	0.37	4.44	5,431.25
		12/21/2017	22.03	22.81	0.78	9.36	5,429.70
		3/30/2018	21.15	21.16	0.01	0.12	5,430.74
		6/26/2018	21.48	22.39	0.91	10.92	5,430.23
		9/20/2018	23.02	24.00	0.98	11.76	5,428.67
		12/13/2018	21.83	22.55	0.72	8.64	5,429.92
		3/25/2019	21.79	22.07	0.28	3.36	5,430.04
		6/24/2019	21.94	22.42	0.48	5.76	5,429.85
		9/27/2019	22.60	23.52	0.92	11.04	5,429.11
		12/10/2019	22.46	22.97	0.51	6.12	5,429.33
		3/10/2020	NP	22.25	NP	NP	5,429.64
		6/23/2020	22.41	22.45	0.04	0.48	5,429.47
		9/28/2020	23.00	23.95	0.95	11.40	5,428.70
		12/15/2020	22.80	23.30	0.50	6.00	5,428.99
		3/29/2021	NP	22.62	NP	NP	5,429.27
		6/10/2021	22.66	22.83	0.17	2.04	5,429.20
		9/23/2021	23.16	24.15	0.99	11.88	5,428.53
		12/13/2021	22.34	22.83	0.49	5.88	5,429.45
		2/8/2022	23.48	23.55	0.07	0.84	5,428.40
		10/6/2022	NP	22.18	NP	NP	5,429.71
		12/16/2022	TRACE	22.81	TRACE	TRACE	5,429.08
		3/16/2023	NP	22.51	NP	NP	5,429.38
		5/9/2023	TRACE	22.46	TRACE	TRACE	5,429.43



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-06	5,454.95	11/4/2015	21.81	22.12	0.31	3.72	5,433.08
		11/11/2015	21.88	22.3	0.42	5.04	5,432.99
		11/11/2015	21.89	22.3	0.41	4.92	5,432.98
		2/19/2016	22.58	22.91	0.33	3.96	5,432.30
		4/29/2016	22.02	23.49	1.47	17.64	5,432.64
		6/20/2016	23.53	23.60	0.07	0.84	5,431.41
		7/14/2016	21.94	22.03	0.09	1.08	5,432.99
		7/18/2016	NP	21.79	NP	NP	5,433.16
		7/22/2016	22.09	22.31	0.22	2.64	5,432.82
		9/30/2016	21.70	21.74	0.04	0.48	5,433.24
		10/10/2016	NP	21.64	NP	NP	5,433.31
		12/15/2016	NP	22.11	NP	NP	5,432.84
		3/30/2017	NP	22.55	NP	NP	5,432.40
		6/28/2017	Trace	23.00	NP	NP	5,431.95
		9/25/2017	NP	23.67	NP	NP	5,431.28
		12/21/2017	NP	24.92	NP	NP	5,430.03
		3/30/2018	NP	23.97	NP	NP	5,430.98
		6/26/2018	NP	24.46	NP	NP	5,430.49
		9/20/2018	NP	26.18	NP	NP	5,428.77
		12/13/2018	NP	25.75	NP	NP	5,429.20
		3/25/2019	NP	24.59	NP	NP	5,430.36
		6/24/2019	NP	24.76	NP	NP	5,430.19
		9/27/2019	25.55	25.57	0.02	0.24	5,429.40
		12/10/2019	NP	26.26	NP	NP	5,428.69
		3/10/2020	NP	24.95	NP	NP	5,430.00
		6/23/2020	NP	25.27	NP	NP	5,429.68
		9/28/2020	NP	25.98	NP	NP	5,428.97
		12/15/2020	NP	26.92	NP	NP	5,428.03
		3/29/2021	NP	25.30	NP	NP	5,429.65
		6/10/2021	NP	25.40	NP	NP	5,429.55
		9/23/2021	NP	26.03	NP	NP	5,428.92
		12/13/2021	NP	25.04	NP	NP	5,429.91
		2/8/2022	NP	25.73	NP	NP	5,429.22
		9/29/2022	NP	25.49	NP	NP	5,429.46
		12/16/2022	NP	24.60	NP	NP	5,430.35
		3/16/2023	TRACE	25.80	TRACE	TRACE	5,429.15
		5/9/2023	TRACE	22.46	TRACE	TRACE	5,432.49



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-07	5,456.00	10/13/2017	28.37	28.39	0.02	0.24	5,427.63
		12/21/2017	NP	24.72	NP	NP	5,431.28
		3/30/2018	NP	25.26	NP	NP	5,430.74
		6/26/2018	NP	24.16	NP	NP	5,431.84
		9/20/2018	NP	25.83	NP	NP	5,430.17
		12/13/2018	NP	25.87	NP	NP	5,430.13
		3/25/2019	NP	25.69	NP	NP	5,430.31
		6/24/2019	NP	26.03	NP	NP	5,429.97
		9/27/2019	NP	26.48	NP	NP	5,429.52
		12/10/2019	NP	26.53	NP	NP	5,429.47
		3/10/2020	NP	25.88	NP	NP	5,430.12
		6/23/2020	NP	26.54	NP	NP	5,429.46
		9/28/2020	NP	26.90	NP	NP	5,429.10
		12/15/2020	NP	26.72	NP	NP	5,429.28
		3/29/2021	NP	26.67	NP	NP	5,429.33
		6/10/2021	NP	26.68	NP	NP	5,429.32
		9/23/2021	NP	26.78	NP	NP	5,429.22
		12/13/2021	NP	26.71	NP	NP	5,429.29
		2/8/2022	NP	26.32	NP	NP	5,429.68
		9/29/2022	NP	25.98	NP	NP	5,430.02
		12/16/2022	NP	25.48	NP	NP	5,430.52
		3/16/2023	NP	25.54	NP	NP	5,430.46
		5/9/2023	NP	25.42	NP	NP	5,430.58
MW-08	5,452.48	10/13/2017	21.21	22.53	1.32	15.84	5,431.01
		12/21/2017	21.48	22.64	1.16	13.92	5,430.77
		3/30/2018	21.80	22.86	1.06	12.72	5,430.47
		6/26/2018	22.11	23.39	1.28	15.36	5,430.11
		9/20/2018	22.46	23.78	1.32	15.84	5,429.76
		12/13/2018	22.47	23.65	1.18	14.16	5,429.77
		3/25/2019	22.43	23.56	1.13	13.56	5,429.82
		6/24/2019	22.58	23.66	1.08	12.96	5,429.68
		9/27/2019	23.29	24.74	1.45	17.40	5,428.90
		12/10/2019	23.17	24.04	0.87	10.44	5,429.14
		3/10/2020	22.93	23.49	0.56	6.72	5,429.44
		6/23/2020	23.20	24.24	1.04	12.48	5,429.07
		9/28/2020	23.75	24.90	1.15	13.80	5,428.50
		12/15/2020	23.55	24.23	0.68	8.16	5,428.79
		3/29/2021	23.30	23.64	0.34	4.08	5,429.11
		6/10/2021	23.41	23.86	0.45	5.40	5,428.98
		9/23/2021	23.94	25.11	1.17	14.04	5,428.31
		12/13/2021	23.49	23.68	0.19	2.28	5,428.95
		2/8/2022	TRACE	23.23	TRACE	TRACE	5,429.25
		10/6/2022	NP	23.11	NP	NP	5,429.37
		12/16/2022	TRACE	22.64	TRACE	TRACE	5,429.84
		3/16/2023	TRACE	22.26	TRACE	TRACE	5,430.22
		5/9/2023	22.18	22.21	0.03	0.36	5,430.29



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-09	5,451.17	10/13/2017	NP	20.30	NP	NP	5,430.87
		12/21/2017	NP	20.52	NP	NP	5,430.65
		3/30/2018	NP	20.80	NP	NP	5,430.37
		6/26/2018	NP	21.21	NP	NP	5,429.96
		9/20/2018	NP	21.51	NP	NP	5,429.66
		12/13/2018	NP	21.55	NP	NP	5,429.62
		3/25/2019	NP	21.39	NP	NP	5,429.78
		6/24/2019	NP	21.59	NP	NP	5,429.58
		9/27/2019	Dry - No Product or Groundwater Observed				
		12/10/2019	NP	22.10	NP	NP	5,429.07
		3/10/2020	NP	21.79	NP	NP	5,429.38
		6/23/2020	NP	22.10	NP	NP	5,429.07
		9/28/2020	NP	22.73	NP	NP	5,428.44
		12/14/2020	NP	22.42	NP	NP	5,428.75
		3/29/2021	NP	22.11	NP	NP	5,429.06
		6/10/2021	NP	22.22	NP	NP	5,428.95
		9/23/2021	NP	21.87	NP	NP	5,429.30
		12/13/2021	NP	22.28	NP	NP	5,428.89
		2/8/2022	NP	22.03	NP	NP	5,429.14
		9/30/2022	NP	21.91	NP	NP	5,429.26
		12/16/2022	NP	21.36	NP	NP	5,429.81
MW-10	5,448.71	3/16/2023	NP	21.03	NP	NP	5,430.14
		5/9/2023	NP	20.98	NP	NP	5,430.19
		10/13/2017	NP	17.62	NP	NP	5,431.09
		12/21/2017	NP	17.75	NP	NP	5,430.96
		3/30/2018	NP	17.97	NP	NP	5,430.74
		6/26/2018	NP	18.42	NP	NP	5,430.29
		9/20/2018	NP	18.84	NP	NP	5,429.87
		12/13/2018	NP	18.74	NP	NP	5,429.97
		3/25/2019	NP	18.54	NP	NP	5,430.17
		6/24/2019	NP	18.72	NP	NP	5,429.99
		9/27/2019	NP	19.89	NP	NP	5,428.82
		12/10/2019	NP	19.19	NP	NP	5,429.52
		3/10/2020	NP	18.90	NP	NP	5,429.81
		6/23/2020	NP	19.25	NP	NP	5,429.46
		9/28/2020	NP	19.98	NP	NP	5,428.73
		12/15/2020	NP	19.55	NP	NP	5,429.16
		3/29/2021	NP	19.29	NP	NP	5,429.42
		6/10/2021	NP	19.35	NP	NP	5,429.36
		9/23/2021	NP	19.98	NP	NP	5,428.73
		12/13/2021	NP	19.34	NP	NP	5,429.37
		2/8/2022	NP	19.07	NP	NP	5,429.64
		9/30/2022	NP	18.91	NP	NP	5,429.80
		12/16/2022	NP	18.40	NP	NP	5,430.31
		3/16/2023	NP	18.08	NP	NP	5,430.63
		5/9/2023	NP	18.08	NP	NP	5,430.63



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-11	5,450.40	10/13/2017	NP	19.10	NP	NP	5,431.30
		12/21/2017	NP	19.18	NP	NP	5,431.22
		3/30/2018	NP	19.34	NP	NP	5,431.06
		6/26/2018	NP	19.83	NP	NP	5,430.57
		9/20/2018	NP	20.31	NP	NP	5,430.09
		12/13/2018	NP	20.01	NP	NP	5,430.39
		3/25/2019	NP	19.84	NP	NP	5,430.56
		6/24/2019	NP	20.82	NP	NP	5,429.58
		9/27/2019	NP	20.75	NP	NP	5,429.65
		12/10/2019	NP	20.48	NP	NP	5,429.92
		3/10/2020	NP	20.18	NP	NP	5,430.22
		6/23/2020	NP	20.55	NP	NP	5,429.85
		9/28/2020	NP	21.20	NP	NP	5,429.20
		12/15/2020	NP	20.87	NP	NP	5,429.53
		3/29/2021	NP	20.57	NP	NP	5,429.83
		6/10/2021	NP	20.62	NP	NP	5,429.78
		9/23/2021	NP	21.22	NP	NP	5,429.18
		12/13/2021	NP	20.51	NP	NP	5,429.89
		2/8/2022	NP	20.29	NP	NP	5,430.11
		9/29/2022	NP	20.12	NP	NP	5,430.28
		12/16/2022	NP	19.66	NP	NP	5,430.74
MW-12	5,452.44	3/16/2023	NP	19.33	NP	NP	5,431.07
		5/9/2023	NP	19.31	NP	NP	5,431.09
		10/13/2017	21.51	21.54	0.03	0.36	5,430.92
		12/21/2017	NP	21.81	NP	NP	5,430.63
		3/30/2018	21.91	22.71	0.80	9.60	5,430.37
		6/26/2018	22.15	23.25	1.10	13.20	5,430.07
		9/20/2018	22.50	23.65	1.15	13.80	5,429.71
		12/13/2018	22.60	23.62	1.02	12.24	5,429.64
		3/25/2019	22.50	23.35	0.85	10.20	5,429.77
		6/24/2019	22.66	23.66	1.00	12.00	5,429.58
		9/27/2019	23.39	24.42	1.03	12.36	5,428.84
		12/10/2019	23.27	23.91	0.64	7.68	5,429.04
		3/10/2020	23.02	23.42	0.40	4.80	5,429.34
		6/23/2020	23.30	23.94	0.64	7.68	5,429.01
		9/28/2020	23.75	24.40	0.65	7.80	5,428.56
		12/15/2020	23.65	24.15	0.50	6.00	5,428.69
		3/29/2021	23.42	23.54	0.12	1.44	5,429.00
		6/10/2021	23.44	23.92	0.48	5.76	5,428.90
		9/23/2021	23.96	24.31	0.35	4.20	5,428.41
		12/13/2021	23.63	23.71	0.08	0.96	5,428.79
		2/8/2022	NP	23.32	NP	NP	5,429.12
MW-13	5,452.00	10/6/2022	NP	23.20	NP	NP	5,429.24
		12/16/2022	NP	22.77	NP	NP	5,429.67
		3/16/2023	NP	22.37	NP	NP	5,430.07
		5/9/2023	22.28	22.30	0.02	0.24	5,430.16
		9/23/2021	NP	23.98	NP	NP	5,428.02
		2/8/2022	NP	23.07	NP	NP	5,428.93
MW-13	5,452.00	9/29/2022	NP	23.03	NP	NP	5,428.97
		12/16/2022	TRACE	22.52	TRACE	TRACE	5,429.48
		3/16/2023	NP	22.14	NP	NP	5,429.86
		5/9/2023	NP	22.06	NP	NP	5,429.94





<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-14	5,453.17	9/23/2021	24.85	NP	>4.04	>48.48	NM***
		12/13/2021	24.33	25.04	0.71	8.52	5,428.70
		2/8/2022	24.19	24.22	0.03	0.36	5,428.97
		10/6/2022	NP	24.02	NP	NP	5,429.15
		12/16/2022	TRACE	23.57	TRACE	TRACE	5,429.60
		3/16/2023	TRACE	23.20	TRACE	TRACE	5,429.97
		5/9/2023	23.14	23.15	0.01	0.12	5,430.03
MW-15	5,456.23	9/23/2021	NP	28.44	NP	NP	5,427.79
		12/13/2021	27.73	27.84	0.11	1.32	5,428.48
		2/8/2022	NP	27.42	NP	NP	5,428.81
		10/6/2022	NP	27.35	NP	NP	5,428.88
		12/16/2022	NP	26.86	NP	NP	5,429.37
		3/16/2023	NP	26.53	NP	NP	5,429.70
		5/9/2023	NP	26.46	NP	NP	5,429.77
MW-16	5,455.75	9/23/2021	NP	27.99	NP	NP	5,427.76
		12/13/2021	NP	27.42	NP	NP	5,428.33
		2/8/2022	NP	27.12	NP	NP	5,428.63
		9/29/2022	NP	27.08	NP	NP	5,428.67
		12/16/2022	NP	26.56	NP	NP	5,429.19
		3/16/2023	NP	26.22	NP	NP	5,429.53
		5/9/2023	NP	26.18	NP	NP	5,429.57
MW-17	5,453.21	9/23/2021	NP	25.24	NP	NP	5,427.97
		12/13/2021	NP	24.74	NP	NP	5,428.47
		2/8/2022	NP	24.32	NP	NP	5,428.89
		9/29/2022	NP	24.39	NP	NP	5,428.82
		12/16/2022	NP	23.76	NP	NP	5,429.45
		3/16/2023	NP	23.42	NP	NP	5,429.79
		5/9/2023	NP	23.33	NP	NP	5,429.88
MW-18	5,458.15	9/23/2021	30.29	30.45	0.16	1.92	5,427.83
		12/13/2021	29.76	29.83	0.07	0.84	5,428.38
		2/8/2022	NP	29.44	NP	NP	5,428.71
		10/6/2022	NP	29.38	NP	NP	5,428.77
		12/16/2022	TRACE	28.89	TRACE	TRACE	5,429.26
		3/16/2023	TRACE	28.54	TRACE	TRACE	5,429.61
		5/9/2023	TRACE	28.45	TRACE	TRACE	5,429.70
MW-19	5,455.83	9/23/2021	27.92	28.91	0.99	11.88	5,427.71
		12/13/2021	27.49	27.83	0.34	4.08	5,428.27
		2/8/2022	27.25	27.27	0.02	0.24	5,428.58
		10/6/2022	NP	27.21	NP	NP	5,428.62
		12/16/2022	TRACE	26.74	TRACE	TRACE	5,429.09
		3/16/2023	TRACE	26.38	TRACE	TRACE	5,429.45
		5/9/2023	TRACE	26.3	TRACE	TRACE	5,429.53
MW-20	5,459.33	12/13/2021	31.21	31.7	0.49	5.88	5,428.02
		2/8/2022	30.98	31.15	0.17	2.04	5,428.32
		9/30/2022	30.93	31.10	0.17	2.04	5,428.37
		12/16/2022	TRACE	30.52	TRACE	TRACE	5,428.81
		3/16/2023	30.00	30.21	0.21	2.52	5,429.12
		5/9/2023	30.02	30.05	0.03	0.36	5,429.30



<b>TABLE 3</b> <b>GROUNDWATER ELEVATIONS</b> Sullivan Gas Com D #1E Hilcorp Energy Company San Juan County, New Mexico							
Well ID	Top of Casing Elevation (feet*)	Date	Depth to Product (feet BTOC)	Depth to Groundwater (feet BTOC)	Product Thickness (feet)	Product Thickness (inches)	Groundwater Elevation (feet)
MW-21	5,457.53	12/13/2021	NP	29.44	NP	NP	5,428.09
		2/8/2022	NP	29.14	NP	NP	5,428.39
		9/30/2022	NP	29.12	NP	NP	5,428.41
		12/16/2022	NP	28.63	NP	NP	5,428.90
		3/16/2023	NP	28.33	NP	NP	5,429.20
		5/9/2023	NP	28.16	NP	NP	5,429.37
MW-22	5,463.22	12/13/2021	Dry - No Product or Groundwater Observed				
		2/8/2022	NP	37.90	NP	NP	5,425.32
		9/30/2022	Dry - No Product or Groundwater Observed				
		12/16/2022	NP	34.90	NP	NP	5,428.32
		3/16/2023	NP	35.32	NP	NP	5,427.90
		5/11/2023	NP	36.00	NP	NP	5,427.22
MW-23	5,458.66	12/13/2021	30.60	31.23	0.63	7.56	5,427.93
		2/8/2022	30.37	30.67	0.30	3.60	5,428.23
		9/30/2022	30.35	30.61	0.26	3.12	5,428.26
		12/16/2022	TRACE	29.93	TRACE	TRACE	5,428.73
		3/16/2023	29.60	29.67	0.07	0.84	5,429.05
		5/11/2023	29.47	29.5	0.03	0.36	5,429.18
MW-24	5,465.96	5/11/2023	TRACE	36.91	TRACE	TRACE	5,429.05
MW-25	5,466.95	5/11/2023	NP	37.94	NP	NP	5,429.01
MW-26	5,462.02	5/11/2023	NP	32.95	NP	NP	5,429.07
MW-27	5,462.65	5/11/2023	NP	33.66	NP	NP	5,428.99
MW-28	5,465.90	5/11/2023	NP	36.96	NP	NP	5,428.94

**Notes:**

\*: surveyed using North American Vertical Datum 1988 geoid 12B in U.S. survey feet

\*\*: Estimated based on volume recovered in a bailer

\*\*\*: Elevation could not be determined due to no groundwater present in monitoring well

---: not measured

NP: not present

Trace: visible sheen/product in bailer, but not detected by interface probe

A product density correction factor of 0.7996 was applied to the groundwater elevation in wells that contained free product.



**TABLE 4**  
**GROUNDWATER ANALYTICAL RESULTS**

Sullivan Gas Com D#1E  
Hilcorp Energy Company  
San Juan County, New Mexico

Well ID	Date Sampled (1)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard		5	1,000	700	620
PR-1	9/25/2017	3,580	19,500	<100	82,700
	3/25/2019	18	650	130	4,200
	3/11/2020	8.0	340	73	3,200
	3/29/2021	13	94	67	4,800
	6/10/2021	9.0	35	26	1,600
	9/29/2022	<4.0	<4.0	52	2,700
	3/16/2023	<5.0	<10	24	1,300
PR-2	10/13/2017	2,070	6,450	555	6,900
	6/27/2018	1,100	810	400	2,100
	9/20/2018	1,100	1,200	430	2,100
	12/13/2018	1,900	3,600	840	4,300
	3/25/2019	65	41	120	270
	6/24/2019	170	180	130	390
	9/27/2019	170	230	180	690
	12/14/2021	7.5	28	57	830
	9/29/2022	25	9.1	82	1,500
	5/09/2023	2.9	<2.0	12	29
MW-01	9/25/2017	415	1,990	222	8,270
	12/16/2022	<2.5	11	19	400
MW-02	9/10/2015	6,500	24,200	1,770	11,400
	12/15/2016	2,730	5,960	440	9,450
	6/27/2018	220	820	<100	5,500
	3/25/2019	<10	<10	13	2,500
	3/10/2020	<10	14	12	3,400
	10/06/2022	<10	<10	59	670
	3/16/2023	<8.0	<8.0	<8.0	63
MW-03	9/10/2015	2,050	420	390	2,890
	9/14/2015	6,800	1,800	900	7,600
	2/19/2016	919	232	130	830
	12/15/2016	1,440	251	283	2,810
	6/28/2017	334	146	117	1,260
	6/27/2018	<10	<10	<10	<15



**TABLE 4**  
**GROUNDWATER ANALYTICAL RESULTS**

Sullivan Gas Com D#1E  
Hilcorp Energy Company  
San Juan County, New Mexico

Well ID	Date Sampled (1)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard		5	1,000	700	620
MW-03	9/20/2018	<1.0	<1.0	<1.0	<2.0
	12/13/2018	<1.0	<1.0	<1.0	<2.0
	3/25/2019	<1.0	<1.0	<1.0	<1.5
	6/24/2019	<1.0	<1.0	<1.0	<2.0
	12/10/2019	<1.0	<1.0	<1.0	<2.0
	3/10/2020	<1.0	<1.0	<1.0	<1.5
	12/15/2020	<1.0	<1.0	<1.0	<2.0
	3/29/2021	<1.0	<1.0	<1.0	<1.5
	9/29/2022	<1.0	<1.0	<1.0	<1.5
	12/16/2022	<1.0	<1.0	<1.0	2.4
	3/17/2023	<1.0	<1.0	<1.0	<2.0
	5/09/2023	<1.0	<1.0	<1.0	<2.0
MW-04	9/10/2015	3,480	30	60	180
	9/14/2015	2,900	25	110	290
	2/19/2016	<0.5	<5.0	<0.5	<1.50
	6/20/2016	1,680	<50.0	297	2,210
	9/30/2016	630	72	94	640
	12/15/2016	1,520	15.8	17.3	166
	6/28/2017	24	154	67.2	2,350
	6/27/2018	<10	<10	<10	<15
MW-05	12/15/2016	2,440	6,700	638	8,470
	3/11/2020	44	100	8.0	270
	3/30/2021	220	970	190	6,200
	10/06/2022	210	690	280	4,300
	3/16/2023	350	440	190	6,100
MW-06	12/15/2016	1,810	3,640	811	14,200
	9/25/2017	1,450	3,840	271	7,970
	6/27/2018	<10	93	46	840
	9/20/2018	170	2,200	970	18,000
	12/13/2018	57	1,500	660	11,000
	3/25/2019	57	1,200	750	12,000
	6/24/2019	120	1,800	870	14,000
	12/10/2019	76	1,200	620	11,000
	3/10/2020	150	2,300	880	13,000
	6/23/2020	120	1,900	850	18,000
	9/28/2020	110	1,800	990	13,000
	12/15/2020	140	2,400	1,400	16,000



**TABLE 4**  
**GROUNDWATER ANALYTICAL RESULTS**

Sullivan Gas Com D#1E  
Hilcorp Energy Company  
San Juan County, New Mexico

Well ID	Date Sampled (1)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard		5	1,000	700	620
MW-06	3/29/2021	21	310	340	2,500
	6/10/2021	54	340	480	5,500
	9/29/2022	240	2,900	1,100	16,000
	12/16/2022	170	3,200	1,700	21,000
	3/16/2023	30	760	560	7,500
MW-07	6/27/2018	<1.0	<1.0	<1.0	<1.5
	9/20/2018	<2.0	<2.0	<2.0	<4.0
	12/13/2018	<1.0	<1.0	<1.0	<2.0
	3/25/2019	<2.0	<2.0	<2.0	<3.0
	6/24/2019	<2.0	<2.0	<2.0	<4.0
	9/27/2019	<1.0	<1.0	<1.0	<2.0
	12/10/2019	<1.0	<1.0	<1.0	<2.0
	3/11/2020	<1.0	<1.0	<1.0	<1.5
	6/23/2020	<1.0	<1.0	<1.0	<1.5
	9/28/2020	<1.0	<1.0	<1.0	<1.5
	12/15/2020	<1.0	<1.0	<1.0	<2.0
	3/29/2021	<1.0	<1.0	<1.0	<1.5
	6/10/2021	<1.0	<1.0	<1.0	<1.5
	9/23/2021	<1.0	<1.0	<1.0	<2.0
	12/14/2021	<1.0	<1.0	<1.0	<2.0
	3/10/2022	<1.0	<1.0	<1.0	<1.5
	9/29/2022	<1.0	<1.0	<1.0	<1.5
	12/16/2022	<1.0	<1.0	<1.0	<1.5
	3/16/2023	<1.0	<1.0	<1.0	<2.0
	5/09/2023	<1.0	<1.0	<1.0	<2.0
MW-08	10/06/2022	290	850	210	3,400
MW-09	10/13/2017	0.9	4.51	<0.5	8.98
	6/27/2018	<1.0	<1.0	<1.0	<1.5
	9/20/2018	<1.0	<1.0	<1.0	<2.0
	12/13/2018	<1.0	<1.0	<1.0	<2.0
	3/25/2019	<1.0	<1.0	<1.0	<1.5
	6/24/2019	<1.0	<1.0	<1.0	<1.5
	12/17/2019	<1.0	<1.0	<1.0	<2.0
	3/11/2020	<1.0	<1.0	<1.0	<1.5
	6/23/2020	<1.0	<1.0	<1.0	<1.5
	9/28/2020	<1.0	<1.0	<1.0	<1.5
	12/14/2020	<1.0	<1.0	<1.0	<2.0



**TABLE 4**  
**GROUNDWATER ANALYTICAL RESULTS**

Sullivan Gas Com D#1E  
Hilcorp Energy Company  
San Juan County, New Mexico

Well ID	Date Sampled (1)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard		5	1,000	700	620
MW-09	3/29/2021	<1.0	<1.0	<1.0	<1.5
	6/10/2021	<1.0	<1.0	<1.0	<1.5
	9/23/2021	<1.0	<1.0	<1.0	<2.0
	12/14/2021	<1.0	<1.0	<1.0	<2.0
	3/10/2022	<1.0	<1.1	<1.2	<1.5
	12/16/2022	<1.0	<1.1	<1.2	<1.5
	3/17/2023	<1.0	<1.0	<1.0	<2.0
	5/09/2023	<1.0	<1.0	<1.0	<2.0
MW-10	10/13/2017	<0.5	2.28	<0.5	3.33
	6/27/2018	<1.0	<1.0	<1.0	<1.5
	9/20/2018	<1.0	<1.0	<1.0	<2.0
	12/13/2018	<1.0	<1.0	<1.0	<2.0
	3/25/2019	<1.0	<1.0	<1.0	<1.5
	6/24/2019	<1.0	<1.0	<1.0	<2.0
	9/27/2019	<1.0	<1.0	<1.0	<2.0
	12/10/2019	<1.0	<1.0	<1.0	<2.0
	3/11/2020	<1.0	<1.0	<1.0	<1.5
	6/23/2020	<1.0	<1.0	<1.0	<1.5
	9/28/2020	<1.0	<1.0	<1.0	<1.5
	12/15/2020	<1.0	<1.0	<1.0	<2.0
	3/29/2021	<1.0	<1.0	<1.0	<1.5
	6/10/2021	<1.0	<1.0	<1.0	<1.5
	9/23/2021	<1.0	<1.0	<1.0	<2.0
	12/14/2021	<1.0	<1.0	<1.0	<2.0
	3/10/2022	<1.0	<1.0	<1.0	<1.5
	9/30/2022	<1.0	<1.0	<1.0	<1.5
	12/16/2022	<1.0	<1.0	<1.0	<1.5
	3/17/2023	<1.0	<1.0	<1.0	<2.0
	5/09/2023	<1.0	<1.0	<1.0	<2.0
MW-11	10/13/2017	<0.5	<1.0	<0.5	<1.5
	6/27/2018	<1.0	<1.0	<1.0	<1.5
	9/20/2018	<1.0	<1.0	<1.0	<2.0
	12/13/2018	<1.0	<1.0	<1.0	<2.0
	3/25/2019	<1.0	<1.0	<1.0	<1.5
	6/24/2019	<1.0	<1.0	<1.0	<2.0
	9/27/2019	<1.0	<1.0	<1.0	<2.0
	12/10/2019	<1.0	<1.0	<1.0	<2.0



**TABLE 4**  
**GROUNDWATER ANALYTICAL RESULTS**

Sullivan Gas Com D#1E  
Hilcorp Energy Company  
San Juan County, New Mexico

Well ID	Date Sampled (1)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard		5	1,000	700	620
MW-11	3/11/2020	<1.0	<1.0	<1.0	<1.5
	6/23/2020	<1.0	<1.0	<1.0	<1.5
	9/28/2020	<1.0	<1.0	<1.0	<1.5
	12/15/2020	<1.0	<1.0	<1.0	<2.0
	3/29/2021	<1.0	<1.0	<1.0	<1.5
	6/10/2021	<1.0	<1.0	<1.0	<1.5
	9/23/2021	<1.0	<1.0	<1.0	<2.0
	12/14/2021	<1.0	<1.0	<1.0	<2.0
	3/10/2022	<1.0	<1.0	<1.0	<1.5
	9/29/2022	<1.0	<1.0	<1.0	<1.5
	12/16/2022	<1.0	<1.0	<1.0	<1.5
	3/17/2023	<1.0	<1.0	<1.0	<2.0
	5/09/2023	<1.0	<1.0	<1.0	<2.0
MW-12	10/06/2022	760	330	150	7,700
	3/16/2023	470	58	100	3,200
MW-13	9/24/2021	23	<5.0	54	750
	3/11/2022	22	5.9	58	3,300
	9/29/2022	16	<5.0	130	840
	3/16/2023	4.3	<5.0	33	110
	5/09/2023	5.3	<2.0	17	47
MW-14	10/06/2022	1,900	7,300	890	17,000
MW-15	9/24/2021	5.2	<5.0	120	1,100
	3/11/2022	8.6	29	630	7,400
	10/06/2022	12	63	390	3,100
	12/16/2022	<2.5	7.0	130	550
	3/16/2023	<1.0	2.8	49	200
	5/09/2023	<2.0	8.1	210	850
MW-16	9/23/2021	<1.0	<1.0	<1.0	<2.0
	3/11/2022	<1.0	<1.0	<1.0	<1.5
	9/29/2022	<1.0	<1.0	<1.0	<1.5
	12/16/2022	<1.0	<1.0	<1.0	<1.5
	3/16/2023	<1.0	<1.0	<1.0	<1.5
	5/09/2023	<1.0	<1.0	<1.0	<2.0





**TABLE 4**  
**GROUNDWATER ANALYTICAL RESULTS**

Sullivan Gas Com D#1E  
Hilcorp Energy Company  
San Juan County, New Mexico

Well ID	Date Sampled (1)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard		5	1,000	700	620
MW-17	9/23/2021	<1.0	<1.0	<1.0	<2.0
	12/14/2021	<1.0	<1.0	<1.0	<2.0
	3/11/2022	<1.0	<1.0	<1.0	<1.5
	9/29/2022	<1.0	<1.0	<1.0	<1.5
	12/16/2022	<1.0	<1.0	<1.0	<2.0
	3/16/2023	<1.0	<1.0	<1.0	<2.0
	5/09/2023	<1.0	<1.0	<1.0	<2.0
MW-18	10/06/2022	1,900	1,300	1,000	10,000
MW-19	10/06/2022	1,100	240	900	8,200
MW-21	10/12/2021	<1.0	<1.0	<1.0	<1.5
	12/14/2021	<1.0	<1.0	<1.0	<2.0
	3/11/2022	<1.0	<1.0	<1.0	<1.5
	9/30/2022	<1.0	<1.0	<1.0	<1.5
	12/16/2022	<1.0	11	11	190
	3/17/2023	<1.0	<1.0	<1.0	<2.0
	5/11/2023	<1.0	<1.0	<1.0	<2.0
MW-22	12/16/2022	35	<2.5	<2.5	<5.0
	3/17/2023	13	<5.0	<5.0	14
	5/11/2023	5.6	<2.5	<2.5	11
MW-25	5/11/2023	56	180	330	4,200
MW-26	5/11/2023	<1.0	<1.0	<1.0	<2.0
MW-27	5/11/2023	<1.0	<1.0	<1.0	<2.0
MW-28	5/11/2023	<1.0	<1.0	<1.0	<2.0

**Notes:**

(1): wells with measurable phase separated hydrocarbons and/or dry were not sampled for laboratory analysis

µg/L: micrograms per liter

ND: not detected, practical quantitation limit unknown

NMWQCC: New Mexico Water Quality Control Commission

<: indicates result less than the stated laboratory reporting limit (PQL)

Concentrations in **bold** and shaded exceed the New Mexico Water Quality Control Commission Standards, 20.6.2 of the New Mexico Administrative Code



**TABLE 5**  
**SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS**  
 Sullivan Gas Com D #1E  
 Hilcorp Energy Company  
 San Juan County, New Mexico

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)	Oxygen (%)	Carbon Dioxide (%)
4/18/2016	--	840	1,900	87	840	140,000	--	--
4/20/2016	2,375	840	1,900	87	840	140,000	--	--
4/29/2017	3,520	280	1,000	64	630	65,000	--	--
8/11/2016	4,215	92	700	90	910	23,000	--	--
1/24/2018	2,837	46	140	<5.0	410	21,000	--	--
6/29/2018	3,000	63	210	<5.0	410	27,000	--	--
12/2/2021	741	15	<5.0	<5.0	99	33,000	--	--
3/16/2022	982	<0.10	<0.10	<0.10	1.1	64	19.40	1.23
6/17/2022	327	<0.10	<0.10	<0.10	0.25	10	21.54	0.29
9/22/2022	266	<0.10	<0.10	<0.10	<0.15	<5.0	20.57	1.00
12/10/2022	68	0.75	4.9	0.49	9.0	490	21.02	0.65
3/13/2023	69	0.81	4.4	0.30	5.7	300	21.15	0.51
6/23/2023	139	5.9	12	3.0	6.7	840	21.01	0.55

**Notes:**

GRO: gasoline range hydrocarbons

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

%: percent

--: not sampled

&lt;0.037: gray indicates result less than the stated laboratory reporting limit (RL)



## APPENDIX A

### Soil Laboratory Analytical Reports

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Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

October 07, 2021

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

RE: Sullivan GC D 1E

OrderNo.: 2109D91

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 26 sample(s) on 9/24/2021 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW17 @ 10-15'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 9:46:00 AM

Lab ID: 2109D91-001

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/29/2021 12:52:23 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/29/2021 12:52:23 PM
Surr: DNOP	96.9	70-130		%Rec	1	9/29/2021 12:52:23 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/27/2021 10:23:12 PM
Surr: BFB	102	70-130		%Rec	1	9/27/2021 10:23:12 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.025		mg/Kg	1	9/27/2021 10:23:12 PM
Toluene	ND	0.049		mg/Kg	1	9/27/2021 10:23:12 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/27/2021 10:23:12 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/27/2021 10:23:12 PM
Surr: 4-Bromofluorobenzene	87.0	70-130		%Rec	1	9/27/2021 10:23:12 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	470	61		mg/Kg	20	10/5/2021 12:33:53 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW17 @ 24-25'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 9:50:00 AM

Lab ID: 2109D91-002

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	9/29/2021 1:16:54 PM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	9/29/2021 1:16:54 PM
Surr: DNOP	88.6	70-130		%Rec	1	9/29/2021 1:16:54 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/27/2021 11:34:07 PM
Surr: BFB	104	70-130		%Rec	1	9/27/2021 11:34:07 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	9/27/2021 11:34:07 PM
Toluene	ND	0.047		mg/Kg	1	9/27/2021 11:34:07 PM
Ethylbenzene	ND	0.047		mg/Kg	1	9/27/2021 11:34:07 PM
Xylenes, Total	ND	0.094		mg/Kg	1	9/27/2021 11:34:07 PM
Surr: 4-Bromofluorobenzene	90.7	70-130		%Rec	1	9/27/2021 11:34:07 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW17 @ 30'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 9:48:00 AM

Lab ID: 2109D91-003

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	9/29/2021 1:29:20 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/29/2021 1:29:20 PM
Surr: DNOP	90.1	70-130		%Rec	1	9/29/2021 1:29:20 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/27/2021 11:57:39 PM
Surr: BFB	104	70-130		%Rec	1	9/27/2021 11:57:39 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	9/27/2021 11:57:39 PM
Toluene	ND	0.049		mg/Kg	1	9/27/2021 11:57:39 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/27/2021 11:57:39 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/27/2021 11:57:39 PM
Surr: 4-Bromofluorobenzene	90.4	70-130		%Rec	1	9/27/2021 11:57:39 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SB17 @ 5-10'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 11:46:00 AM

Lab ID: 2109D91-004

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	9/29/2021 1:41:37 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/29/2021 1:41:37 PM
Surr: DNOP	78.8	70-130		%Rec	1	9/29/2021 1:41:37 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/28/2021 12:21:08 AM
Surr: BFB	104	70-130		%Rec	1	9/28/2021 12:21:08 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.023		mg/Kg	1	9/28/2021 12:21:08 AM
Toluene	ND	0.046		mg/Kg	1	9/28/2021 12:21:08 AM
Ethylbenzene	ND	0.046		mg/Kg	1	9/28/2021 12:21:08 AM
Xylenes, Total	ND	0.092		mg/Kg	1	9/28/2021 12:21:08 AM
Surr: 4-Bromofluorobenzene	90.7	70-130		%Rec	1	9/28/2021 12:21:08 AM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/5/2021 1:11:06 AM

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

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

## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SB17 @ 25-30'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 11:48:00 AM

Lab ID: 2109D91-005

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/29/2021 1:53:57 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 1:53:57 PM
Surr: DNOP	96.9	70-130		%Rec	1	9/29/2021 1:53:57 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/28/2021 12:44:37 AM
Surr: BFB	105	70-130		%Rec	1	9/28/2021 12:44:37 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	9/28/2021 12:44:37 AM
Toluene	ND	0.047		mg/Kg	1	9/28/2021 12:44:37 AM
Ethylbenzene	ND	0.047		mg/Kg	1	9/28/2021 12:44:37 AM
Xylenes, Total	ND	0.094		mg/Kg	1	9/28/2021 12:44:37 AM
Surr: 4-Bromofluorobenzene	92.0	70-130		%Rec	1	9/28/2021 12:44:37 AM

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

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

## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SB17 @ 30-35'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 11:54:00 AM

Lab ID: 2109D91-006

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/29/2021 2:06:25 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/29/2021 2:06:25 PM
Surr: DNOP	81.3	70-130		%Rec	1	9/29/2021 2:06:25 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/28/2021 1:08:08 AM
Surr: BFB	104	70-130		%Rec	1	9/28/2021 1:08:08 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.023		mg/Kg	1	9/28/2021 1:08:08 AM
Toluene	ND	0.046		mg/Kg	1	9/28/2021 1:08:08 AM
Ethylbenzene	ND	0.046		mg/Kg	1	9/28/2021 1:08:08 AM
Xylenes, Total	ND	0.091		mg/Kg	1	9/28/2021 1:08:08 AM
Surr: 4-Bromofluorobenzene	90.6	70-130		%Rec	1	9/28/2021 1:08:08 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW18 @ 20-22'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 3:41:00 PM

Lab ID: 2109D91-007

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/29/2021 2:18:43 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/29/2021 2:18:43 PM
Surr: DNOP	85.3	70-130		%Rec	1	9/29/2021 2:18:43 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/28/2021 1:31:42 AM
Surr: BFB	104	70-130		%Rec	1	9/28/2021 1:31:42 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	9/28/2021 1:31:42 AM
Toluene	ND	0.047		mg/Kg	1	9/28/2021 1:31:42 AM
Ethylbenzene	ND	0.047		mg/Kg	1	9/28/2021 1:31:42 AM
Xylenes, Total	ND	0.095		mg/Kg	1	9/28/2021 1:31:42 AM
Surr: 4-Bromofluorobenzene	89.8	70-130		%Rec	1	9/28/2021 1:31:42 AM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	65	61		mg/Kg	20	10/5/2021 10:04:59 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW18 @ 22-25'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 3:42:00 PM

Lab ID: 2109D91-008

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	15	9.3		mg/Kg	1	9/29/2021 3:20:16 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/29/2021 3:20:16 PM
Surr: DNOP	86.3	70-130		%Rec	1	9/29/2021 3:20:16 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/28/2021 1:55:15 AM
Surr: BFB	118	70-130		%Rec	1	9/28/2021 1:55:15 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	9/28/2021 1:55:15 AM
Toluene	ND	0.048		mg/Kg	1	9/28/2021 1:55:15 AM
Ethylbenzene	ND	0.048		mg/Kg	1	9/28/2021 1:55:15 AM
Xylenes, Total	0.11	0.097		mg/Kg	1	9/28/2021 1:55:15 AM
Surr: 4-Bromofluorobenzene	91.7	70-130		%Rec	1	9/28/2021 1:55:15 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW18 @ 30-35'

Project: Sullivan GC D 1E

Collection Date: 9/21/2021 3:40:00 PM

Lab ID: 2109D91-009

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/29/2021 3:32:37 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 3:32:37 PM
Surr: DNOP	82.6	70-130		%Rec	1	9/29/2021 3:32:37 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/28/2021 2:18:49 AM
Surr: BFB	102	70-130		%Rec	1	9/28/2021 2:18:49 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.023		mg/Kg	1	9/28/2021 2:18:49 AM
Toluene	ND	0.046		mg/Kg	1	9/28/2021 2:18:49 AM
Ethylbenzene	ND	0.046		mg/Kg	1	9/28/2021 2:18:49 AM
Xylenes, Total	ND	0.092		mg/Kg	1	9/28/2021 2:18:49 AM
Surr: 4-Bromofluorobenzene	88.9	70-130		%Rec	1	9/28/2021 2:18:49 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW14 @ 35-40

Project: Sullivan GC D 1E

Collection Date: 9/18/2021 4:30:00 PM

Lab ID: 2109D91-010

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/29/2021 3:44:56 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/29/2021 3:44:56 PM
Surr: DNOP	84.4	70-130		%Rec	1	9/29/2021 3:44:56 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/28/2021 2:42:17 AM
Surr: BFB	106	70-130		%Rec	1	9/28/2021 2:42:17 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.023		mg/Kg	1	9/28/2021 2:42:17 AM
Toluene	ND	0.047		mg/Kg	1	9/28/2021 2:42:17 AM
Ethylbenzene	ND	0.047		mg/Kg	1	9/28/2021 2:42:17 AM
Xylenes, Total	ND	0.094		mg/Kg	1	9/28/2021 2:42:17 AM
Surr: 4-Bromofluorobenzene	91.1	70-130		%Rec	1	9/28/2021 2:42:17 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW14 @ 20-21'

Project: Sullivan GC D 1E

Collection Date: 9/18/2021 3:45:00 PM

Lab ID: 2109D91-011

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: JME
Diesel Range Organics (DRO)	830	86		mg/Kg	10	10/1/2021 10:11:55 AM
Motor Oil Range Organics (MRO)	ND	430	D	mg/Kg	10	10/1/2021 10:11:55 AM
Surr: DNOP	0	70-130	S	%Rec	10	10/1/2021 10:11:55 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: NSB
Gasoline Range Organics (GRO)	2800	230		mg/Kg	50	9/28/2021 9:05:32 AM
Surr: BFB	310	70-130	S	%Rec	50	9/28/2021 9:05:32 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: NSB
Benzene	0.44	0.023		mg/Kg	1	9/28/2021 3:05:42 AM
Toluene	15	2.3		mg/Kg	50	9/28/2021 9:05:32 AM
Ethylbenzene	8.6	2.3		mg/Kg	50	9/28/2021 9:05:32 AM
Xylenes, Total	150	4.6		mg/Kg	50	9/28/2021 9:05:32 AM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	50	9/28/2021 9:05:32 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW14 @ 10-15'

Project: Sullivan GC D 1E

Collection Date: 9/18/2021 3:40:00 PM

Lab ID: 2109D91-012

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/29/2021 11:08:51 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 11:08:51 AM
Surr: DNOP	94.1	70-130		%Rec	1	9/29/2021 11:08:51 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/28/2021 3:53:00 AM
Surr: BFB	131	70-130	S	%Rec	1	9/28/2021 3:53:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	9/28/2021 3:53:00 AM
Toluene	ND	0.047		mg/Kg	1	9/28/2021 3:53:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	9/28/2021 3:53:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	9/28/2021 3:53:00 AM
Surr: 4-Bromofluorobenzene	87.8	70-130		%Rec	1	9/28/2021 3:53:00 AM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	88	60		mg/Kg	20	10/5/2021 10:17:24 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW16 @ 0-5'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 5:18:00 PM

Lab ID: 2109D91-013

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/29/2021 12:20:18 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 12:20:18 PM
Surr: DNOP	96.2	70-130		%Rec	1	9/29/2021 12:20:18 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/28/2021 4:16:33 AM
Surr: BFB	109	70-130		%Rec	1	9/28/2021 4:16:33 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.023		mg/Kg	1	9/28/2021 4:16:33 AM
Toluene	ND	0.046		mg/Kg	1	9/28/2021 4:16:33 AM
Ethylbenzene	ND	0.046		mg/Kg	1	9/28/2021 4:16:33 AM
Xylenes, Total	ND	0.092		mg/Kg	1	9/28/2021 4:16:33 AM
Surr: 4-Bromofluorobenzene	87.1	70-130		%Rec	1	9/28/2021 4:16:33 AM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/5/2021 10:54:38 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW16 @ 25-30'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 5:16:00 PM

Lab ID: 2109D91-014

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/29/2021 12:44:09 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 12:44:09 PM
Surr: DNOP	92.3	70-130		%Rec	1	9/29/2021 12:44:09 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/28/2021 4:40:13 AM
Surr: BFB	107	70-130		%Rec	1	9/28/2021 4:40:13 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.025		mg/Kg	1	9/28/2021 4:40:13 AM
Toluene	ND	0.049		mg/Kg	1	9/28/2021 4:40:13 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/28/2021 4:40:13 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/28/2021 4:40:13 AM
Surr: 4-Bromofluorobenzene	89.3	70-130		%Rec	1	9/28/2021 4:40:13 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW16 @ 30-35'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 5:14:00 PM

Lab ID: 2109D91-015

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/29/2021 1:08:01 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/29/2021 1:08:01 PM
Surr: DNOP	95.9	70-130		%Rec	1	9/29/2021 1:08:01 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/28/2021 9:29:14 AM
Surr: BFB	107	70-130		%Rec	1	9/28/2021 9:29:14 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	9/28/2021 9:29:14 AM
Toluene	ND	0.048		mg/Kg	1	9/28/2021 9:29:14 AM
Ethylbenzene	ND	0.048		mg/Kg	1	9/28/2021 9:29:14 AM
Xylenes, Total	ND	0.096		mg/Kg	1	9/28/2021 9:29:14 AM
Surr: 4-Bromofluorobenzene	90.2	70-130		%Rec	1	9/28/2021 9:29:14 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW13 @ 5-10'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 4:10:00 PM

Lab ID: 2109D91-016

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	9/29/2021 1:31:53 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/29/2021 1:31:53 PM
Surr: DNOP	114	70-130		%Rec	1	9/29/2021 1:31:53 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/27/2021 7:45:00 PM
Surr: BFB	94.6	70-130		%Rec	1	9/27/2021 7:45:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	9/27/2021 7:45:00 PM
Toluene	ND	0.049		mg/Kg	1	9/27/2021 7:45:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/27/2021 7:45:00 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/27/2021 7:45:00 PM
Surr: 4-Bromofluorobenzene	78.3	70-130		%Rec	1	9/27/2021 7:45:00 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/5/2021 11:07:02 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW13 @ 26'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 4:11:00 PM

Lab ID: 2109D91-017

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	8.1		mg/Kg	1	9/29/2021 1:55:43 PM
Motor Oil Range Organics (MRO)	ND	40		mg/Kg	1	9/29/2021 1:55:43 PM
Surr: DNOP	90.9	70-130		%Rec	1	9/29/2021 1:55:43 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	170	46		mg/Kg	10	9/28/2021 2:40:00 PM
Surr: BFB	186	70-130	S	%Rec	10	9/28/2021 2:40:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.023		mg/Kg	1	9/27/2021 8:44:00 PM
Toluene	ND	0.046		mg/Kg	1	9/27/2021 8:44:00 PM
Ethylbenzene	0.48	0.046		mg/Kg	1	9/27/2021 8:44:00 PM
Xylenes, Total	3.7	0.093		mg/Kg	1	9/27/2021 8:44:00 PM
Surr: 4-Bromofluorobenzene	116	70-130		%Rec	1	9/27/2021 8:44:00 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW13 @ 30-35'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 4:09:00 PM

Lab ID: 2109D91-018

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/29/2021 2:19:33 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 2:19:33 PM
Surr: DNOP	92.3	70-130		%Rec	1	9/29/2021 2:19:33 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/27/2021 9:43:00 PM
Surr: BFB	108	70-130		%Rec	1	9/27/2021 9:43:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	9/27/2021 9:43:00 PM
Toluene	ND	0.047		mg/Kg	1	9/27/2021 9:43:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	9/27/2021 9:43:00 PM
Xylenes, Total	ND	0.094		mg/Kg	1	9/27/2021 9:43:00 PM
Surr: 4-Bromofluorobenzene	80.7	70-130		%Rec	1	9/27/2021 9:43:00 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW15 @ 20-25'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 3:38:00 PM

Lab ID: 2109D91-019

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/29/2021 3:31:08 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/29/2021 3:31:08 PM
Surr: DNOP	91.6	70-130		%Rec	1	9/29/2021 3:31:08 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/27/2021 10:03:00 PM
Surr: BFB	115	70-130		%Rec	1	9/27/2021 10:03:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.025		mg/Kg	1	9/27/2021 10:03:00 PM
Toluene	ND	0.049		mg/Kg	1	9/27/2021 10:03:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/27/2021 10:03:00 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/27/2021 10:03:00 PM
Surr: 4-Bromofluorobenzene	81.4	70-130		%Rec	1	9/27/2021 10:03:00 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/5/2021 11:19:27 PM

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

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

## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW15 @ 26'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 4:00:00 PM

Lab ID: 2109D91-020

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	42	9.7		mg/Kg	1	9/29/2021 3:54:56 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 3:54:56 PM
Surr: DNOP	93.9	70-130		%Rec	1	9/29/2021 3:54:56 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	490	100		mg/Kg	20	9/28/2021 2:59:00 PM
Surr: BFB	220	70-130	S	%Rec	20	9/28/2021 2:59:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.025		mg/Kg	1	9/27/2021 10:22:00 PM
Toluene	ND	0.050		mg/Kg	1	9/27/2021 10:22:00 PM
Ethylbenzene	1.9	0.050		mg/Kg	1	9/27/2021 10:22:00 PM
Xylenes, Total	17	2.0		mg/Kg	20	9/28/2021 2:59:00 PM
Surr: 4-Bromofluorobenzene	168	70-130	S	%Rec	1	9/27/2021 10:22:00 PM

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

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

## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW15 @ 30-35'

Project: Sullivan GC D 1E

Collection Date: 9/20/2021 3:37:00 PM

Lab ID: 2109D91-021

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/29/2021 4:52:29 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/29/2021 4:52:29 PM
Surr: DNOP	71.9	70-130		%Rec	1	9/29/2021 4:52:29 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/28/2021 3:19:00 PM
Surr: BFB	101	70-130		%Rec	1	9/28/2021 3:19:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	9/27/2021 10:42:00 PM
Toluene	ND	0.048		mg/Kg	1	9/27/2021 10:42:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/27/2021 10:42:00 PM
Xylenes, Total	ND	0.096		mg/Kg	1	9/27/2021 10:42:00 PM
Surr: 4-Bromofluorobenzene	86.4	70-130		%Rec	1	9/27/2021 10:42:00 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SB18 @ 25-30'

Project: Sullivan GC D 1E

Collection Date: 9/22/2021 11:55:00 AM

Lab ID: 2109D91-022

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/29/2021 5:16:18 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 5:16:18 PM
Surr: DNOP	64.1	70-130	S	%Rec	1	9/29/2021 5:16:18 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/27/2021 11:02:00 PM
Surr: BFB	96.0	70-130		%Rec	1	9/27/2021 11:02:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	9/27/2021 11:02:00 PM
Toluene	ND	0.047		mg/Kg	1	9/27/2021 11:02:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	9/27/2021 11:02:00 PM
Xylenes, Total	ND	0.095		mg/Kg	1	9/27/2021 11:02:00 PM
Surr: 4-Bromofluorobenzene	82.2	70-130		%Rec	1	9/27/2021 11:02:00 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/5/2021 11:31:52 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SB18 @ 30-35'

Project: Sullivan GC D 1E

Collection Date: 9/22/2021 12:01:00 PM

Lab ID: 2109D91-023

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/29/2021 5:40:11 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/29/2021 5:40:11 PM
Surr: DNOP	77.9	70-130		%Rec	1	9/29/2021 5:40:11 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/27/2021 11:21:00 PM
Surr: BFB	98.9	70-130		%Rec	1	9/27/2021 11:21:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.023		mg/Kg	1	9/27/2021 11:21:00 PM
Toluene	ND	0.046		mg/Kg	1	9/27/2021 11:21:00 PM
Ethylbenzene	ND	0.046		mg/Kg	1	9/27/2021 11:21:00 PM
Xylenes, Total	ND	0.092		mg/Kg	1	9/27/2021 11:21:00 PM
Surr: 4-Bromofluorobenzene	81.3	70-130		%Rec	1	9/27/2021 11:21:00 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW19 @ 20-25'

Project: Sullivan GC D 1E

Collection Date: 9/22/2021 10:10:00 AM

Lab ID: 2109D91-024

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/29/2021 6:04:02 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/29/2021 6:04:02 PM
Surr: DNOP	80.6	70-130		%Rec	1	9/29/2021 6:04:02 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/27/2021 11:41:00 PM
Surr: BFB	104	70-130		%Rec	1	9/27/2021 11:41:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	9/27/2021 11:41:00 PM
Toluene	ND	0.048		mg/Kg	1	9/27/2021 11:41:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/27/2021 11:41:00 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/27/2021 11:41:00 PM
Surr: 4-Bromofluorobenzene	80.5	70-130		%Rec	1	9/27/2021 11:41:00 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/5/2021 11:44:17 PM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW19 @ 25-30'

Project: Sullivan GC D 1E

Collection Date: 9/22/2021 10:15:00 AM

Lab ID: 2109D91-025

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	290	9.1		mg/Kg	1	9/29/2021 6:27:56 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/29/2021 6:27:56 PM
Surr: DNOP	79.6	70-130		%Rec	1	9/29/2021 6:27:56 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>CCM</b>
Gasoline Range Organics (GRO)	820	49		mg/Kg	10	9/29/2021 6:40:00 PM
Surr: BFB	269	70-130	S	%Rec	10	9/29/2021 6:40:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.025		mg/Kg	1	9/28/2021 12:01:00 AM
Toluene	0.88	0.049		mg/Kg	1	9/28/2021 12:01:00 AM
Ethylbenzene	3.3	0.049		mg/Kg	1	9/28/2021 12:01:00 AM
Xylenes, Total	42	0.99		mg/Kg	10	9/29/2021 6:40:00 PM
Surr: 4-Bromofluorobenzene	207	70-130	S	%Rec	1	9/28/2021 12:01:00 AM

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

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

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## Analytical Report

Lab Order 2109D91

Date Reported: 10/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW19 @ 35'

Project: Sullivan GC D 1E

Collection Date: 9/22/2021 10:24:00 AM

Lab ID: 2109D91-026

Matrix: SOIL

Received Date: 9/24/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/29/2021 7:15:28 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/29/2021 7:15:28 PM
Surr: DNOP	86.9	70-130		%Rec	1	9/29/2021 7:15:28 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/28/2021 1:00:00 AM
Surr: BFB	92.5	70-130		%Rec	1	9/28/2021 1:00:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	9/28/2021 1:00:00 AM
Toluene	ND	0.048		mg/Kg	1	9/28/2021 1:00:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	9/28/2021 1:00:00 AM
Xylenes, Total	ND	0.097		mg/Kg	1	9/28/2021 1:00:00 AM
Surr: 4-Bromofluorobenzene	80.6	70-130		%Rec	1	9/28/2021 1:00:00 AM

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

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

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# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2109D91

07-Oct-21

Client: HILCORP ENERGY

Project: Sullivan GC D 1E

Sample ID: <b>MB-63009</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63009</b>	RunNo: <b>81768</b>								
Prep Date: <b>10/4/2021</b>	Analysis Date: <b>10/4/2021</b>	SeqNo: <b>2891518</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-63009</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63009</b>	RunNo: <b>81768</b>								
Prep Date: <b>10/4/2021</b>	Analysis Date: <b>10/4/2021</b>	SeqNo: <b>2891519</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.7	90	110			

Sample ID: <b>MB-63009</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63009</b>	RunNo: <b>81812</b>								
Prep Date: <b>10/4/2021</b>	Analysis Date: <b>10/5/2021</b>	SeqNo: <b>2893696</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-63009</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63009</b>	RunNo: <b>81812</b>								
Prep Date: <b>10/4/2021</b>	Analysis Date: <b>10/5/2021</b>	SeqNo: <b>2893697</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.4	90	110			

### Qualifiers:

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2109D91

07-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>MB-62876</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>62876</b>	RunNo: <b>81664</b>								
Prep Date: <b>9/28/2021</b>	Analysis Date: <b>9/29/2021</b>	SeqNo: <b>2887986</b> 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								
Surr: DNOP	10		10.00		104	70	130			

Sample ID: <b>LCS-62876</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>62876</b>	RunNo: <b>81664</b>								
Prep Date: <b>9/28/2021</b>	Analysis Date: <b>9/29/2021</b>	SeqNo: <b>2887989</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	108	68.9	135			
Surr: DNOP	5.6		5.000		112	70	130			

Sample ID: <b>2109D91-012AMS</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>MW14 @ 10-15'</b>	Batch ID: <b>62876</b>	RunNo: <b>81664</b>								
Prep Date: <b>9/28/2021</b>	Analysis Date: <b>9/29/2021</b>	SeqNo: <b>2887992</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.6	47.85	0	93.0	39.3	155			
Surr: DNOP	4.5		4.785		94.3	70	130			

Sample ID: <b>2109D91-012AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>MW14 @ 10-15'</b>	Batch ID: <b>62876</b>	RunNo: <b>81664</b>								
Prep Date: <b>9/28/2021</b>	Analysis Date: <b>9/29/2021</b>	SeqNo: <b>2887995</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	9.3	46.51	0	90.9	39.3	155	5.01	23.4	
Surr: DNOP	4.3		4.651		92.8	70	130	0	0	

Sample ID: <b>MB-62875</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>62875</b>	RunNo: <b>81663</b>								
Prep Date: <b>9/28/2021</b>	Analysis Date: <b>9/29/2021</b>	SeqNo: <b>2888175</b> 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								
Surr: DNOP	11		10.00		112	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2109D91

07-Oct-21

Client: HILCORP ENERGY  
Project: Sullivan GC D 1E

Sample ID: LCS-62875	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 62875	RunNo: 81663								
Prep Date: 9/28/2021	Analysis Date: 9/29/2021	SeqNo: 2888176	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	61	10	50.00	0	122	68.9	135			
Surr: DNOP	5.4		5.000		108	70	130			

Qualifiers:

- \* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit



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

WO#: 2109D91

07-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>mb-62824</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>62824</b>	RunNo: <b>81596</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2883388</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1100		1000		105	70	130			

Sample ID: <b>lcs-62824</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>62824</b>	RunNo: <b>81596</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2883389</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	5.0	25.00	0	115	78.6	131			
Surr: BFB	1200		1000		116	70	130			

Sample ID: <b>lcs-62829</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884005</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	5.0	25.00	0	116	78.6	131			
Surr: BFB	1100		1000		111	70	130			

Sample ID: <b>mb-62829</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884006</b> Units: <b>mg/Kg</b>								
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	70	130			

Sample ID: <b>2109d91-016ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>MW13 @ 5-10'</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884008</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	4.7	23.58	0	114	61.3	114			
Surr: BFB	1000		943.4		108	70	130			

Sample ID: <b>2109d91-016amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>MW13 @ 5-10'</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884009</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

QC SUMMARY REPORT  
Hall Environmental Analysis Laboratory, Inc.

WO#: 2109D91  
07-Oct-21

Client: HILCORP ENERGY  
Project: Sullivan GC D 1E

Sample ID: 2109d91-016amsd		SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: MW13 @ 5-10'		Batch ID: 62829		RunNo: 81607						
Prep Date: 9/24/2021		Analysis Date: 9/27/2021		SeqNo: 2884009		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	4.8	23.92	0	109	61.3	114	3.10	20	
Surr: BFB	1000		956.9		104	70	130	0	0	

Qualifiers:

- \*

Value exceeds Maximum Contaminant Level.
- D

Sample Diluted Due to Matrix
- H

Holding times for preparation or analysis exceeded
- ND

Not Detected at the Reporting Limit
- PQL

Practical Quantitative Limit
- S

% Recovery outside of range due to dilution or matrix
- B

Analyte detected in the associated Method Blank
- E

Value above quantitation range
- J

Analyte detected below quantitation limits
- P

Sample pH Not In Range
- RL

Reporting Limit

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

WO#: 2109D91

07-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>mb-62824</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>62824</b>	RunNo: <b>81596</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2883435</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.91		1.000		90.6	70	130			

Sample ID: <b>LCS-62824</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>62824</b>	RunNo: <b>81596</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2883436</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.025	1.000	0	86.2	80	120			
Toluene	0.89	0.050	1.000	0	88.9	80	120			
Ethylbenzene	0.89	0.050	1.000	0	88.6	80	120			
Xylenes, Total	2.6	0.10	3.000	0	87.4	80	120			
Surr: 4-Bromofluorobenzene	0.90		1.000		90.1	70	130			

Sample ID: <b>lcs-62829</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884094</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	94.3	80	120			
Toluene	0.93	0.050	1.000	0	93.1	80	120			
Ethylbenzene	0.94	0.050	1.000	0	93.8	80	120			
Xylenes, Total	2.8	0.10	3.000	0	94.2	80	120			
Surr: 4-Bromofluorobenzene	0.81		1.000		80.6	70	130			

Sample ID: <b>mb-62829</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884095</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.79		1.000		79.1	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2109D91

07-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

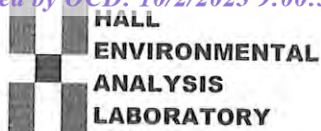
Sample ID: <b>2109d91-017ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW13 @ 26'</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884098</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	0.9940	0.01687	93.3	80	120			
Toluene	0.93	0.050	0.9940	0	93.3	80	120			
Ethylbenzene	1.7	0.050	0.9940	0.4755	120	80	120			
Xylenes, Total	9.0	0.099	2.982	3.675	177	80	120			S
Surr: 4-Bromofluorobenzene	1.2		0.9940		125	70	130			

Sample ID: <b>2109d91-017amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW13 @ 26'</b>	Batch ID: <b>62829</b>	RunNo: <b>81607</b>								
Prep Date: <b>9/24/2021</b>	Analysis Date: <b>9/27/2021</b>	SeqNo: <b>2884099</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.73	0.023	0.9234	0.01687	77.6	80	120	25.2	20	RS
Toluene	0.76	0.046	0.9234	0	82.3	80	120	19.8	20	
Ethylbenzene	1.2	0.046	0.9234	0.4755	78.2	80	120	32.8	20	RS
Xylenes, Total	5.2	0.092	2.770	3.675	56.5	80	120	52.3	20	RS
Surr: 4-Bromofluorobenzene	1.0		0.9234		110	70	130	0	0	

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2109D91

RcptNo: 1

Received By: Cheyenne Cason

9/24/2021 7:00:00 AM

Completed By: Isaiah Ortiz

9/24/2021 8:26:47 AM

Reviewed By:

JR 9/24/21

Chad  
I-OK

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4$ " for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

(&lt;2 or &gt;12 unless noted)

Adjusted?

Checked by: TME 9.24.21

Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

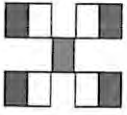
16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.7	Good	Not Present			
2	3.9	Good	Not Present			



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# HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

## Analysis Request

[illegible]

Remarks:   
 \* 012 Changed per  
 505a. ~~DAW~~ 9/10/11

## HOLD ALL CHLORIDE TESTS

## Chain-of-Custody Record

Client:	Hilcorp Energy Company	
	Kate Kaufman	
Mailing Address:		
	<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush	
	Project Name:	
	Sullivan GC D #1/E	
	Project #:	
	TE017821005	
Phone #:		

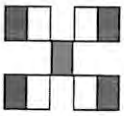
email or Fax#: K Kaufman Chikorp.com	Project Manager:	
QA/QC Package:	Josh Adams	
<input checked="" type="checkbox"/> Standard	<input type="checkbox"/> Level 4 (Full Validation)	
Accreditation:	<input type="checkbox"/> Az Compliance	
<input type="checkbox"/> NELAC	<input type="checkbox"/> Other	
<input checked="" type="checkbox"/> EDD (Type)	PDF	
	Sampler: Josh Adams	
	On Ice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
	# of Coolers: 2 5.6+0.1=5.7	
	Cooler Temp (including CF): 3.8+0.1=3.9 (°C)	

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
4-21-21	0946	soil	MW17 @ 10-15'	11) 402	cool	2109D91
	0950		MW17 @ 24-25'			001
	0948		MW17 @ 30'			002
	1146		SB17 @ 5-10'			003
	1148		SB17 @ 25-30'			004
	1154		SB17 @ 30-35'			005
	1541		MW18 @ 26-22'			006
	1542		MW18 @ 22-25'			007
	1540		MW18 @ 30-35'			008
						009
4-18-21	1630		MW14 @ 35-40'			010
	1545		MW14 @ 20-21'			011
	1540		MW14 @ 10-15' *			012

Date:	Time:	Relinquished by:	Received by:	Via:	Date:	Time:
9/23	1000	Spide Clark	Christa Clark		9/23/21	1000
9/23/21	1826	Christa Clark	Spide Clark		9/24/21	0700

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





**HALL ENVIRONMENTAL  
ANALYSIS LABORATORY**

[www.hallenvironmental.com](http://www.hallenvironmental.com)

4901 Hawkins NE - Albuquerque, NM 87109

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

## Analysis Request

[illegible]

Remarks: Please CC' Josh.adams@wsp.com  
Stuart.hydee@wsp.com

- Hold All Chloride Tests

## Chain-of-Custody Record

Client:	Hilcorp
	Kate Kaufman
Mailing Address:	
Phone #:	
email or Fax#:	kkaufman@hilcorp.com
QA/QC Package:	
<input checked="" type="checkbox"/> Standard	<input type="checkbox"/> Level 4 (Full Validation)
Accreditation:	<input type="checkbox"/> Az Compliance
<input type="checkbox"/> NELAC	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> EDD (Type)	PDF

Date	Time	Matrix	Sample Name
9/20	1718	Soil	MW16 @ 0-5'
	1716		MW16 @ 25-30'
	1714		MW16 @ 30-35'
	1610		MW13 @ 5-10'
	1611		MW13 @ 26'
✓	1609	✓	MW13 @ 30-35'
	1538		MW15 @ 20-25'
	1600		MW15 @ 26'
✓	1537	✓	MW15 @ 30-35'
9/22	1155		SB18 @ 25-30'
9/22	1201	✓	SB18 @ 30-35'

	Date:	Time:	Relinquished by:	F
	9/23.	1000	[Signature]	
	Date:	Time:	Relinquished by:	F
	9/23/21	1826	Moskowitz	

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







Hall Environmental Analysis Laboratory  
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Albuquerque, NM 87109  
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October 28, 2021

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

RE: Sullivan GCD 1E

OrderNo.: 2110484

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 20 sample(s) on 10/8/2021 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW20 @ 20-25

Project: Sullivan GCD 1E

Collection Date: 10/5/2021 9:25:00 AM

Lab ID: 2110484-001

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/11/2021 6:00:07 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/11/2021 6:00:07 PM
Surr: DNOP	104	70-130		%Rec	1	10/11/2021 6:00:07 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/12/2021 9:34:00 PM
Surr: BFB	89.2	70-130		%Rec	1	10/12/2021 9:34:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.024		mg/Kg	1	10/12/2021 9:34:00 PM
Toluene	ND	0.049		mg/Kg	1	10/12/2021 9:34:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/12/2021 9:34:00 PM
Xylenes, Total	ND	0.097		mg/Kg	1	10/12/2021 9:34:00 PM
Surr: 4-Bromofluorobenzene	79.1	70-130		%Rec	1	10/12/2021 9:34:00 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>JMT</b>
Chloride	ND	60		mg/Kg	20	10/24/2021 1:16:43 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW20 @ 25-30

Project: Sullivan GCD 1E

Collection Date: 10/5/2021 9:35:00 AM

Lab ID: 2110484-002

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	10	9.9		mg/Kg	1	10/11/2021 6:24:23 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/11/2021 6:24:23 PM
Surr: DNOP	101	70-130		%Rec	1	10/11/2021 6:24:23 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	6.4	4.8		mg/Kg	1	10/12/2021 9:53:00 PM
Surr: BFB	219	70-130	S	%Rec	1	10/12/2021 9:53:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.024		mg/Kg	1	10/12/2021 9:53:00 PM
Toluene	ND	0.048		mg/Kg	1	10/12/2021 9:53:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/12/2021 9:53:00 PM
Xylenes, Total	ND	0.096		mg/Kg	1	10/12/2021 9:53:00 PM
Surr: 4-Bromofluorobenzene	163	70-130	S	%Rec	1	10/12/2021 9:53:00 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW20 @ 30-35

Project: Sullivan GCD 1E

Collection Date: 10/5/2021 9:45:00 AM

Lab ID: 2110484-003

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	65	9.3		mg/Kg	1	10/11/2021 6:48:43 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/11/2021 6:48:43 PM
Surr: DNOP	96.6	70-130		%Rec	1	10/11/2021 6:48:43 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	610	98		mg/Kg	20	10/12/2021 10:13:00 PM
Surr: BFB	181	70-130	S	%Rec	20	10/12/2021 10:13:00 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.49		mg/Kg	20	10/12/2021 10:13:00 PM
Toluene	1.6	0.98		mg/Kg	20	10/12/2021 10:13:00 PM
Ethylbenzene	3.6	0.98		mg/Kg	20	10/12/2021 10:13:00 PM
Xylenes, Total	30	2.0		mg/Kg	20	10/12/2021 10:13:00 PM
Surr: 4-Bromofluorobenzene	99.3	70-130		%Rec	20	10/12/2021 10:13:00 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW20 @ 35-40

Project: Sullivan GCD 1E

Collection Date: 10/5/2021 9:55:00 AM

Lab ID: 2110484-004

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/14/2021 7:26:12 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/14/2021 7:26:12 AM
Surr: DNOP	87.0	70-130		%Rec	1	10/14/2021 7:26:12 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/14/2021 1:47:00 AM
Surr: BFB	92.1	70-130		%Rec	1	10/14/2021 1:47:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.025		mg/Kg	1	10/14/2021 10:39:00 AM
Toluene	ND	0.050		mg/Kg	1	10/14/2021 10:39:00 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/14/2021 10:39:00 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/14/2021 10:39:00 AM
Surr: 4-Bromofluorobenzene	82.1	70-130		%Rec	1	10/14/2021 10:39:00 AM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW21 @ 5-10

Project: Sullivan GCD 1E

Collection Date: 10/5/2021 3:15:00 PM

Lab ID: 2110484-005

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	10/14/2021 1:54:06 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/14/2021 1:54:06 PM
Surr: DNOP	74.7	70-130		%Rec	1	10/14/2021 1:54:06 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/14/2021 2:07:00 AM
Surr: BFB	91.2	70-130		%Rec	1	10/14/2021 2:07:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.023		mg/Kg	1	10/14/2021 10:58:00 AM
Toluene	ND	0.047		mg/Kg	1	10/14/2021 10:58:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/14/2021 10:58:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	10/14/2021 10:58:00 AM
Surr: 4-Bromofluorobenzene	81.0	70-130		%Rec	1	10/14/2021 10:58:00 AM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/20/2021 12:51:31 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW21 @ 20-30

Project: Sullivan GCD 1E

Collection Date: 10/5/2021 3:18:00 PM

Lab ID: 2110484-006

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	10/14/2021 8:08:59 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/14/2021 8:08:59 AM
Surr: DNOP	77.2	70-130		%Rec	1	10/14/2021 8:08:59 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/14/2021 2:26:00 AM
Surr: BFB	89.3	70-130		%Rec	1	10/14/2021 2:26:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 11:18:00 AM
Toluene	ND	0.047		mg/Kg	1	10/14/2021 11:18:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/14/2021 11:18:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	10/14/2021 11:18:00 AM
Surr: 4-Bromofluorobenzene	86.0	70-130		%Rec	1	10/14/2021 11:18:00 AM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW21 @ 30-35

Project: Sullivan GCD 1E

Collection Date: 10/5/2021 3:22:00 PM

Lab ID: 2110484-007

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	8.3		mg/Kg	1	10/14/2021 8:19:42 AM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	10/14/2021 8:19:42 AM
Surr: DNOP	92.8	70-130		%Rec	1	10/14/2021 8:19:42 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/14/2021 2:46:00 AM
Surr: BFB	89.9	70-130		%Rec	1	10/14/2021 2:46:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 11:38:00 AM
Toluene	ND	0.048		mg/Kg	1	10/14/2021 11:38:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	10/14/2021 11:38:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	10/14/2021 11:38:00 AM
Surr: 4-Bromofluorobenzene	90.3	70-130		%Rec	1	10/14/2021 11:38:00 AM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW22 @ 15-20

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 10:44:00 AM

Lab ID: 2110484-008

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/14/2021 8:30:23 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/14/2021 8:30:23 AM
Surr: DNOP	91.5	70-130		%Rec	1	10/14/2021 8:30:23 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/14/2021 3:05:00 AM
Surr: BFB	91.4	70-130		%Rec	1	10/14/2021 3:05:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 11:58:00 AM
Toluene	ND	0.048		mg/Kg	1	10/14/2021 11:58:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	10/14/2021 11:58:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	10/14/2021 11:58:00 AM
Surr: 4-Bromofluorobenzene	89.2	70-130		%Rec	1	10/14/2021 11:58:00 AM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW22 @ 20-25

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 10:46:00 AM

Lab ID: 2110484-009

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/14/2021 8:41:04 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/14/2021 8:41:04 AM
Surr: DNOP	92.7	70-130		%Rec	1	10/14/2021 8:41:04 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/14/2021 3:25:00 AM
Surr: BFB	93.0	70-130		%Rec	1	10/14/2021 3:25:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 12:17:00 PM
Toluene	ND	0.048		mg/Kg	1	10/14/2021 12:17:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/14/2021 12:17:00 PM
Xylenes, Total	ND	0.095		mg/Kg	1	10/14/2021 12:17:00 PM
Surr: 4-Bromofluorobenzene	89.8	70-130		%Rec	1	10/14/2021 12:17:00 PM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/20/2021 1:28:46 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW22 @ 25-30

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 10:50:00 AM

Lab ID: 2110484-010

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	9.8	9.3		mg/Kg	1	10/14/2021 8:51:50 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/14/2021 8:51:50 AM
Surr: DNOP	95.7	70-130		%Rec	1	10/14/2021 8:51:50 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	10/14/2021 3:44:00 AM
Surr: BFB	135	70-130	S	%Rec	1	10/14/2021 3:44:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.023		mg/Kg	1	10/14/2021 12:37:00 PM
Toluene	ND	0.046		mg/Kg	1	10/14/2021 12:37:00 PM
Ethylbenzene	ND	0.046		mg/Kg	1	10/14/2021 12:37:00 PM
Xylenes, Total	ND	0.092		mg/Kg	1	10/14/2021 12:37:00 PM
Surr: 4-Bromofluorobenzene	89.7	70-130		%Rec	1	10/14/2021 12:37:00 PM

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

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

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW22 @ 30-35

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 10:52:00 AM

Lab ID: 2110484-011

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/14/2021 9:02:36 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/14/2021 9:02:36 AM
Surr: DNOP	80.6	70-130		%Rec	1	10/14/2021 9:02:36 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: <b>mb</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/14/2021 4:43:00 AM
Surr: BFB	93.8	70-130		%Rec	1	10/14/2021 4:43:00 AM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>mb</b>
Benzene	ND	0.025		mg/Kg	1	10/14/2021 12:57:00 PM
Toluene	ND	0.050		mg/Kg	1	10/14/2021 12:57:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/14/2021 12:57:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/14/2021 12:57:00 PM
Surr: 4-Bromofluorobenzene	80.0	70-130		%Rec	1	10/14/2021 12:57:00 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW22 @ 32.5-35

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 10:40:00 AM

Lab ID: 2110484-012

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: SB
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/14/2021 5:50:19 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/14/2021 5:50:19 AM
Surr: DNOP	110	70-130		%Rec	1	10/14/2021 5:50:19 AM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: RAA
Benzene	ND	0.023		mg/Kg	1	10/14/2021 6:17:01 PM
Toluene	ND	0.046		mg/Kg	1	10/14/2021 6:17:01 PM
Ethylbenzene	ND	0.046		mg/Kg	1	10/14/2021 6:17:01 PM
Xylenes, Total	ND	0.093		mg/Kg	1	10/14/2021 6:17:01 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	10/14/2021 6:17:01 PM
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	10/14/2021 6:17:01 PM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/14/2021 6:17:01 PM
Surr: Toluene-d8	96.5	70-130		%Rec	1	10/14/2021 6:17:01 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	10/14/2021 6:17:01 PM
Surr: BFB	106	70-130		%Rec	1	10/14/2021 6:17:01 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SB19 @ 20-26

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 1:15:00 PM

Lab ID: 2110484-013

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/14/2021 6:00:56 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/14/2021 6:00:56 AM
Surr: DNOP	92.3	70-130		%Rec	1	10/14/2021 6:00:56 AM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>VP</b>
Chloride	ND	60		mg/Kg	20	10/20/2021 2:05:59 PM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 7:42:45 PM
Toluene	ND	0.048		mg/Kg	1	10/14/2021 7:42:45 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/14/2021 7:42:45 PM
Xylenes, Total	0.30	0.095		mg/Kg	1	10/14/2021 7:42:45 PM
Surr: 1,2-Dichloroethane-d4	99.8	70-130		%Rec	1	10/14/2021 7:42:45 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/14/2021 7:42:45 PM
Surr: Dibromofluoromethane	101	70-130		%Rec	1	10/14/2021 7:42:45 PM
Surr: Toluene-d8	93.5	70-130		%Rec	1	10/14/2021 7:42:45 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/14/2021 7:42:45 PM
Surr: BFB	99.0	70-130		%Rec	1	10/14/2021 7:42:45 PM

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

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

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SB19 @ 31-36

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 1:20:00 PM

Lab ID: 2110484-014

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	10/14/2021 6:11:33 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/14/2021 6:11:33 AM
Surr: DNOP	93.6	70-130		%Rec	1	10/14/2021 6:11:33 AM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 9:08:27 PM
Toluene	ND	0.047		mg/Kg	1	10/14/2021 9:08:27 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/14/2021 9:08:27 PM
Xylenes, Total	ND	0.095		mg/Kg	1	10/14/2021 9:08:27 PM
Surr: 1,2-Dichloroethane-d4	97.8	70-130		%Rec	1	10/14/2021 9:08:27 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	10/14/2021 9:08:27 PM
Surr: Dibromofluoromethane	99.1	70-130		%Rec	1	10/14/2021 9:08:27 PM
Surr: Toluene-d8	96.3	70-130		%Rec	1	10/14/2021 9:08:27 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/14/2021 9:08:27 PM
Surr: BFB	103	70-130		%Rec	1	10/14/2021 9:08:27 PM

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

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

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW23 @ 20-25

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 4:05:00 PM

Lab ID: 2110484-015

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/14/2021 6:22:09 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/14/2021 6:22:09 AM
Surr: DNOP	93.8	70-130		%Rec	1	10/14/2021 6:22:09 AM
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: <b>JMT</b>
Chloride	ND	60		mg/Kg	20	10/24/2021 1:29:04 PM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: <b>RAA</b>
Benzene	ND	0.025		mg/Kg	1	10/14/2021 9:37:02 PM
Toluene	ND	0.050		mg/Kg	1	10/14/2021 9:37:02 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/14/2021 9:37:02 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/14/2021 9:37:02 PM
Surr: 1,2-Dichloroethane-d4	98.6	70-130		%Rec	1	10/14/2021 9:37:02 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/14/2021 9:37:02 PM
Surr: Dibromofluoromethane	99.1	70-130		%Rec	1	10/14/2021 9:37:02 PM
Surr: Toluene-d8	96.3	70-130		%Rec	1	10/14/2021 9:37:02 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/14/2021 9:37:02 PM
Surr: BFB	103	70-130		%Rec	1	10/14/2021 9:37:02 PM

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

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

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW23 @ 25-30

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 4:00:00 PM

Lab ID: 2110484-016

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: SB
Diesel Range Organics (DRO)	65	8.5		mg/Kg	1	10/14/2021 6:32:49 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/14/2021 6:32:49 AM
Surr: DNOP	91.1	70-130		%Rec	1	10/14/2021 6:32:49 AM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: RAA
Benzene	ND	0.048		mg/Kg	2	10/15/2021 7:34:12 PM
Toluene	ND	0.095		mg/Kg	2	10/15/2021 7:34:12 PM
Ethylbenzene	0.20	0.095		mg/Kg	2	10/15/2021 7:34:12 PM
Xylenes, Total	2.4	0.19		mg/Kg	2	10/15/2021 7:34:12 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	2	10/15/2021 7:34:12 PM
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	2	10/15/2021 7:34:12 PM
Surr: Dibromofluoromethane	102	70-130		%Rec	2	10/15/2021 7:34:12 PM
Surr: Toluene-d8	100	70-130		%Rec	2	10/15/2021 7:34:12 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: RAA
Gasoline Range Organics (GRO)	110	9.5		mg/Kg	2	10/15/2021 7:34:12 PM
Surr: BFB	115	70-130		%Rec	2	10/15/2021 7:34:12 PM

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

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

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## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW23 @ 30-35

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 3:55:00 PM

Lab ID: 2110484-017

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	110	9.1		mg/Kg	1	10/14/2021 6:43:33 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	10/14/2021 6:43:33 AM
Surr: DNOP	93.7	70-130		%Rec	1	10/14/2021 6:43:33 AM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: <b>RAA</b>
Benzene	0.30	0.12		mg/Kg	5	10/14/2021 10:34:09 PM
Toluene	4.3	0.25		mg/Kg	5	10/14/2021 10:34:09 PM
Ethylbenzene	3.4	0.25		mg/Kg	5	10/14/2021 10:34:09 PM
Xylenes, Total	35	0.49		mg/Kg	5	10/14/2021 10:34:09 PM
Surr: 1,2-Dichloroethane-d4	96.8	70-130		%Rec	5	10/14/2021 10:34:09 PM
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	5	10/14/2021 10:34:09 PM
Surr: Dibromofluoromethane	96.7	70-130		%Rec	5	10/14/2021 10:34:09 PM
Surr: Toluene-d8	95.5	70-130		%Rec	5	10/14/2021 10:34:09 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	980	25		mg/Kg	5	10/14/2021 10:34:09 PM
Surr: BFB	113	70-130		%Rec	5	10/14/2021 10:34:09 PM

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

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

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW23 @ 35-40

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 3:51:00 PM

Lab ID: 2110484-018

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	10/14/2021 6:54:16 AM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	10/14/2021 6:54:16 AM
Surr: DNOP	92.3	70-130		%Rec	1	10/14/2021 6:54:16 AM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 11:02:42 PM
Toluene	0.050	0.049		mg/Kg	1	10/14/2021 11:02:42 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/14/2021 11:02:42 PM
Xylenes, Total	0.43	0.097		mg/Kg	1	10/14/2021 11:02:42 PM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	10/14/2021 11:02:42 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	10/14/2021 11:02:42 PM
Surr: Dibromofluoromethane	99.9	70-130		%Rec	1	10/14/2021 11:02:42 PM
Surr: Toluene-d8	93.3	70-130		%Rec	1	10/14/2021 11:02:42 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/14/2021 11:02:42 PM
Surr: BFB	102	70-130		%Rec	1	10/14/2021 11:02:42 PM

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

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

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW23 @ 40-45

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 3:42:00 PM

Lab ID: 2110484-019

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	10/14/2021 7:04:57 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/14/2021 7:04:57 AM
Surr: DNOP	97.3	70-130		%Rec	1	10/14/2021 7:04:57 AM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 11:31:19 PM
Toluene	ND	0.047		mg/Kg	1	10/14/2021 11:31:19 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/14/2021 11:31:19 PM
Xylenes, Total	0.10	0.094		mg/Kg	1	10/14/2021 11:31:19 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	10/14/2021 11:31:19 PM
Surr: 4-Bromofluorobenzene	99.3	70-130		%Rec	1	10/14/2021 11:31:19 PM
Surr: Dibromofluoromethane	96.8	70-130		%Rec	1	10/14/2021 11:31:19 PM
Surr: Toluene-d8	95.5	70-130		%Rec	1	10/14/2021 11:31:19 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/14/2021 11:31:19 PM
Surr: BFB	104	70-130		%Rec	1	10/14/2021 11:31:19 PM

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

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

## Analytical Report

Lab Order 2110484

Date Reported: 10/28/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW23 @ 42.5

Project: Sullivan GCD 1E

Collection Date: 10/6/2021 3:35:00 PM

Lab ID: 2110484-020

Matrix: SOIL

Received Date: 10/8/2021 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: <b>SB</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	10/14/2021 7:15:37 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/14/2021 7:15:37 AM
Surr: DNOP	92.3	70-130		%Rec	1	10/14/2021 7:15:37 AM
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>						Analyst: <b>RAA</b>
Benzene	ND	0.024		mg/Kg	1	10/14/2021 11:59:53 PM
Toluene	ND	0.049		mg/Kg	1	10/14/2021 11:59:53 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/14/2021 11:59:53 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/14/2021 11:59:53 PM
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	10/14/2021 11:59:53 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	10/14/2021 11:59:53 PM
Surr: Dibromofluoromethane	98.6	70-130		%Rec	1	10/14/2021 11:59:53 PM
Surr: Toluene-d8	91.3	70-130		%Rec	1	10/14/2021 11:59:53 PM
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>						Analyst: <b>RAA</b>
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/14/2021 11:59:53 PM
Surr: BFB	96.9	70-130		%Rec	1	10/14/2021 11:59:53 PM

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

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



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

WO#: 2110484

28-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GCD 1E

Sample ID: <b>MB-63424</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63424</b>	RunNo: <b>82180</b>								
Prep Date: <b>10/20/2021</b>	Analysis Date: <b>10/20/2021</b>	SeqNo: <b>2913840</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-63424</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63424</b>	RunNo: <b>82180</b>								
Prep Date: <b>10/20/2021</b>	Analysis Date: <b>10/20/2021</b>	SeqNo: <b>2913841</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.7	90	110			

Sample ID: <b>MB-63510</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63510</b>	RunNo: <b>82306</b>								
Prep Date: <b>10/22/2021</b>	Analysis Date: <b>10/24/2021</b>	SeqNo: <b>2918361</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-63510</b>	SampType: <b>lcs</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63510</b>	RunNo: <b>82306</b>								
Prep Date: <b>10/22/2021</b>	Analysis Date: <b>10/24/2021</b>	SeqNo: <b>2918362</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.0	90	110			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2110484

28-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GCD 1E

Sample ID: <b>MB-63186</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63186</b>	RunNo: <b>81963</b>								
Prep Date: <b>10/10/2021</b>	Analysis Date: <b>10/11/2021</b>	SeqNo: <b>2901767</b>			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								
Surr: DNOP	9.6		10.00		95.9	70	130			

Sample ID: <b>LCS-63186</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63186</b>	RunNo: <b>81963</b>								
Prep Date: <b>10/10/2021</b>	Analysis Date: <b>10/11/2021</b>	SeqNo: <b>2901768</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	92.7	68.9	135			
Surr: DNOP	4.8		5.000		96.1	70	130			

Sample ID: <b>2110484-004AMS</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>MW20 @ 35-40</b>	Batch ID: <b>63232</b>	RunNo: <b>82009</b>								
Prep Date: <b>10/12/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2905089</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	8.7	43.48	0	93.3	39.3	155			
Surr: DNOP	4.4		4.348		101	70	130			

Sample ID: <b>2110484-004AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>MW20 @ 35-40</b>	Batch ID: <b>63232</b>	RunNo: <b>82009</b>								
Prep Date: <b>10/12/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2905090</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	9.0	45.13	0	92.8	39.3	155	3.25	23.4	
Surr: DNOP	4.6		4.513		103	70	130	0	0	

Sample ID: <b>LCS-63230</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63230</b>	RunNo: <b>82009</b>								
Prep Date: <b>10/12/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2905140</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	99.0	68.9	135			
Surr: DNOP	5.2		5.000		104	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2110484

28-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GCD 1E

Sample ID: <b>MB-63230</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63230</b>	RunNo: <b>82009</b>								
Prep Date: <b>10/12/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2905144</b>	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								
Surr: DNOP	9.5		10.00		95.0	70	130			

Sample ID: <b>MB-63232</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63232</b>	RunNo: <b>82006</b>								
Prep Date: <b>10/12/2021</b>	Analysis Date: <b>10/13/2021</b>	SeqNo: <b>2905873</b>	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								
Surr: DNOP	10		10.00		103	70	130			

Sample ID: <b>LCS-63232</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63232</b>	RunNo: <b>82006</b>								
Prep Date: <b>10/12/2021</b>	Analysis Date: <b>10/13/2021</b>	SeqNo: <b>2905880</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	56	10	50.00	0	111	68.9	135			
Surr: DNOP	5.6		5.000		112	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2110484

28-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GCD 1E

Sample ID: <b>mb-63174</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63174</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/9/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2902623</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	890		1000		89.0	70	130			

Sample ID: <b>lcs-63174</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63174</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/9/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2902624</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	108	78.6	131			
Surr: BFB	1000		1000		102	70	130			

Sample ID: <b>mb-63214</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63214</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2903036</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	880		1000		87.7	70	130			

Sample ID: <b>lcs-63214</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63214</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2903040</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	5.0	25.00	0	115	78.6	131			
Surr: BFB	1100		1000		107	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 P Sample pH Not In Range  
 RL Reporting Limit



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

WO#: 2110484

28-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GCD 1E

Sample ID: <b>mb-63174</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63174</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/9/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2902625</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.83		1.000		83.1	70	130			

Sample ID: <b>lcs-63174</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63174</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/9/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2902626</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.3	80	120			
Toluene	1.0	0.050	1.000	0	99.7	80	120			
Ethylbenzene	0.93	0.050	1.000	0	93.5	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.4	80	120			
Surr: 4-Bromofluorobenzene	0.78		1.000		78.2	70	130			

Sample ID: <b>mb-63214</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63214</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2903043</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.82		1.000		82.1	70	130			

Sample ID: <b>lcs-63214</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63214</b>	RunNo: <b>81968</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/12/2021</b>	SeqNo: <b>2903046</b>			Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	91.5	80	120			
Toluene	0.90	0.050	1.000	0	90.4	80	120			
Ethylbenzene	0.92	0.050	1.000	0	91.9	80	120			
Xylenes, Total	2.8	0.10	3.000	0	94.0	80	120			
Surr: 4-Bromofluorobenzene	0.82		1.000		81.9	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2110484

28-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GCD 1E

Sample ID: <b>2110484-013ams</b>	SampType: <b>MS4</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>SB19 @ 20-26</b>	Batch ID: <b>63217</b>	RunNo: <b>82099</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2907834</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.024	0.9785	0	98.1	73.5	138			
Toluene	0.89	0.049	0.9785	0	90.6	83	131			
Ethylbenzene	0.91	0.049	0.9785	0	92.6	84.9	132			
Xylenes, Total	2.9	0.098	2.935	0.2986	89.5	79.6	144			
Surr: 1,2-Dichloroethane-d4	0.50		0.4892		101	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.4892		101	70	130			
Surr: Dibromofluoromethane	0.48		0.4892		98.9	70	130			
Surr: Toluene-d8	0.47		0.4892		95.5	70	130			

Sample ID: <b>2110484-013amsd</b>	SampType: <b>MSD4</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>SB19 @ 20-26</b>	Batch ID: <b>63217</b>	RunNo: <b>82099</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2907835</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.023	0.9363	0	96.7	73.5	138	5.85	20	
Toluene	0.87	0.047	0.9363	0	92.7	83	131	2.10	20	
Ethylbenzene	0.88	0.047	0.9363	0	94.4	84.9	132	2.51	20	
Xylenes, Total	3.0	0.094	2.809	0.2986	96.0	79.6	144	2.32	20	
Surr: 1,2-Dichloroethane-d4	0.43		0.4682		92.7	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.47		0.4682		99.5	70	130	0	0	
Surr: Dibromofluoromethane	0.45		0.4682		95.4	70	130	0	0	
Surr: Toluene-d8	0.45		0.4682		96.5	70	130	0	0	

Sample ID: <b>Ics-63217</b>	SampType: <b>LCS4</b>	TestCode: <b>EPA Method 8260B: Volatiles Short List</b>								
Client ID: <b>BatchQC</b>	Batch ID: <b>63217</b>	RunNo: <b>82099</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2907843</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	105	80	120			
Toluene	0.95	0.050	1.000	0	95.2	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.5	80	120			
Xylenes, Total	2.9	0.10	3.000	0	96.8	80	120			
Surr: 1,2-Dichloroethane-d4	0.51		0.5000		102	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		105	70	130			
Surr: Dibromofluoromethane	0.51		0.5000		103	70	130			
Surr: Toluene-d8	0.50		0.5000		99.8	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110484

28-Oct-21

Client: HILCORP ENERGY  
Project: Sullivan GCD 1E

Sample ID: mb-63217	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 63217	RunNo: 82099								
Prep Date: 10/11/2021	Analysis Date: 10/14/2021	SeqNo: 2907844	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.51		0.5000		103	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		103	70	130			
Surr: Dibromofluoromethane	0.51		0.5000		102	70	130			
Surr: Toluene-d8	0.47		0.5000		94.2	70	130			

Qualifiers:

- \* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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

WO#: 2110484

28-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GCD 1E

Sample ID: <b>2110484-012ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>								
Client ID: <b>MW22 @ 32.5-35</b>	Batch ID: <b>63217</b>	RunNo: <b>82099</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2907857</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.6	23.04	0	97.5	64.4	124			
Surr: BFB	470		460.8		101	70	130			

Sample ID: <b>2110484-012amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>								
Client ID: <b>MW22 @ 32.5-35</b>	Batch ID: <b>63217</b>	RunNo: <b>82099</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2907858</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	24.80	0	92.1	64.4	124	1.62	20	
Surr: BFB	500		496.0		101	70	130	0	0	

Sample ID: <b>lcs-63217</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>63217</b>	RunNo: <b>82099</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2907867</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	98.8	70	130			
Surr: BFB	490		500.0		98.0	70	130			

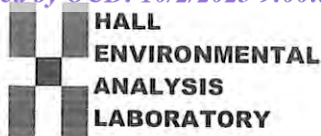
Sample ID: <b>mb-63217</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015D Mod: Gasoline Range</b>								
Client ID: <b>PBS</b>	Batch ID: <b>63217</b>	RunNo: <b>82099</b>								
Prep Date: <b>10/11/2021</b>	Analysis Date: <b>10/14/2021</b>	SeqNo: <b>2907868</b> Units: <b>mg/Kg</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	500		500.0		101	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit





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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2110484

RcptNo: 1

Received By: Cheyenne Cason

10/8/2021 7:00:00 AM

Completed By: Isaiah Ortiz

10/8/2021 9:04:26 AM

Reviewed By:

Jn 10/8/21

Chad

I-OK

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4"$  for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted? \_\_\_\_\_

Checked by: KRC 10/08/21

Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Not Present			
2	2.4	Good	Not Present			









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

April 28, 2023

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

RE: Sullivan GC D 1E

OrderNo.: 2304848

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 12 sample(s) on 4/20/2023 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109



## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH24- 37-38

Project: Sullivan GC D 1E

Collection Date: 4/15/2023 2:00:00 PM

Lab ID: 2304848-001

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: JME
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	4/25/2023 3:23:21 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	4/25/2023 3:23:21 AM
Surr: DNOP	82.0	69-147		%Rec	1	4/25/2023 3:23:21 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/24/2023 7:12:40 PM
Surr: BFB	113	37.7-212		%Rec	1	4/24/2023 7:12:40 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/24/2023 7:12:40 PM
Toluene	ND	0.049		mg/Kg	1	4/24/2023 7:12:40 PM
Ethylbenzene	ND	0.049		mg/Kg	1	4/24/2023 7:12:40 PM
Xylenes, Total	ND	0.097		mg/Kg	1	4/24/2023 7:12:40 PM
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	4/24/2023 7:12:40 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH24- 30-35

Project: Sullivan GC D 1E

Collection Date: 4/15/2023 2:05:00 PM

Lab ID: 2304848-002

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: JME
Diesel Range Organics (DRO)	310	10		mg/Kg	1	4/25/2023 3:47:02 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	4/25/2023 3:47:02 AM
Surr: DNOP	82.0	69-147		%Rec	1	4/25/2023 3:47:02 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	950	96		mg/Kg	20	4/24/2023 7:35:56 PM
Surr: BFB	1200	37.7-212	S	%Rec	20	4/24/2023 7:35:56 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.48		mg/Kg	20	4/24/2023 7:35:56 PM
Toluene	4.9	0.96		mg/Kg	20	4/24/2023 7:35:56 PM
Ethylbenzene	5.0	0.96		mg/Kg	20	4/24/2023 7:35:56 PM
Xylenes, Total	62	1.9		mg/Kg	20	4/24/2023 7:35:56 PM
Surr: 4-Bromofluorobenzene	113	70-130		%Rec	20	4/24/2023 7:35:56 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 2 of 18

## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH24- 25-30

Project: Sullivan GC D 1E

Collection Date: 4/15/2023 2:09:00 PM

Lab ID: 2304848-003

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: JME
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	4/25/2023 4:10:44 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/25/2023 4:10:44 AM
Surr: DNOP	78.7	69-147		%Rec	1	4/25/2023 4:10:44 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/24/2023 7:59:13 PM
Surr: BFB	135	37.7-212		%Rec	1	4/24/2023 7:59:13 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	4/24/2023 7:59:13 PM
Toluene	ND	0.050		mg/Kg	1	4/24/2023 7:59:13 PM
Ethylbenzene	ND	0.050		mg/Kg	1	4/24/2023 7:59:13 PM
Xylenes, Total	ND	0.10		mg/Kg	1	4/24/2023 7:59:13 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	4/24/2023 7:59:13 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Page 3 of 18

## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH25- 35-40

Project: Sullivan GC D 1E

Collection Date: 4/15/2023 5:30:00 PM

Lab ID: 2304848-004

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: JME
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	4/25/2023 4:34:25 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	4/25/2023 4:34:25 AM
Surr: DNOP	81.3	69-147		%Rec	1	4/25/2023 4:34:25 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/24/2023 8:22:32 PM
Surr: BFB	147	37.7-212		%Rec	1	4/24/2023 8:22:32 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/24/2023 8:22:32 PM
Toluene	ND	0.047		mg/Kg	1	4/24/2023 8:22:32 PM
Ethylbenzene	ND	0.047		mg/Kg	1	4/24/2023 8:22:32 PM
Xylenes, Total	ND	0.095		mg/Kg	1	4/24/2023 8:22:32 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	4/24/2023 8:22:32 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		



## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH25- 30-35

Project: Sullivan GC D 1E

Collection Date: 4/15/2023 5:35:00 PM

Lab ID: 2304848-005

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: JME
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	4/25/2023 4:58:05 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/25/2023 4:58:05 AM
Surr: DNOP	83.5	69-147		%Rec	1	4/25/2023 4:58:05 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/24/2023 8:45:50 PM
Surr: BFB	135	37.7-212		%Rec	1	4/24/2023 8:45:50 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	4/24/2023 8:45:50 PM
Toluene	ND	0.050		mg/Kg	1	4/24/2023 8:45:50 PM
Ethylbenzene	ND	0.050		mg/Kg	1	4/24/2023 8:45:50 PM
Xylenes, Total	ND	0.099		mg/Kg	1	4/24/2023 8:45:50 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	4/24/2023 8:45:50 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH25- 44-45

Project: Sullivan GC D 1E

Collection Date: 4/15/2023 5:38:00 PM

Lab ID: 2304848-006

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: JME
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	4/25/2023 5:21:43 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/25/2023 5:21:43 AM
Surr: DNOP	80.5	69-147		%Rec	1	4/25/2023 5:21:43 AM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/24/2023 9:09:08 PM
Surr: BFB	103	37.7-212		%Rec	1	4/24/2023 9:09:08 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/24/2023 9:09:08 PM
Toluene	ND	0.047		mg/Kg	1	4/24/2023 9:09:08 PM
Ethylbenzene	ND	0.047		mg/Kg	1	4/24/2023 9:09:08 PM
Xylenes, Total	ND	0.094		mg/Kg	1	4/24/2023 9:09:08 PM
Surr: 4-Bromofluorobenzene	97.5	70-130		%Rec	1	4/24/2023 9:09:08 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH26- 30-35

Project: Sullivan GC D 1E

Collection Date: 4/16/2023 11:15:00 AM

Lab ID: 2304848-007

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: PRD
Diesel Range Organics (DRO)	12	9.7		mg/Kg	1	4/25/2023 3:57:02 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/25/2023 3:57:02 PM
Surr: DNOP	94.0	69-147		%Rec	1	4/25/2023 3:57:02 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/27/2023 5:27:08 PM
Surr: BFB	117	37.7-212		%Rec	1	4/27/2023 5:27:08 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/27/2023 5:27:08 PM
Toluene	ND	0.048		mg/Kg	1	4/27/2023 5:27:08 PM
Ethylbenzene	ND	0.048		mg/Kg	1	4/27/2023 5:27:08 PM
Xylenes, Total	ND	0.097		mg/Kg	1	4/27/2023 5:27:08 PM
Surr: 4-Bromofluorobenzene	99.9	70-130		%Rec	1	4/27/2023 5:27:08 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH26- 40-42.5

Project: Sullivan GC D 1E

Collection Date: 4/16/2023 11:36:00 AM

Lab ID: 2304848-008

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	4/25/2023 4:29:06 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/25/2023 4:29:06 PM
Surr: DNOP	91.6	69-147		%Rec	1	4/25/2023 4:29:06 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/27/2023 5:50:33 PM
Surr: BFB	118	37.7-212		%Rec	1	4/27/2023 5:50:33 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/27/2023 5:50:33 PM
Toluene	ND	0.048		mg/Kg	1	4/27/2023 5:50:33 PM
Ethylbenzene	ND	0.048		mg/Kg	1	4/27/2023 5:50:33 PM
Xylenes, Total	ND	0.097		mg/Kg	1	4/27/2023 5:50:33 PM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	4/27/2023 5:50:33 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH27- 30-35

Project: Sullivan GC D 1E

Collection Date: 4/16/2023 1:40:00 PM

Lab ID: 2304848-009

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	4/25/2023 4:39:58 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/25/2023 4:39:58 PM
Surr: DNOP	93.6	69-147		%Rec	1	4/25/2023 4:39:58 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/27/2023 6:37:22 PM
Surr: BFB	98.6	37.7-212		%Rec	1	4/27/2023 6:37:22 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.025		mg/Kg	1	4/27/2023 6:37:22 PM
Toluene	ND	0.050		mg/Kg	1	4/27/2023 6:37:22 PM
Ethylbenzene	ND	0.050		mg/Kg	1	4/27/2023 6:37:22 PM
Xylenes, Total	ND	0.099		mg/Kg	1	4/27/2023 6:37:22 PM
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	4/27/2023 6:37:22 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH27- 35-40

Project: Sullivan GC D 1E

Collection Date: 4/16/2023 1:55:00 PM

Lab ID: 2304848-010

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	4/25/2023 4:50:40 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	4/25/2023 4:50:40 PM
Surr: DNOP	94.7	69-147		%Rec	1	4/25/2023 4:50:40 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/27/2023 7:00:45 PM
Surr: BFB	99.3	37.7-212		%Rec	1	4/27/2023 7:00:45 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/27/2023 7:00:45 PM
Toluene	ND	0.048		mg/Kg	1	4/27/2023 7:00:45 PM
Ethylbenzene	ND	0.048		mg/Kg	1	4/27/2023 7:00:45 PM
Xylenes, Total	ND	0.097		mg/Kg	1	4/27/2023 7:00:45 PM
Surr: 4-Bromofluorobenzene	96.2	70-130		%Rec	1	4/27/2023 7:00:45 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH28- 30-35

Project: Sullivan GC D 1E

Collection Date: 4/16/2023 4:30:00 PM

Lab ID: 2304848-011

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: PRD
Diesel Range Organics (DRO)	10	10		mg/Kg	1	4/25/2023 5:01:26 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	4/25/2023 5:01:26 PM
Surr: DNOP	93.3	69-147		%Rec	1	4/25/2023 5:01:26 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/27/2023 7:24:14 PM
Surr: BFB	107	37.7-212		%Rec	1	4/27/2023 7:24:14 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/27/2023 7:24:14 PM
Toluene	ND	0.049		mg/Kg	1	4/27/2023 7:24:14 PM
Ethylbenzene	ND	0.049		mg/Kg	1	4/27/2023 7:24:14 PM
Xylenes, Total	ND	0.098		mg/Kg	1	4/27/2023 7:24:14 PM
Surr: 4-Bromofluorobenzene	97.1	70-130		%Rec	1	4/27/2023 7:24:14 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2304848

Date Reported: 4/28/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: BH28- 40-45

Project: Sullivan GC D 1E

Collection Date: 4/16/2023 5:00:00 PM

Lab ID: 2304848-012

Matrix: SOIL

Received Date: 4/20/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>						Analyst: PRD
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	4/25/2023 5:22:46 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	4/25/2023 5:22:46 PM
Surr: DNOP	98.0	69-147		%Rec	1	4/25/2023 5:22:46 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	4/27/2023 7:47:32 PM
Surr: BFB	111	37.7-212		%Rec	1	4/27/2023 7:47:32 PM
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: JJP
Benzene	ND	0.024		mg/Kg	1	4/27/2023 7:47:32 PM
Toluene	ND	0.047		mg/Kg	1	4/27/2023 7:47:32 PM
Ethylbenzene	ND	0.047		mg/Kg	1	4/27/2023 7:47:32 PM
Xylenes, Total	ND	0.095		mg/Kg	1	4/27/2023 7:47:32 PM
Surr: 4-Bromofluorobenzene	98.1	70-130		%Rec	1	4/27/2023 7:47:32 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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

WO#: 2304848

28-Apr-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>MB-74530</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>						
Client ID: <b>PBS</b>	Batch ID: <b>74530</b>			RunNo: <b>96291</b>						
Prep Date: <b>4/25/2023</b>	Analysis Date: <b>4/25/2023</b>			SeqNo: <b>3486988</b>		Units: <b>%Rec</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	7.7		10.00		77.3	69	147			

Sample ID: <b>LCS-74530</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>74530</b>			RunNo: <b>96291</b>						
Prep Date: <b>4/25/2023</b>	Analysis Date: <b>4/25/2023</b>			SeqNo: <b>3486989</b>		Units: <b>%Rec</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.0		5.000		80.5	69	147			

Sample ID: <b>MB-74487</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>						
Client ID: <b>PBS</b>	Batch ID: <b>74487</b>			RunNo: <b>96290</b>						
Prep Date: <b>4/21/2023</b>	Analysis Date: <b>4/24/2023</b>			SeqNo: <b>3487633</b>		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								
Surr: DNOP	8.1		10.00		81.0	69	147			

Sample ID: <b>LCS-74487</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>74487</b>			RunNo: <b>96290</b>						
Prep Date: <b>4/21/2023</b>	Analysis Date: <b>4/24/2023</b>			SeqNo: <b>3487634</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	10	50.00	0	86.2	61.9	130			
Surr: DNOP	4.3		5.000		85.1	69	147			

Sample ID: <b>2304848-007AMS</b>	SampType: <b>MS</b>			TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>						
Client ID: <b>BH26- 30-35</b>	Batch ID: <b>74548</b>			RunNo: <b>96314</b>						
Prep Date: <b>4/25/2023</b>	Analysis Date: <b>4/25/2023</b>			SeqNo: <b>3488005</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	49.75	11.77	81.2	54.2	135			
Surr: DNOP	5.0		4.975		99.7	69	147			

Sample ID: <b>2304848-007AMSD</b>	SampType: <b>MSD</b>			TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>						
Client ID: <b>BH26- 30-35</b>	Batch ID: <b>74548</b>			RunNo: <b>96314</b>						
Prep Date: <b>4/25/2023</b>	Analysis Date: <b>4/25/2023</b>			SeqNo: <b>3488006</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	49.90	11.77	78.2	54.2	135	2.67	29.2	

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2304848

28-Apr-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>2304848-007AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>BH26- 30-35</b>	Batch ID: <b>74548</b>	RunNo: <b>96314</b>								
Prep Date: <b>4/25/2023</b>	Analysis Date: <b>4/25/2023</b>	SeqNo: <b>3488006</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.1		4.990		101	69	147	0	0	

Sample ID: <b>LCS-74548</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>74548</b>	RunNo: <b>96314</b>								
Prep Date: <b>4/25/2023</b>	Analysis Date: <b>4/25/2023</b>	SeqNo: <b>3488048</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	93.5	61.9	130			
Surr: DNOP	4.5		5.000		90.6	69	147			

Sample ID: <b>MB-74548</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>74548</b>	RunNo: <b>96314</b>								
Prep Date: <b>4/25/2023</b>	Analysis Date: <b>4/25/2023</b>	SeqNo: <b>3488050</b>	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								
Surr: DNOP	9.1		10.00		91.0	69	147			

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2304848

28-Apr-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>lcs-74483</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8015D: Gasoline Range</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>74483</b>			RunNo: <b>96277</b>						
Prep Date: <b>4/21/2023</b>	Analysis Date: <b>4/24/2023</b>			SeqNo: <b>3486417</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	92.2	70	130			
Surr: BFB	5400		1000		537	37.7	212			S

Sample ID: <b>mb-74483</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8015D: Gasoline Range</b>						
Client ID: <b>PBS</b>	Batch ID: <b>74483</b>			RunNo: <b>96277</b>						
Prep Date: <b>4/21/2023</b>	Analysis Date: <b>4/24/2023</b>			SeqNo: <b>3486418</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1200		1000		115	37.7	212			

Sample ID: <b>lcs-74524</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8015D: Gasoline Range</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>74524</b>			RunNo: <b>96350</b>						
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>			SeqNo: <b>3489752</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.2	70	130			
Surr: BFB	5000		1000		503	37.7	212			S

Sample ID: <b>mb-74524</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8015D: Gasoline Range</b>						
Client ID: <b>PBS</b>	Batch ID: <b>74524</b>			RunNo: <b>96350</b>						
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>			SeqNo: <b>3489753</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1100		1000		105	37.7	212			

Sample ID: <b>2304848-007ams</b>	SampType: <b>MS</b>			TestCode: <b>EPA Method 8015D: Gasoline Range</b>						
Client ID: <b>BH26- 30-35</b>	Batch ID: <b>74524</b>			RunNo: <b>96350</b>						
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>			SeqNo: <b>3490723</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	4.8	24.15	0	79.9	70	130			
Surr: BFB	4800		966.2		499	37.7	212			S

Sample ID: <b>2304848-007amsd</b>	SampType: <b>MSD</b>			TestCode: <b>EPA Method 8015D: Gasoline Range</b>						
Client ID: <b>BH26- 30-35</b>	Batch ID: <b>74524</b>			RunNo: <b>96350</b>						
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>			SeqNo: <b>3490724</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2304848

28-Apr-23

Client: HILCORP ENERGY  
Project: Sullivan GC D 1E

Sample ID: 2304848-007amsd		SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BH26- 30-35		Batch ID: 74524		RunNo: 96350						
Prep Date: 4/24/2023		Analysis Date: 4/27/2023		SeqNo: 3490724		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.8	24.08	0	87.4	70	130	8.61	20	
Surr: BFB	4900		963.4		509	37.7	212	0	0	S

Qualifiers:

- \*

Value exceeds Maximum Contaminant Level.
- D

Sample Diluted Due to Matrix
- H

Holding times for preparation or analysis exceeded
- ND

Not Detected at the Reporting Limit
- PQL

Practical Quantitative Limit
- S

% Recovery outside of standard limits. If undiluted results may be estimated.
- B

Analyte detected in the associated Method Blank
- E

Above Quantitation Range/Estimated Value
- J

Analyte detected below quantitation limits
- P

Sample pH Not In Range
- RL

Reporting Limit



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

WO#: 2304848

28-Apr-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>LCS-74483</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>74483</b>			RunNo: <b>96277</b>						
Prep Date: <b>4/21/2023</b>	Analysis Date: <b>4/24/2023</b>			SeqNo: <b>3486451</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.87	0.025	1.000	0	87.1	80	120			
Toluene	0.91	0.050	1.000	0	90.8	80	120			
Ethylbenzene	0.92	0.050	1.000	0	91.7	80	120			
Xylenes, Total	2.8	0.10	3.000	0	92.1	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		103	70	130			

Sample ID: <b>mb-74483</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>PBS</b>	Batch ID: <b>74483</b>			RunNo: <b>96277</b>						
Prep Date: <b>4/21/2023</b>	Analysis Date: <b>4/24/2023</b>			SeqNo: <b>3486452</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.99		1.000		98.5	70	130			

Sample ID: <b>LCS-74524</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>LCSS</b>	Batch ID: <b>74524</b>			RunNo: <b>96350</b>						
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>			SeqNo: <b>3489755</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	92.3	80	120			
Toluene	0.94	0.050	1.000	0	94.0	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.2	80	120			
Xylenes, Total	2.9	0.10	3.000	0	95.5	80	120			
Surr: 4-Bromofluorobenzene	0.98		1.000		98.4	70	130			

Sample ID: <b>mb-74524</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>PBS</b>	Batch ID: <b>74524</b>			RunNo: <b>96350</b>						
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>			SeqNo: <b>3489757</b>		Units: <b>mg/Kg</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.97		1.000		97.1	70	130			

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2304848

28-Apr-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>2304848-008ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>BH26- 40-42.5</b>	Batch ID: <b>74524</b>	RunNo: <b>96350</b>								
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>	SeqNo: <b>3490733</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.87	0.024	0.9699	0	89.4	68.8	120			
Toluene	0.90	0.048	0.9699	0.01660	91.1	73.6	124			
Ethylbenzene	0.90	0.048	0.9699	0	93.2	72.7	129			
Xylenes, Total	2.8	0.097	2.910	0.05415	92.8	75.7	126			
Surr: 4-Bromofluorobenzene	0.94		0.9699		97.3	70	130			

Sample ID: <b>2304848-008amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>BH26- 40-42.5</b>	Batch ID: <b>74524</b>	RunNo: <b>96350</b>								
Prep Date: <b>4/24/2023</b>	Analysis Date: <b>4/27/2023</b>	SeqNo: <b>3490734</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.80	0.024	0.9653	0	83.0	68.8	120	7.83	20	
Toluene	0.83	0.048	0.9653	0.01660	84.8	73.6	124	7.52	20	
Ethylbenzene	0.85	0.048	0.9653	0	88.0	72.7	129	6.17	20	
Xylenes, Total	2.6	0.097	2.896	0.05415	86.6	75.7	126	7.28	20	
Surr: 4-Bromofluorobenzene	0.94		0.9653		97.6	70	130	0	0	

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2304848

RcptNo: 1

Received By: Tracy Casarrubias 4/20/2023 6:30:00 AM

Completed By: Tracy Casarrubias 4/20/2023 6:56:53 AM

Reviewed By: *W 4/20/23*

### Chain of Custody

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

### Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4$ " for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted? \_\_\_\_\_

Checked by: *W 4/20/23*

### Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: Mailing address and phone number missing on COC- TMC 4/20/23

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.4	Good	Yes	Morty		

## Chain-of-Custody Record

Client: LI-1500

Hilcorp

Attn: Kate Kaufman

**Mailing Address:**

**Turn-Around Time:**

5-day

☒ Standard ☐ Rush

Project Name: Sullivan GLD#1E

Project #: 0741988029

Phone #:

email or Fax#: KKauffman@bi/corp.com

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)


Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☐ EDD (Tyne)[illegible]

Date	Time	Matrix	Sample Name
4/15/23	1400	50:1	BH24-37-38
	1405		BH24-30-35
	1409		BH24-25-30
	1730		BH25-35-40
	1735		BH25-30-35
	1738		BH25-44-45
4/16/23	1115		BH26 30-35
	1136		BH26 40-42.5
	1340		BH27 30-35
	1355		BH27 35-40
	1630		BH28 30-35
	1700		BH28 40-45

Relinquished by:

Relinquished by: 

Relinquished by:

Relinquished by: Christ Waver

Received by:

Via: \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

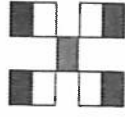
Received by:

Via Column

Date \_\_\_\_\_ Time \_\_\_\_\_

Remarks:

CC: chanson @ erasmus.com  
e carroll



## HALL ENVIRONMENTAL ANALYSIS LABORATORY

[www.hallenvironmental.com](http://www.hallenvironmental.com)

4901 Hawkins NE - Albuquerque, NM 87109

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

## Analysis Request

	X	BTEX / MTBE / TMB's (8021)	
	X	TPH-8015D(GRO / DRO / MRO)	
8081 Pesticides/8082 PCB's		EDB (Method 504.1)	
PAHs by 8310 or 8270SIMS		RCRA 8 Metals	
Cl, F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub>		8260 (VOA)	
8270 (Semi-VOA)		Total Coliform (Present/Absent)	

Remarks:

CC: chanson @ erasmus.com  
e carroll





## APPENDIX B

# Boring Logs with Well Construction Diagrams

---



WSP USA INC  
848 East 2nd Avenue  
Durango, CO 81301

☐ = sand  
☒ = bentonite  
|| = blank  
≡ = screen

# **BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>MW13</b>	Project: <b>Sullivan GCD#1/E</b>
Date: <b>9-20-21</b>	Project Number: <b>PE-7821015</b>
Logged By: <b>Josh Adams</b>	Drilled By: <b>Environmental Works</b>
Drilling Method: <b>Sonic</b>	Sampling Method: <b>Continuous</b>
Seal: <b>Bentonite 18-0'</b>	Grout: <b>Bentonite</b>
Casing Type: <b>Schedule 40 PVC</b>	Hole Diameter: <b>6"</b>
Screen Type: <b>Schedule 40 PVC</b>	Depth to Liquid: <b>26'</b>
Slot: <b>0.010"</b>	Depth to Water: <b>26'</b>
Diameter: <b>2"</b>	Total Depth: <b>35'</b>
Length: <b>20'</b>	
Length: <b>30-20 10'</b>	

Elevation: <b>AS445 5455</b>	Detector: <b>PID</b>
Gravel Pack: <b>10-20 Silica Sand 30-18'</b>	

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0					
					1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					
					11					
					12					
					13					
					14					
					15					

WSP USA INC 848 East 2nd Avenue Durango, CO 81301					Boring/Well # MW13		Project Sullivan		Project # 01782005		Date 9-20-21	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks		Well Completion	
					15			SM	SAA			
					16						xx	
					17			SW-SM	brown well graded sand w/ silt		xx	
	M	0.9	NO		18				low plas/cohesion		xx	
					19	16-26			no stain/adn		xx	
					20							
					21							
	M	1.3	NO		22			SW-SM	SAA w/ some intermixd gravel			
					23							
				MW13 @ 26' 164	24				some fell out of sampler @ 26', PID			
					25				SAA GW 3946			
	SAT	1.3	NO		26			SW-SM	encountered			
				27-30'	27				26' @			
					28				many large cobbles			
					29	26-35		CH	grey clay stone			
	DTY	2.4	NO		30				high plas/cohesion			
					31							
					32							
				MW13 @ 30-35 1609	33				SAA			
	DTY	2.4	NO		34							
					35							
					36				TDE 35'			
					37							

Backfill w/ bentonite/  
Sand to 30'

Released to Imaging: 7/30/2024 12:55:17 PM



WSP										Boring/Well #	MW14
										Project:	Sullivan GCD#1E
										Project #	TE017621005
										Date	9-18-21
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion	
					15						
					16				SAA		
	Slightly moist	20.1			17	15-20'					
				MW14 @ 15-20'	18						
					19				@ 19.5' Dark gray stained soil in end of sampler		
	Wet	1,094		MW14 @ 20-21'	20				20-21': Wet, SAND, dark gray stained, strong petroleum odor, well sorted		
					21						
	Dry	546			22	20-25'			21-24': Dry, silty, CLAY, petroleum odor, no staining		
					23						
					24						
	Wet	986			25				24-28': Wet, SAND, dark gray stained, well sorted, strong petroleum odor		
					26						
					27						
					28	25-30'			28-35': Dry, CLAY/CLAYSTONE, gray, no staining, slight petroleum odor from 28-32'		
					29						
					30						
	Dry	546			31						
					32						
					33	30-35'			No odor 32-40'		
					34						
					35						
	Dry	19.3		MW14 @ 35-40'	36	35-40'					
					37						

wsp									Boring/Well #	MW14
									Project:	Sullivan GLD #1E
									Project #	TE017821005
									Date	9-18-21
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					37					
					38					
	Dry	19.3			39					
					40					
					41					
					42					
					43					
					44					
					45					
					46					
					47					
					48					
					49					
					50					
					51					
					52					
					53					
					54					
					55					
					56					
					57					
					58					
					59					

SAA, increased sand  
35-40'

EOB @ 40'



WSP USA INC

848 East 2nd Avenue  
Durango, CO 81301

☐ = sand

|| = blank

☒ = bentonite

☐ = sand

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>MW15</b>	Project: <b>Sullivan GCD #12</b>
Date: <b>9-20-21</b>	Project Number: <b>TE017821005</b>
Logged By: <b>Josh Adams</b>	Drilled By: <b>Environmental Works</b>
Drilling Method: <b>Sonic</b>	Sampling Method: <b>Continuous</b>
Seal: <b>Bentonite 18-0</b>	Grout: <b>Bentonite</b>
Casing Type: <b>Schedule 40 PVC</b>	Diameter: <b>2" 20-0 20</b>
Screen Type: <b>Schedule 40 PVC</b>	Diameter: <b>2" 30-20 10</b>
Gravel Pack: <b>10-20 Silica Sand 30-18'</b>	Hole Diameter: <b>6"</b>
Detector: <b>PID</b>	Depth to Liquid: <b>26</b>
Elevation: <b>5455</b>	Slot: <b>0.010"</b>
	Total Depth: <b>35</b>
	Depth to Water: <b>26</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0					<del>Bottom</del> stick / up
					1				brown silty sand	X
					2	0-6			low coh / plas. no stain / ocl.	X
					3			SM	10 YR 5/4	X
					4					X
					5					X
					6					X
					7			S&W - grey / brown well graded sand		X
					8			10R5/1 no/s w/silt		X
					9	6-16			10 YR 5/4 brown silty sand	X
					10				no s/o	X
					11					X
					12					X
					13					X
					14			SAA		X
					15					X

WSP USA INC 848 East 2nd Avenue Durango, CO 81301								Boring/Well #	MWIS	
								Project:	Sullivan	
								Project #	TECHNICAL	
								Date	9-20-21	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15	616		SM	SAA	X
					16					X
					17			CL	red brown / grey lean clay 10 YR 5/1 high plas/coh no s/l	X
	Dry 3.1		NO		18					X
					19					
					20			SM	well graded sand w/silt brownish red, low plas/cohesion	
					21				no stain/odor w/ many large cobbles	
	Dry	116.0	NO	MWIS C 20-25 1538	22					
					23					
					24	16-25				
					25			SM	silty sand w/ cobbles	
	Wet	226	Yes	MWIS C 26-28 1600	26				C 25-26' some wet sand, has HC odor some gray staining	
		724.3	grey	26-28	27				grey stain, well sorted sand w/ many cobbles	
	Wet	1048.0	CS		28				28-30' NO stain, lower PID	
			grey	28-30	29					
	Wet	17.8	NO		30	23				
					31			CH	grey dastone	
					32					
					33					
	Dry	10	NO	MWIS C 30-35 1537	34				SAA, no s/l	
					35					
					36				TDC 35'	
					37					

Backfill to 30' w/sand bentonite

Released to Imaging: 7/30/2024 12:55:17 PM



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848 East 2nd Avenue

Durango, CO 81301

☐ = sand      11 = blank  
☒ = bentonite      E = screen

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: <b>MW16</b>	Project: <b>Sullivan OCD #18</b>
Date: <b>9-20-21</b>	Project Number: <b>TEST 161015</b>
Logged By: <b>Josh Adams</b>	Drilled By: <b>Environmental Works</b>
Drilling Method: <b>Sonic</b>	Sampling Method: <b>Continuous</b>
Gravel Pack: <b>10-20 Silica Sand</b>	Seal: <b>Bentonite</b>
Casing Type: <b>Schedule 40 PVC</b>	Hole Diameter: <b>6"</b>
Screen Type: <b>Schedule 40 PVC</b>	Depth to Liquid: <b>27</b>
Detector: <b>PID</b>	Grout: <b>Bentonite</b>
Elevation: <b>5,815</b>	Diameter: <b>2"</b>
Slot: <b>0.010"</b>	Length: <b>20'</b>
	Total Depth: <b>27</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0					
					1			SM	well graded sand w/silt	X
					2				NO S/O	X
					3			SM	brown silty sand	X
					4				low plasticity	X
					5		0-10		NO S/O 10YR 5/4	X
					6				some gravel	X
					7					X
					8			SM/CH	SAA, bottom 2"	X
					9				have intermixed white clays	X
					10					X
					11					X
					12				SAA, no clay	X
					13			SM	Some grey colored SM	X
					14					X
					15					X



WSP USA INC 848 East 2nd Avenue Durango, CO 81301								Boring/Well #	MW16	
								Project:	Waste Sullivan	
								Project #	05-2017-0005	
								Date	9-20-21	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16					X
					17	10-20		SM	SAT	X
	Dry	0.6	NO		18					X
					19			CL	Brown lean clay no s/o red High plas/coh	X
					20			SM	brown silty sand	
	M	0.6	NO		21					
					22			SW/SM	well graded sand w/silt	
	UM	0.2	NO		23					
					24	20-30		CL	brown lean clay	
					25					
					26			SW-SM	well graded sand w/silt	
	SAT	1.6	NO	MW16 25-30 1716	27	▽			SAT no s/o	
					28					
					29				GW @ 28', large obbles intermixed w/ SW-SM	
					30					
					31				grey claystone	Backfill
	Dry	0.6	NO	MW16 30-35 1714	32	30-35		CH	high plas/cohesion no s/o	to
					33					30'
					34					w/
					35					sand/
					36					bentonite
					37				TD @ 35	



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 □ = sand    ▣ = bentonite    || = screen

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>MW17</b>	Project: <b>Sullivan GC D#1E</b>
Date: <b>4-21-21</b>	Project Number: <b>T2017821005</b>
Logged By: <b>JA</b>	Drilled By: <b>Environmental Works</b>

Elevation: <b>5,455</b>	Detector: <b>PID</b>	Drilling Method: <b>Sonic</b>	Sampling Method: <b>Continuous</b>
Gravel Pack: <b>10/20 sand 29-17'</b>		Seal: <b>Bentonite 17-0</b>	Grout: <b>-Bentonite /</b>
Casing Type: <b>2" Sch. 40 PVL</b>		Diameter: <b>2" 19-0</b>	Hole Diameter: <b>6"</b>
Screen Type: <b>2" Sch. 40 PVL</b>		Length: <b>10'</b>	Depth to Liquid: <b>24</b>
Slot: <b>0.010"</b>		Diameter: <b>2" 29-19</b>	Depth to Water: <b>24</b>
Total Depth: <b>30'</b>			

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0					
					1			SM	brown silty sand	X
					2				no s/o low plas/cohesion	X
					3				some intermixed gravel	X
					4	0-7			@ 4-5'	X
					5				7.5 YR 5/4	X
					6					X
					7					X
					8	7-10		SM	SAA	X
					9					X
					10					X
					11					X
					12			CL	brown lean clay no s/o	X
					13	10-15'			high plas/cohesion	X
					14			SM	brown silty sand	X
					15					X



Boring/Well # **MW17**  
 Project: **Sullivan**  
 Project # **TE017821005**  
 Date **9-21-21**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15					
					16	10-20		SM		X
					17				SAA	X
	M	0.8	NO		18					X
					19					
					20			SP-SM	poorly graded sand w/ silt no s/o	
					21					
	UM	0.3	NO		22				GLW @ 24'	
					23					
					24				SAA w/ many large cobbles	
	SAT	2.7		MW17 24-25' 0950	25	20-30		SP-SM		
	SAT				26					
					27				SAA	
	SAT	12			28					
					29			CH	gray claystone very compact, high plasticity. no s/o	
	Dry	1.8		MW17 29-30' 0948	30					backfill w/ 24' w/sand
					31				TD @ 30'	
					32				No observed impacts	
					33					
					34					
					35					
					36					
					37					



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring Well Number: <b>MW18</b>	Project: Sullivan GC D#1E
Date: <b>9-21-21</b>	Project Number: <b>18017921005</b>
Logged By: <b>JA</b>	Drilled By: Environmental Works
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: <b>10/20 sand 30-18</b>	Seal: Bentonite <b>18-0</b>
Casing Type: <b>Sch. 40 PVC</b>	Grout: Bentonite
Screen Type: <b>u</b>	Diameter: <b>2"</b>
Slot: <b>0.010"</b>	Length: <b>20'</b>
	Hole Diameter: <b>6"</b>
	Depth to Liquid: <b>~24'</b>
	Total Depth: <b>35</b>
	Depth to Water: <b>~24'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0				brown silty sand, med comp	
					1			SM	no s/o 7.5 YR 4/6	X
					2	0-4				X
					3			CL	grey/white sandy lean clay	X
					4				no s/o 7.5 YR 5/4	X
					5	4-9				X
					6					X
					7				SAA	X
					8			CL		X
					9					X
					10	4-15		SM	brown silty sand w/ intermix	X
					11				white clay no s/o	X
					12					X
					13					X
					14			SM	SAA	X
					15					X

wsp										Boring/Well #	MW18
										Project	Sullivan
										Project #	TE017821005
										Date	9-21-21
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion	
					15						
					16						
					17						
	M	1.5	NO		18	15-20		SM	SAA		
					19						
					20						
	M	51.3	Yes	MW18 @ 20-22' 1541	21				black/grey poorly graded sand w/ silt, many cobbles strong HC odor, grey/black stained		
		(20-22)	Black		22						
					23			SP-SM			
	M	206	Yes	MW18 @ 22-25' 1542	24	20-29			turns grey @ 22-25'		
		(22-25)	grey		25						
					26						
					27						
	M	9.4	NO		28			SM	brown silty sand		
		(25-30)			29						
					30						
					31				grey claystone high plas/coh.		
					32						
	Dry	5.6	NO	MW18 @ 30-35' 1540	33				SAA		
					34						
					35						
					36				TD @ 35'		
					37						

backfill to 30' w/ sand





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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: <b>BH19 MW-19</b>	Project: Sullivan GC D#1E
Date: <b>4-22-21</b>	Project Number: <b>TE017821005</b>
Logged By: <b>Reece Hansen</b>	Drilled By: Environmental Works
Elevation: <b>5,455</b>	Detector: PID
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: <b>10/20 sand 30-13</b>	Seal: Bentonite 13-0
Casing Type: <b>2" Sch. 40 PVC</b>	Grout: Bentonite
Screen Type: " "	Slot: <b>0.010"</b>
Diameter: <b>2"</b>	Length: <b>15' S.V.</b>
Hole Diameter: <b>6"</b>	Depth to Liquid: <b>20'</b>
Total Depth: <b>35</b>	Depth to Water: <b>20'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
				MW 19	0					
				BH19	1					
				@ 0-5	2	0-5		SW-SM	ten-ft. brown fine-med. sands w/silt NO S/O	
				0955	3					
					4					
					5					
				MW 19	6					
				BH19	7	5-10		SW-SM	SAA	
				@ 5-10	8					
				0958	9					
					10					
				MW 19	11				SAA	
				BH19	12	10-14				
				@ 10-14	13			SP-SC	mod. cohesion, gray-brown silt & clay NO S/O	
				1002	14					
					15					



Boring/Well # **BH-1024 MW-19**  
 Project **Sullivan GC D#1E**  
 Project # **TE017821005**  
 Date **9-22-21**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	59		MW-19 @ 14-17	15	14-17		SW-SM	unconsolidated med fine sand & silt	
				1005	16				band of gray, med. ss N 5/0	
				MW-19 @ 17-20	17				fine-med sand & silt	
	Dry	21.4		1008	18	17-20		SW	SAA	
	wet			MW-19 @ 20-25	19	20		SC	brown silt & clay, med cohesion bottom 2" becomes wet	
			yes gray/black	1010	20					
	moist	343		MW-19 @ 25-30	21	20-24		SW	med gray-dark unconsolidated sand, mod odor strong gray-black staining	
				1015	22					
				MW-19 @ 30-35	23					
				1020	24					
			yes gray/black		25	24-28		SW	SAA strong odor & staining	
	moist	>5000			26					
					27					
					28					
				MW-19 @ 30-35	29	28-31		SC	Transition to lt. gray claystone	
	Dry			1020	30					
					31					
		580			32	31-35			SAA,	
					33					
	Dry				34			SC		
				MW-19 @ 35'	35				TD @ 35', set slotted casing from 30-15'	
				1024	36					
					37					



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring Log Number: <b>SBP</b>	Project: Sullivan GC D#1E
Date: 9-21-21	Project Number: TE 017821005
Logged By: JA	Drilled By: Environmental Works
Elevation: 5,455	Detector: PID
Gravel Pack: 10/20 sand	Seal: Bentonite
Casing Type: Sch. 40 PVC	Grout: Bentonite
Screen Type: " "	Slot: 0.010"
Diameter: 2"	Length: 2'
Hole Diameter: 6"	Depth to Liquid: NA
Total Depth: 35	Depth to Water: ND

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0				brown silty sand, no s/c	
					1				med coh/plas	
					2			SM	@	
	Dry 0.6	NO			3	0-5			3-5 some intermixed white clay	
					4				7.5 YR 4/4	
					5					
					6					
					7			SM	SAA	
					8	5-10				
	Dry 1.1	NO			9					
					10					
					11					
					12			CL	white/gray sandy lean clay	
					13				hard, high plas/cohc	
	Dry 0.7	NO			14	10-16			no s/c 2.5 YR 5/3	
					15					

NO  
well  
dry



Boring/Well #

MW 5B17

Project

Sullivan

Project #

TE017821005

Date

9-21-21

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15	10-16		CL	SAA	
					16					
	M	0.3	NO		17	16-18		CL	SAA	
					18					
					19					
					20	18-20		CL	SAA, less sand, more clay	
					21					
					22					
	Dry	0.3	NO		23				SAA	
					24	22-27				
					25					
					26				grey claystone, no s/o very hard, high plasticity	NO well dry
					27					
	Dry	0.0	NO	MW14 @ 25-30" 1148	28	27-32			SAA	
					29					
					30					
					31					
					32					
	Dry		NO	MW14 @ 30-35" 1154	33				SAA	
					34					
					35					
					36					
					37				TD @ 35' no well set, *dry dry hole	



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring Well Number: <b>48-19 SB-18</b>	Project: Sullivan GC D#1E
Date: <b>9-22-21</b>	Project Number:
Logged By: <b>Reece Hansen</b>	Drilled By: Environmental Works

Elevation: <b>5455</b>	Detector: PID	Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: <b>NA</b>	Seal: <b>Bentonite</b>	Grout: <b>Bentonite</b>	
Casing Type: <b>NA</b>	Diameter: Length:	Hole Diameter: <b>6"</b>	Depth to Liquid: <b>NA</b>
Screen Type: <b>NA</b>	Slot: Diameter: Length:	Total Depth: <b>35</b>	Depth to Water: <b>NA</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0	No	<del>0-1</del>	0			GP-GM	unconsolidated sand, silt & cobbles / gravel No S/O	No well DRY
				<del>1-2</del>	1	0-4				
					2					
					3					
					4					
					5				SAA	
				<del>5-6</del>	6	4-8		SAA		
	Dry	0	No	<del>6-7</del>	7					
					8					
					9	8-10		SAA	SAA	
					10					
				<del>10-11</del>	11	10-13		SAA	SAA	
	Dry	0	No	<del>11-12</del>	12					
					13			SW	transitions to cleaner sand w/ some gravel No S/O	
					14	13-18		GP-GM	sand, silt & gravel, not consolidated No S/O	
					15					





Boring Well #

SB18

Project

Sullivan

Project #

TE017621005

Date

9-22-2021

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					15				unconsolidated sand + silt +	
					16	13-18		SP-SM	N 9/0	
	Dry	0	N	SB-18 @ 15-20	17			SL	med. consolidated silt + clays brown - dark gray No S/O	
					18					
					19					
					20				SAA	
					21	18-24		SM		
	Dry	0	N		22			GP-GC	SAA, some cobbles	
					23				clays are consolidated, mixed w/ unconsolidated silt	
					24					
					25					
				SB-18 @ 25-30	26			SL	med-dark gray siltstone to claystone. Homogeneous med. consolidated.	No well
	Dry	0	N	1155	27				No S/O	Dry
					28					
					29					
					30					
				SB-18 @ 30-35	31			SAA	SAA	
	Dry	0		1201	32					
					33					
					34					
					35				TD @ 35' @ 1145	
					36				Dry hole	
					37					



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**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>MW 20</b>		Project: <b>Sullivan GC D#1E</b>	
Date: <b>10-5-21</b>		Project Number:	
Logged By: <b>Reece Hansen</b>		Drilled By: <b>Environmental Works</b>	
Elevation:	Detector: <b>PID</b>	Drilling Method: <b>Sonic</b>	Sampling Method: <b>Continuous</b>
Gravel Pack:		Seal: <b>Bentonite</b>	Grout: <b>Bentonite</b>
Casing Type:	Diameter:	Length: <b>20 + S.M.</b>	Hole Diameter: <b>6"</b>
Screen Type:	Slot:	Diameter: <b>2"</b>	Length: <b>15'</b>
		Total Depth: <b>35'</b>	Depth to Liquid: <b>25'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0.8	N		0				sand, silt & gravel	
					1			SP-	No S/O	
					2	0-4		SM		
					3					
					4					
					5			SP-	unconsolidated sand, silt	
					6	4-8		SM	+ cobbles No S/O	
	Dry	0	N		7					
					8					
					9	8-10		SP-	SAA	
					10			SM		
					11				tan - lt. gray sand, med. -	
	Dry	0			12	10-15		SP-	course w/ silt & gravel	
					13			SM	No S/O	
					14					
					15					

wsp										Boring/Well #	MW 20
										Project:	
										Project #	
										Date	10-5-21
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion	
					15						
					16	15-20		SW-SM	unconsol. fine-med. sand some gravel No s/o		
					17						
					18						
					19						
					20						
					21			SW-SM	1 ft. gray sand & silt		
				MW20 @ 21-25	22	20-25		SC	brown sandy silt w/ clays		
					23						
					24						
					25						
					26			SW	med. gray, unconsolidated sand		
				MW20 @ 25-30	27				unconsolidated gray sand stained gray to black strong gasoline odor		
					28			SW			
					29						
					30						
					31			SW	SAA		
				MW20 @ 30-35	32						
					33				<del>transitions</del> transitions distinctly to fin unconsolidated sand, staining line visible, No s/o		
					34			SW			
					35						
					36			SW			
					37						



Boring/Well #

MW 20

Project:

Project #

Date

10-5-21

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	wet	20.5	N	MW20 @ 35-40	37	35-40		SW	clean tan uncons. sand w/ occasional gravel/cobbles. no s/o	
	dry		N		38					
					39			SC	bottom 1' banded w/ gray claystone dry, no s/o	
					40			SC		
					41			SC	TD @ 40', backfill to 35',	
					42				slotted casing 35-20', sand to 18'	
					43					
					44					
					45					
					46					
					47					
					48					
					49					
					50					
					51					
					52					
					53					
					54					
					55					
					56					
					57					
					58					
					59					

35-20 slotted

25-25



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**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>MW 21</b>		Project: <b>Sullivan GC D#1E</b>	
Date: <b>10-5-21</b>		Project Number:	
Logged By: <b>Reece Hansen</b>		Drilled By: <b>Environmental Works</b>	
Drilling Method: <b>Sonic</b>		Sampling Method: <b>Continuous</b>	
Gravel Pack:		Seal: <b>Bentonite</b>	
Casing Type:		Grout: <b>Bentonite</b>	
Screen Type:		Diameter:	Length: <b>20</b>
Slot:		Hole Diameter: <b>6"</b>	Depth to Liquid:
Diameter:		Length: <b>15'</b>	Depth to Water: <b>~25'</b>
Total Depth: <b>34'</b>			

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	6.5	N	-	0	0-5		SP-SM	Unconsol. sand, silt & rounded cobbles. tan to lk gray no s/o	
					1					
					2					
					3					
					4					
					5					
					6	5-10			SAA	
	Dry	22.6	N	MW 21 @ 5-10	7			SAA		
					8					
					9					
					10					
					11				tan, unconsol. fine to med. sand, ~10% silt,	
					12	10-15		SW	w/ rounded cobbles no s/o	
	Dry	3.3	N	-	13					
					14					
					15					



wsp										Boring/Well #	
										Project:	
										Project #	
										Date	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion	
					15				lt. brown v. fine sand & silt		
					16				clay content increases down section		
	dry	2.5	N		17	15-20		SC			
					18						
					19						
					20						
					21						
					22				gray & tan sand & silt		
				MW-21 @ 20-30	23	20-30		SC	banded w/ clay layers		
	dry	7.4	N		24				No S/O		
					25						
					26						
	moist				27				lower clay layers moist		
					28				N S/O		
					29						
					30						
					31	30-35		SW	tan - lt. brown unconsolidated sand		
	wet			MW-21 @ 30-35	32						
		0.2	N		33						
					34						
	dry				35			SC	hard-dry med. gray homogeneous clay		
					36				TD @ 35' well set @ 34'		
					37				screen from 34-39'		



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### BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: <b>5519 MW 22</b>		Project: <b>Sullivan GC D#1E</b>	
Date: <b>10-6-21</b>		Project Number:	
Logged By: <b>Reece Hansen</b>		Drilled By: <b>Environmental Works</b>	
Drilling Method: <b>Sonic</b>		Sampling Method: <b>Continuous</b>	
Gravel Pack:		Grout: <b>Bentonite</b>	
Elevation:	Detector: <b>PID</b>	Diameter:	Length: <b>20 + S.O.</b>
Casing Type:		Hole Diameter: <b>6"</b>	Depth to Liquid:
Screen Type:		Diameter:	Length: <b>15'</b>
Slot:		Total Depth: <b>35'</b>	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.0	N	-	0			SP-SM	tan fine-mid. sand w/ silt + occ. gravel NO S/O	
					1					
					2	0-5				
					3					
					4					
					5					
					6				SA	
	dry	0	N	-	7	5-10		SMA		
					8					
					9					
					10					
					11				SA	
	dry	0	N	-	12	10-13		SAA		
					13					
					14					
					15			SW-SM	v fine to med sand w/ silt reddish brown	

WSP										Boring/Well #	MW-22
										Project	
										Project #	
										Date	10-6-21
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion	
	Dry		No	MW 22 @ 15-20	15			SW SM	SAA		
					16	15-20					
					17						
					18			GP GM	tan - med gray fine to coarse sand w silt & increasing rounded cobbles		
	silt moist				19						
					20						
					21	20-25		SAA	SAA		
		70.1	No	MW 22 @ 20-25	22						
					23						
					24						
					25						
	silt moist		No	MW 22 @ 25-30	26	25-30		SAA	SAA		
					27	30					
		75000			28						
					29						
	Dry		Yes		30			SC	Dry lt. gray clay. cons. pieces moist on inside with black & yellowish staining / coloration		
		75000		MW 22 @ 30-35	31			SW SC	mod - strong color		
			Yes		32	30-35			Dry med. gray sand & silt clay unconsolidated w/ black staining in clay pieces		
					33						
	Dry	6.2	NO	MW 22 @ 32.5-35	34			SC	lt. gray to tan dry clay. hard		
					35				NO S/O		
					36						
					37				TD @ 35'		



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**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>MW 23</b>	Project <b>Sullivan GC D#1E</b>
Date <b>10-6-21</b>	Project Number:
Logged By: <b>Reece Hansen</b>	Drilled By: <b>Environmental Works</b>
Elevation:	Detector: <b>PID</b>
Gravel Pack:	Drilling Method: <b>Sonic</b>
Casing Type:	Seal: <b>Bentonite</b>
Screen Type:	Grout: <b>Bentonite</b>
Diameter:	Length: <b>20 + S.I.U.</b>
Hole Diameter: <b>6"</b>	Depth to Liquid: <b>~22.5'</b>
Slot:	Diameter:
Length: <b>15'</b>	Total Depth: <b>35'</b>
Depth to Water: <b>~22.15'</b>	

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					0					
					1			SW	Fine - med. tan sand unconsolidated	
	Dry	0	N		2	0-5			N/S/D	
					3				med - coarse sand w/ cobbles	
					4			SP	N S/D	
					5					
					6				Fine - med sand, silt	
	Dry	0	N		7	5-10		SP-SM	+ occasional cobbles unconsolidated.	
					8				tan - 1/2 brown	
					9				NO S/D	
					10					
	Dry	0	N		11	10-15		SAA	SAA	
					12					
					13					
					14					
					15					

WSP										Boring/Well #	MW 23	
										Project:		
										Project #		
										Date	10-6-21	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion		
					15							
					16	15-20		SP	Fine-med. sand banded w/ coarse - cobbles/gravel			
	Dry	0	N		17				tan - lt gray			
					18				N S/O			
					19							
					20							
	Dry		NO		21	20-25		SM	silt + sand			
				MW 23 @ 20-25	22							
	Wet	142	Y		23			CH	Wet gray-brown clay			
					24			Far clay	High plasticity binds up dark gray-black, silt odor			
					25							
	Wet	>5000	X	MW 23 @ 25-30	26	25-30		SW	unconsolidated wet sand			
					27				dark gray, strong odor			
					28				very stained w/ black			
					29							
					30							
					31	30-35		SW	SAA			
				MW 23 @ 30-35	32							
	Wet	>5000	N		33			SW	distinct transition to unstained sand, med. odor			
					34							
					35			SC	large cobbles + clay			
					36	35-40						
	Dry	>5000			37							



wsp										Boring/Well #	MW 23	
										Project:		
										Project #		
										Date	10-6-21	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion		
	Dry	5000	Y	MW23 @ 35-40	37	37-40		CL	gray dry clay banded w/ darker gray black staining. mod. odor			
					38							
					39							
					40							
					41				homogeneous gray clay			
	Dry	24	N	MW23 @ 40-45	42	40-45		CL	N 9/10			
					43				spot sample taken from			
					44				more consolidated piece @			
					45				42.5' to @ 45'			
					46				well set @ 35', slotted casing to 20'			
					47							
					48							
					49							
					50							
					51							
					52							
					53							
					54							
					55							
					56							
					57							
					58							
					59							




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**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SB19</b>		Project: <b>Sullivan GC D#1E</b>	
Date: <b>10-6-21</b>		Project Number:	
Logged By: <b>Reece Hanson</b>		Drilled By: <b>Environmental Works</b>	
Elevation:	Detector: <b>PID</b>	Drilling Method: <b>Sonic</b>	Sampling Method: <b>Continuous</b>
Gravel Pack:		Seal: <b>Bentonite</b>	Grout: <b>Bentonite</b>
Casing Type:	Diameter:	Length:	Hole Diameter: <b>6"</b> Depth to Liquid: _____
Screen Type:	Slot: <b>Back Fill</b>	Diameter:	Length:
		Total Depth: <b>36'</b>	Depth to Water: _____

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0			0				off wht. to lt. gray silty. consol. sand fine to med.	
					1			SW	well sorted no S/O	
					2	0-5				
					3					
					4					
					5					
					6			SW	med - coarse sand w/ some cobbles	
	Dry	0			7			SM	off wht. to lt. gray	
					8	5-10			No S/O	
					9					
					10					
					11				SAA	
	Dry	1.3			12					
					13			SL	laminated red brown sand lt. gray clay + more glassic gray-green clay w/ silt	
					14					
					15					

wsp										Boring/Well #	
										Project:	
										Project #	
										Date	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion	
					15				homogeneous v fine sand & silt with increasing clay down section		
	silt moist	0	N		16	15-					
					17	20		SC	gray-green with bands of orange rust		
					18						
					19						
					20						
					21				med gray homogeneous clay		
					22	20-		CL	No S/O		
	dry	67			23	26					
					24						
					25						
	silt moist				26			CH	slightly darker silt. moist high plasticity No S/O		
					27						
					28			CL	med gray homogeneous clay & silt dry		
	dry	13.0			29				No S/O		
					30						
					31						
					32						
	dry	0			33			CL	SAA		
					34						
					35						
					36						
					37				TD @ 36' Backfill		




					Client: HILCORP Project Name: SULLIVAN GC D #1E Project Location: Project Manager: STUART HYDE		BORING LOG NUMBER <b>BH 24</b> Project No.:	
Date Sampled: 4/15/23 Drilled By: <b>EO Cascade</b> Driller: <b>Jason</b> Logged By: <b>Reece Hansen</b>					Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:		Borehole Diameter: 6" Casing Diameter: 2" Well Materials: <b>PVC</b> Surface Completion: Boring Method: <b>Soa'c</b>	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIAL METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION	
0								
1	0-5					fine silty sand + fine-med. sand w/ occasional angular gravel N 5/0		
2		100	0.8	dry				
3								
4								
5								
6	5-10					lt brown, poorly graded fine-med sand w/ silt, N. 5/0 slightly consolidated		
7		100	0	dry				
8								
9								
10								
11	10-15					lt. brown to tan fine-med sand w/ silt, gets siltier toward 15'. No 5/0		
12		75	0	dry				
13								
14								
15	15-20					lt brown to grayish fine-med sand w/ silt some cohesive pieces grades down to well sorted fine v. fine sand No 5/0		
16		100	0	dry				
17								
18								
19								
20	20-25					tan/red, fine sand + silt grading to mostly silt @ 22.5 No 5/0		
21		100	0	dry				
22								
23								
24								
25								

Ground


Burbank plug


sand




					Client: HILCORP Project Name: SULLIVAN GC D #1E Project Location: Project Manager: STUART HYDE		BORING LOG NUMBER 13124	
Date Sampled: 4/15/23 Drilled By: Cascade Driller: Janna Logged By: Reese Hanson					Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:		Borehole Diameter: 2 1/2" Casing Diameter: 2 1/2" Well Materials: PVC Surface Completion: Boring Method: Sonic	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIAL-METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION	
25						gray - brown silt w/ clay		
26						well sorted fine-medium sand		
27	25-30	100	0	silt		tan		
28	30-32			must		gray brown silty sand w/ some fines, low cohesion, No S/O		
29	1409							
30								
31			2928	Wet (GW)		most gray to black stained sand, w/ some tan unstained sand grading down to gray/black stained sand-silt-clay, low cohesion		
32	30-35	100		~32'		Strong odor		
33	35-38					tan sand, No stain		
34	1405					gray-green mod. consolidated silt/clay		
35								
36								
37		100	118	Wet must		gray, dry silt + fines		
38	32-38			dry		silt cohesive		
39	70							
40						TD @ 38'		
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								



					Client: HILCORP Project Name: SULLIVAN GC D #1E Project Location: Project Manager: STUART HYDE		BORING LOG NUMBER BH 25 Project No.:	
Date Sampled: 4/15/23 Drilled By: Carcade Driller: Jason Logged By: Reece Hanson					Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:		Borehole Diameter: 6" Casing Diameter: 2" Well Materials: PVC sch 40 Surface Completion: Boring Method: Sonic	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIAL METERIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION	
0								
1	0-5	100	1.4	moist		tan, poorly sorted fine-coarse sand w/ some silt		
2				Dry.		No s/o		
3								
4								
5								
6	5-10	100	0.1	Dry		S&A w/ large, rounded cobbles @ 7-8', siltier near 10'		
7								
8								
9								
10								
11	10-15	100	0	Dry		fine-med sand silt & v fine sand		
12								
13								
14						fine-med w/ silt		
15						No s/o		
16	15-20	100	0	Dry		tan v. fine sand w/ silt, No s/o		
17								
18								
19								
20								
21	20-25	50	0	Dry		fine to coarse sand w/ large rounded cobbles (2") tan		
22								
23								
24						No s/o		
25								



 <b>ENSOLUM</b>					Client: <u>HILCORP</u> Project Name: <u>SULLIVAN GC D #1E</u> Project Location: Project Manager: <u>STUART HYDE</u>		<b>BORING LOG NUMBER</b> <u>BH 25</u> Project No.:	
Date Sampled: Drilled By: Driller: Logged By:					Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:		Borehole Diameter: Casing Diameter: Well Materials: Surface Completion: Boring Method:	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIAL METERIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION	
25						v fine-med. sand w/ silt		
26	25-							
27	30	100	0	Dry				
28								
29				moist		low plasticity, brown, silty clay w/ sand		
30								
31	32-					fin, fine to coarse sand w/ cobbles		
32	35	60	3.6	Dry		No s/o		
33								
34								
35								
36	35-					interbedded sand, silt + silty clay, mod odor		
37	40	100	1387	moist GW @ 37.5'		stronger odor + some gray staining 37.5-40		
38								
39								
40								
41			8.0	moist		moist, gray silty fines		
42	40-	100						
43	45			Dry		gray, very dry, consolidated, silty fines		
44								
45			8.7					
46						TD @ 45'		
47						@ 1722		
48						set well @ 42'		
49								
50								


		Client: <u>HILCORP</u>		BORING LOG NUMBER	
		Project Name: <u>SULLIVAN GC D #1E</u>		<u>BH 26</u>	
Date Sampled: <u>4-16-23</u>		Project Location:		Project No.:	
Drilled By: <u>Cascade</u>		Ground Surface Elevation:		Borehole Diameter: <u>6"</u>	
Driller: <u>Jason Moore</u>		Top of Casing Elevation:		Casing Diameter: <u>2"</u>	
Logged By: <u>E. Carroll</u>		North Coordinate:		Well Materials: <u>PVC</u>	
		West Coordinate:		Surface Completion:	
				Boring Method: <u>Soil</u>	


DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIAL METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION
0							
1							
2	0-5	100	0.8		SP	lt. red brown moist sand, few silt no stain no odor	
3							
4							
5							
6							
7	5-10	100	0.3		SP	SAA	
8							
9							
10							
11							
12	10-15	100	0.9		SP	SAA	
13							
14							
15							
16							
17	15-20	100	0.9		SP	moist lt red brown sand some silt	
18							
19							
20							
21							
22	20-25	100	1.8		SP	SAA	
23							
24							
25							





						Client: <u>HILCORP</u> Project Name: <u>SULLIVAN GC D #1E</u> Project Location: Project Manager: <u>STUART HYDE</u>		BORING LOG NUMBER <u>BH20</u> Project No.:	
Date Sampled: <u>4-16-23</u> Drilled By: <u>cascade</u> Driller: <u>Jason Moore</u> Logged By: <u>E. Carroll</u>						Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:		Borehole Diameter: <u>6"</u> Casing Diameter: <u>2"</u> Well Materials: <u>PVC</u> Surface Completion: <u>stick up</u> Boring Method: <u>SONIC</u>	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIAL METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION		
25	25-30	100	1.4		SP	moist dark brown sand some silt, little clay No stain/odor			
26									
27									
28									
29	30-35	100	1.9		CL	Dry gray clayey sand No stain/odor Sample 11:15			
30									
31									
32									
33	35-40	100	0.8		GP	wet gravel some sand			
34									
35									
36									
37	40-42.5	100	0.4		CL	moist gray clay, few sand Sample 11:30 TD = 42'			
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									

					Client: <u>HILCORP</u> Project Name: <u>SULLIVAN GC D #1E</u> Project Location: Project Manager: <u>STUART HYDE</u>		BORING LOG NUMBER <u>BH27</u>	
					Date Sampled: Drilled By: Driller: Logged By:		Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIO- METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION	
0								
1								
2	0-5	100	0.6		SP	moist lb. red brown sand, some silt NO S/O		
3								
4								
5								
6								
7	5-10	100	0.4		SP	Dry lb red brown sand some silt/gravel NO S/O		
8								
9								
10								
11								
12	10-15	100	0.3		SP	Dry lb. brown coarse sand some gravel		
13								
14								
15								
16								
17	15-20	100	0.2		SP	Dry lb brown fine sand some silt/clay		
18								
19								
20								
21								
22	20-25	100	0.2		SP	moist red brown sand, few silt		
23								
24					SP	Dry white coarse sand		
25								



					Client: HILCORP		BORING LOG NUMBER	
					Project Name: SULLIVAN GC D #1E		B427	
Date Sampled:					Ground Surface Elevation:		Borehole Diameter:	
Drilled By:					Top of Casing Elevation:		Casing Diameter:	
Driller:					North Coordinate:		Well Materials:	
Logged By:					West Coordinate:		Surface Completion:	
							Boring Method:	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIAL-METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION		BORING/WELL COMPLETION
25								
26	25-				SC	Dark brown clayey sand		
27	30	100	0.2					
28								
29								
30								
31	30-		0.8		SP	wet dark brown coarse sand & gravel		
32	35	100						
33								
34						NOB/C		
35								
36	35-		0.8		SP	SAA		
37	40	100						
38								
39			0.3		CL	moist blue gray clay		
40						little sand		
41								
42								
43						TD = 40'		
44								
45								
46								
47								
48								
49								
50								

						Client: <u>HILCORP</u> Project Name: <u>SULLIVAN GC D #1E</u> Project Location: Project Manager: <u>STUART HYDE</u>		BORING LOG NUMBER <u>BH 24</u> Project No.:	
Date Sampled: Drilled By: Driller: Logged By:						Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:		Borehole Diameter: Casing Diameter: Well Materials: Surface Completion: Boring Method:	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/PID READING (PPM)	POTENTIO- METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION		
0						moist lt red brown sand some silb			
1					SP				
2	0-5	100	0.7		SP				
3									
4									
5						Dry lt gray brown coarse			
6					SP	sand			
7									
8	5-10	100	0.2		SP	Dry lt brown sand some silb			
9									
10									
11						Dry coarse sand slight gray stain			
12	10-15	100	1.6		SP				
13									
14					SP	Dry silty sand			
15									
16						Dry sand and gravel slight stain (gray)			
17	15-20	100	0.7		SP				
18									
19									
20									
21	20-25	100	1.9		SP	moist, coarse, lt. brown sand			
22									
23									
24									
25									

					Client: <u>HILCORP</u> Project Name: <u>SULLIVAN GC'D #1E</u> Project Location: Project Manager: <u>STUART HYDE</u>		BORING LOG NUMBER <u>BH29</u> Project No.:	
Date Sampled: Drilled By: Driller: Logged By:					Ground Surface Elevation: Top of Casing Elevation: North Coordinate: West Coordinate:		Borehole Diameter: Casing Diameter: Well Materials: Surface Completion: Boring Method:	
DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY (%)	FID/FID READING (PPM)	POTENTIAL METRIC SURFACE	GEOLOGIC LOG SYMBOL	GEOLOGIC DESCRIPTION	BORING/WELL COMPLETION	
0.5								
1								
2								
3	25-30	100	0.8		SP	moist <del>co</del> medium, lt brown sand, little silt		
4								
5								
6	30-35				SP	Dry coarse lt brown sand		
7								
8								
9								
10								
11								
12	35-40	100	0.6		SP	very moist, dark brown fine sand some silt		
13								
14								
15								
16								
17	40-45	100	0.2		CL	moist bluegray sandy clay		
18								
19								
20								
21								
22								
23								
24								
25								

Well fell in to 39'



## APPENDIX C

# Groundwater Laboratory Analytical Reports

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Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

April 07, 2021

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

RE: Sullivan GC D #1E

OrderNo.: 2103D87

Dear Clara Cardoza:

Hall Environmental Analysis Laboratory received 8 sample(s) on 3/31/2021 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109



## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW03

Project: Sullivan GC D #1E

Collection Date: 3/29/2021 12:12:00 PM

Lab ID: 2103D87-001

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: JMR
Benzene	ND	1.0		µg/L	1	4/2/2021 1:35:51 AM	A76399
Toluene	ND	1.0		µg/L	1	4/2/2021 1:35:51 AM	A76399
Ethylbenzene	ND	1.0		µg/L	1	4/2/2021 1:35:51 AM	A76399
Xylenes, Total	ND	1.5		µg/L	1	4/2/2021 1:35:51 AM	A76399
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	4/2/2021 1:35:51 AM	A76399
Surr: Dibromofluoromethane	106	70-130		%Rec	1	4/2/2021 1:35:51 AM	A76399
Surr: Toluene-d8	101	70-130		%Rec	1	4/2/2021 1:35:51 AM	A76399

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

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

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## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW05

Project: Sullivan GC D #1E

Collection Date: 3/30/2021 11:15:00 AM

Lab ID: 2103D87-002

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: JMR
Benzene	220	10		µg/L	10	4/2/2021 2:04:32 AM	A76399
Toluene	970	100		µg/L	100	4/2/2021 2:58:15 PM	R76442
Ethylbenzene	190	10		µg/L	10	4/2/2021 2:04:32 AM	A76399
Xylenes, Total	6200	150		µg/L	100	4/2/2021 2:58:15 PM	R76442
Surr: 1,2-Dichloroethane-d4	118	70-130		%Rec	10	4/2/2021 2:04:32 AM	A76399
Surr: Dibromofluoromethane	102	70-130		%Rec	10	4/2/2021 2:04:32 AM	A76399
Surr: Toluene-d8	102	70-130		%Rec	10	4/2/2021 2:04:32 AM	A76399

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

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

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## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW06

Project: Sullivan GC D #1E

Collection Date: 3/29/2021 1:55:00 PM

Lab ID: 2103D87-003

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: JMR
Benzene	21	5.0	P	µg/L	5	4/2/2021 3:26:50 PM	R76442
Toluene	310	5.0	P	µg/L	5	4/2/2021 3:26:50 PM	R76442
Ethylbenzene	340	5.0	P	µg/L	5	4/2/2021 3:26:50 PM	R76442
Xylenes, Total	2500	75	P	µg/L	50	4/2/2021 3:30:12 AM	A76399
Surr: 1,2-Dichloroethane-d4	98.9	70-130	P	%Rec	5	4/2/2021 3:26:50 PM	R76442
Surr: Dibromofluoromethane	101	70-130	P	%Rec	5	4/2/2021 3:26:50 PM	R76442
Surr: Toluene-d8	101	70-130	P	%Rec	5	4/2/2021 3:26:50 PM	R76442

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

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

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## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW07

Project: Sullivan GC D #1E

Collection Date: 3/29/2021 1:10:00 PM

Lab ID: 2103D87-004

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	1.0		µg/L	1	4/2/2021 3:58:50 AM	B76399
Toluene	ND	1.0		µg/L	1	4/2/2021 3:58:50 AM	B76399
Ethylbenzene	ND	1.0		µg/L	1	4/2/2021 3:58:50 AM	B76399
Xylenes, Total	ND	1.5		µg/L	1	4/2/2021 3:58:50 AM	B76399
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	4/2/2021 3:58:50 AM	B76399
Surr: Dibromofluoromethane	106	70-130		%Rec	1	4/2/2021 3:58:50 AM	B76399
Surr: Toluene-d8	103	70-130		%Rec	1	4/2/2021 3:58:50 AM	B76399

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

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

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## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW09

Project: Sullivan GC D #1E

Collection Date: 3/29/2021 12:30:00 PM

Lab ID: 2103D87-005

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: JMR
Benzene	ND	1.0		µg/L	1	4/2/2021 5:24:40 AM	B76399
Toluene	ND	1.0		µg/L	1	4/2/2021 5:24:40 AM	B76399
Ethylbenzene	ND	1.0		µg/L	1	4/2/2021 5:24:40 AM	B76399
Xylenes, Total	ND	1.5		µg/L	1	4/2/2021 5:24:40 AM	B76399
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	4/2/2021 5:24:40 AM	B76399
Surr: Dibromofluoromethane	108	70-130		%Rec	1	4/2/2021 5:24:40 AM	B76399
Surr: Toluene-d8	100	70-130		%Rec	1	4/2/2021 5:24:40 AM	B76399

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

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

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## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW10

Project: Sullivan GC D #1E

Collection Date: 3/29/2021 12:45:00 PM

Lab ID: 2103D87-006

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: JMR
Benzene	ND	1.0		µg/L	1	4/2/2021 5:53:14 AM	B76399
Toluene	ND	1.0		µg/L	1	4/2/2021 5:53:14 AM	B76399
Ethylbenzene	ND	1.0		µg/L	1	4/2/2021 5:53:14 AM	B76399
Xylenes, Total	ND	1.5		µg/L	1	4/2/2021 5:53:14 AM	B76399
Surr: 1,2-Dichloroethane-d4	97.7	70-130		%Rec	1	4/2/2021 5:53:14 AM	B76399
Surr: Dibromofluoromethane	106	70-130		%Rec	1	4/2/2021 5:53:14 AM	B76399
Surr: Toluene-d8	97.5	70-130		%Rec	1	4/2/2021 5:53:14 AM	B76399

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

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

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## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW11

Project: Sullivan GC D #1E

Collection Date: 3/29/2021 12:00:00 PM

Lab ID: 2103D87-007

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: JMR
Benzene	ND	1.0		µg/L	1	4/2/2021 6:21:53 AM	B76399
Toluene	ND	1.0		µg/L	1	4/2/2021 6:21:53 AM	B76399
Ethylbenzene	ND	1.0		µg/L	1	4/2/2021 6:21:53 AM	B76399
Xylenes, Total	ND	1.5		µg/L	1	4/2/2021 6:21:53 AM	B76399
Surr: 1,2-Dichloroethane-d4	89.8	70-130		%Rec	1	4/2/2021 6:21:53 AM	B76399
Surr: Dibromofluoromethane	107	70-130		%Rec	1	4/2/2021 6:21:53 AM	B76399
Surr: Toluene-d8	102	70-130		%Rec	1	4/2/2021 6:21:53 AM	B76399

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

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

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## Analytical Report

Lab Order 2103D87

Date Reported: 4/7/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: PR-1

Project: Sullivan GC D #1E

Collection Date: 3/29/2021 1:34:00 PM

Lab ID: 2103D87-008

Matrix: AQUEOUS

Received Date: 3/31/2021 8:54:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: JMR
Benzene	13	5.0	P	µg/L	5	4/2/2021 4:24:01 PM	R76442
Toluene	94	5.0	P	µg/L	5	4/2/2021 4:24:01 PM	R76442
Ethylbenzene	67	5.0	P	µg/L	5	4/2/2021 4:24:01 PM	R76442
Xylenes, Total	4800	75	P	µg/L	50	4/2/2021 6:50:28 AM	B76399
Surr: 1,2-Dichloroethane-d4	108	70-130	P	%Rec	5	4/2/2021 4:24:01 PM	R76442
Surr: Dibromofluoromethane	108	70-130	P	%Rec	5	4/2/2021 4:24:01 PM	R76442
Surr: Toluene-d8	98.9	70-130	P	%Rec	5	4/2/2021 4:24:01 PM	R76442

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

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

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

WO#: 2103D87

07-Apr-21

**Client:** Hilcorp Energy  
**Project:** Sullivan GC D #1E

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>A76399</b>			RunNo: <b>76399</b>						
Prep Date:	Analysis Date: <b>4/1/2021</b>			SeqNo: <b>2705626</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	106	70	130			
Toluene	21	1.0	20.00	0	103	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	9.1		10.00		91.4	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.7	70	130			
Surr: Toluene-d8	11		10.00		110	70	130			

Sample ID: <b>100ng lcs2</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>B76399</b>			RunNo: <b>76399</b>						
Prep Date:	Analysis Date: <b>4/2/2021</b>			SeqNo: <b>2705627</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.2	70	130			
Toluene	19	1.0	20.00	0	94.7	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.3	70	130			
Surr: 4-Bromofluorobenzene	9.2		10.00		91.9	70	130			
Surr: Dibromofluoromethane	9.6		10.00		95.5	70	130			
Surr: Toluene-d8	9.7		10.00		97.3	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>PBW</b>	Batch ID: <b>A76399</b>			RunNo: <b>76399</b>						
Prep Date:	Analysis Date: <b>4/1/2021</b>			SeqNo: <b>2705628</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		97.7	70	130			
Surr: 4-Bromofluorobenzene	9.5		10.00		95.3	70	130			
Surr: Dibromofluoromethane	11		10.00		112	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID: <b>mb2</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>PBW</b>	Batch ID: <b>B76399</b>			RunNo: <b>76399</b>						
Prep Date:	Analysis Date: <b>4/2/2021</b>			SeqNo: <b>2705629</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2103D87

07-Apr-21

**Client:** Hilcorp Energy  
**Project:** Sullivan GC D #1E

Sample ID: <b>mb2</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>PBW</b>	Batch ID: <b>B76399</b>	RunNo: <b>76399</b>								
Prep Date:	Analysis Date: <b>4/2/2021</b>	SeqNo: <b>2705629</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	8.7		10.00		87.3	70	130			
Surr: Dibromofluoromethane	11		10.00		107	70	130			
Surr: Toluene-d8	9.8		10.00		98.3	70	130			

Sample ID: <b>2103d87-004ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>MW07</b>	Batch ID: <b>B76399</b>	RunNo: <b>76399</b>								
Prep Date:	Analysis Date: <b>4/2/2021</b>	SeqNo: <b>2705647</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	102	70	130			
Toluene	19	1.0	20.00	0	96.1	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.3	70	130			
Surr: 4-Bromofluorobenzene	9.1		10.00		90.7	70	130			
Surr: Dibromofluoromethane	9.4		10.00		94.0	70	130			
Surr: Toluene-d8	9.7		10.00		97.3	70	130			

Sample ID: <b>2103d87-004amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>MW07</b>	Batch ID: <b>B76399</b>	RunNo: <b>76399</b>								
Prep Date:	Analysis Date: <b>4/2/2021</b>	SeqNo: <b>2705648</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	97.1	70	130	4.45	20	
Toluene	18	1.0	20.00	0	88.6	70	130	8.18	20	
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.3		10.00		93.1	70	130	0	0	
Surr: Dibromofluoromethane	9.5		10.00		95.3	70	130	0	0	
Surr: Toluene-d8	9.5		10.00		95.3	70	130	0	0	

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>LCSW</b>	Batch ID: <b>R76442</b>	RunNo: <b>76442</b>								
Prep Date:	Analysis Date: <b>4/2/2021</b>	SeqNo: <b>2707668</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	98.7	70	130			
Toluene	19	1.0	20.00	0	92.8	70	130			
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.3	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.8	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit



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

WO#: 2103D87

07-Apr-21

**Client:** Hilcorp Energy  
**Project:** Sullivan GC D #1E

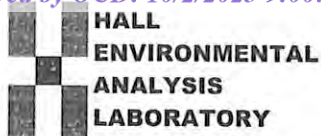
Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>R76442</b>		RunNo: <b>76442</b>							
Prep Date:	Analysis Date: <b>4/2/2021</b>		SeqNo: <b>2707668</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.8		10.00		98.0	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>PBW</b>	Batch ID: <b>R76442</b>		RunNo: <b>76442</b>							
Prep Date:	Analysis Date: <b>4/2/2021</b>		SeqNo: <b>2707669</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.2	70	130			
Surr: 4-Bromofluorobenzene	8.9		10.00		88.5	70	130			
Surr: Dibromofluoromethane	11		10.00		107	70	130			
Surr: Toluene-d8	10		10.00		99.8	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit



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

## Sample Log-In Check List

Client Name: Hilcorp Energy

Work Order Number: 2103D87

RcptNo: 1

Received By: Cheyenne Cason 3/31/2021 8:54:00 AM

Completed By: Cheyenne Cason 3/31/2021 9:29:22 AM

Reviewed By: DAD 3/31/21

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4''$  for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

(&lt;2 or &gt;12 unless noted)

Adjusted?

Checked by: SPA 3.31.21

Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.8	Good				





Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

June 23, 2021

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

RE: Sullivan GC D 1E

OrderNo.: 2106658

Dear Mitch Killough:

Hall Environmental Analysis Laboratory received 6 sample(s) on 6/11/2021 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109



## Analytical Report

Lab Order: 2106658

Date Reported: 6/23/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2106658

Project: Sullivan GC D 1E

Lab ID: 2106658-001

Collection Date: 6/10/2021 1:00:00 PM

Client Sample ID: MW 06

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: RAA
Benzene	54	50	P	µg/L	50	6/18/2021 9:19:49 PM	SL7922
Toluene	340	50	P	µg/L	50	6/18/2021 9:19:49 PM	SL7922
Ethylbenzene	480	50	P	µg/L	50	6/18/2021 9:19:49 PM	SL7922
Xylenes, Total	5500	75	P	µg/L	50	6/18/2021 9:19:49 PM	SL7922
Surr: 1,2-Dichloroethane-d4	120	70-130	P	%Rec	50	6/18/2021 9:19:49 PM	SL7922
Surr: Dibromofluoromethane	108	70-130	P	%Rec	50	6/18/2021 9:19:49 PM	SL7922
Surr: Toluene-d8	107	70-130	P	%Rec	50	6/18/2021 9:19:49 PM	SL7922

Lab ID: 2106658-002

Collection Date: 6/10/2021 12:40:00 PM

Client Sample ID: MW 07

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: RAA
Benzene	ND	1.0		µg/L	1	6/18/2021 9:47:13 PM	SL7922
Toluene	ND	1.0		µg/L	1	6/18/2021 9:47:13 PM	SL7922
Ethylbenzene	ND	1.0		µg/L	1	6/18/2021 9:47:13 PM	SL7922
Xylenes, Total	ND	1.5		µg/L	1	6/18/2021 9:47:13 PM	SL7922
Surr: 1,2-Dichloroethane-d4	119	70-130		%Rec	1	6/18/2021 9:47:13 PM	SL7922
Surr: Dibromofluoromethane	108	70-130		%Rec	1	6/18/2021 9:47:13 PM	SL7922
Surr: Toluene-d8	107	70-130		%Rec	1	6/18/2021 9:47:13 PM	SL7922

Lab ID: 2106658-003

Collection Date: 6/10/2021 12:00:00 PM

Client Sample ID: MW 09

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: RAA
Benzene	ND	1.0		µg/L	1	6/18/2021 10:14:27 PM	SL7922
Toluene	ND	1.0		µg/L	1	6/18/2021 10:14:27 PM	SL7922
Ethylbenzene	ND	1.0		µg/L	1	6/18/2021 10:14:27 PM	SL7922
Xylenes, Total	ND	1.5		µg/L	1	6/18/2021 10:14:27 PM	SL7922
Surr: 1,2-Dichloroethane-d4	110	70-130		%Rec	1	6/18/2021 10:14:27 PM	SL7922
Surr: Dibromofluoromethane	104	70-130		%Rec	1	6/18/2021 10:14:27 PM	SL7922
Surr: Toluene-d8	102	70-130		%Rec	1	6/18/2021 10:14:27 PM	SL7922

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

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



## Analytical Report

Lab Order: 2106658

Date Reported: 6/23/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2106658

Project: Sullivan GC D 1E

Lab ID: 2106658-004

Collection Date: 6/10/2021 12:20:00 PM

Client Sample ID: MW 10

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: RAA
Benzene	ND	1.0		µg/L	1	6/19/2021 1:25:20 AM	SL7922
Toluene	ND	1.0		µg/L	1	6/19/2021 1:25:20 AM	SL7922
Ethylbenzene	ND	1.0		µg/L	1	6/19/2021 1:25:20 AM	SL7922
Xylenes, Total	ND	1.5		µg/L	1	6/19/2021 1:25:20 AM	SL7922
Surr: 1,2-Dichloroethane-d4	110	70-130		%Rec	1	6/19/2021 1:25:20 AM	SL7922
Surr: Dibromofluoromethane	103	70-130		%Rec	1	6/19/2021 1:25:20 AM	SL7922
Surr: Toluene-d8	99.9	70-130		%Rec	1	6/19/2021 1:25:20 AM	SL7922

Lab ID: 2106658-005

Collection Date: 6/10/2021 1:30:00 PM

Client Sample ID: MW 11

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: RAA
Benzene	ND	1.0		µg/L	1	6/19/2021 1:52:36 AM	SL7922
Toluene	ND	1.0		µg/L	1	6/19/2021 1:52:36 AM	SL7922
Ethylbenzene	ND	1.0		µg/L	1	6/19/2021 1:52:36 AM	SL7922
Xylenes, Total	ND	1.5		µg/L	1	6/19/2021 1:52:36 AM	SL7922
Surr: 1,2-Dichloroethane-d4	118	70-130		%Rec	1	6/19/2021 1:52:36 AM	SL7922
Surr: Dibromofluoromethane	106	70-130		%Rec	1	6/19/2021 1:52:36 AM	SL7922
Surr: Toluene-d8	100	70-130		%Rec	1	6/19/2021 1:52:36 AM	SL7922

Lab ID: 2106658-006

Collection Date: 6/10/2021 1:10:00 PM

Client Sample ID: PR-1

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: RAA
Benzene	9.0	5.0	P	µg/L	10	6/21/2021 5:09:07 PM	SL7924
Toluene	35	10	P	µg/L	10	6/21/2021 5:09:07 PM	SL7924
Ethylbenzene	26	10	P	µg/L	10	6/21/2021 5:09:07 PM	SL7924
Xylenes, Total	1600	15	P	µg/L	10	6/21/2021 5:09:07 PM	SL7924
Surr: 1,2-Dichloroethane-d4	107	70-130	P	%Rec	10	6/21/2021 5:09:07 PM	SL7924
Surr: Dibromofluoromethane	99.3	70-130	P	%Rec	10	6/21/2021 5:09:07 PM	SL7924
Surr: Toluene-d8	108	70-130	P	%Rec	10	6/21/2021 5:09:07 PM	SL7924

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

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

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

WO#: 2106658

23-Jun-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>SL79222</b>		RunNo: <b>79222</b>							
Prep Date:	Analysis Date: <b>6/18/2021</b>		SeqNo: <b>2781771</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	70	130			
Toluene	21	1.0	20.00	0	105	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		111	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>PBW</b>	Batch ID: <b>SL79222</b>		RunNo: <b>79222</b>							
Prep Date:	Analysis Date: <b>6/18/2021</b>		SeqNo: <b>2781779</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		105	70	130			
Surr: Dibromofluoromethane	11		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>SL79245</b>		RunNo: <b>79245</b>							
Prep Date:	Analysis Date: <b>6/21/2021</b>		SeqNo: <b>2782990</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	86.3	70	130			
Toluene	19	1.0	20.00	0	94.4	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.8	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		109	70	130			
Surr: Dibromofluoromethane	9.5		10.00		94.7	70	130			
Surr: Toluene-d8	9.7		10.00		97.4	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>PBW</b>	Batch ID: <b>SL79245</b>		RunNo: <b>79245</b>							
Prep Date:	Analysis Date: <b>6/21/2021</b>		SeqNo: <b>2782999</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

QC SUMMARY REPORT  
Hall Environmental Analysis Laboratory, Inc.

WO#: 2106658  
23-Jun-21

Client: HILCORP ENERGY  
Project: Sullivan GC D 1E

Sample ID: mb		SampType: MBLK		TestCode: EPA Method 8260: Volatiles Short List						
Client ID: PBW		Batch ID: SL79245		RunNo: 79245						
Prep Date:		Analysis Date: 6/21/2021		SeqNo: 2782999		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		111	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Qualifiers:

- \*

Value exceeds Maximum Contaminant Level.
- D

Sample Diluted Due to Matrix
- H

Holding times for preparation or analysis exceeded
- ND

Not Detected at the Reporting Limit
- PQL

Practical Quantitative Limit
- S

% Recovery outside of range due to dilution or matrix
- B

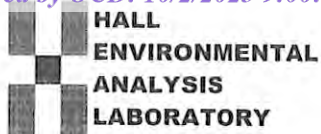
Analyte detected in the associated Method Blank
- E

Value above quantitation range
- J

Analyte detected below quantitation limits
- P

Sample pH Not In Range
- RL

Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2106658

RcptNo: 1

Received By: Juan Rojas

6/11/2021 7:30:00 AM

*Juan Rojas*

Completed By: Desiree Dominguez

6/11/2021 8:43:48 AM

*DD*Reviewed By: *SGC 6/11/21*Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4"$  for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted?

Checked by: *KRC 6/11/21*

Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.7	Good	Yes			
2	0.4	Good	Yes			









Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

October 12, 2021

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

RE: Sullivan GC D 1E

OrderNo.: 2109F63

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 8 sample(s) on 9/28/2021 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

## Analytical Report

Lab Order: 2109F63

Date Reported: 10/12/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2109F63

Project: Sullivan GC D 1E

Lab ID: 2109F63-001

Collection Date: 9/23/2021 10:56:00 AM

Client Sample ID: MW-09

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	ND	1.0		µg/L	1	9/30/2021 7:16:00 PM	R81727
Toluene	ND	1.0		µg/L	1	9/30/2021 7:16:00 PM	R81727
Ethylbenzene	ND	1.0		µg/L	1	9/30/2021 7:16:00 PM	R81727
Xylenes, Total	ND	2.0		µg/L	1	9/30/2021 7:16:00 PM	R81727
Surr: 4-Bromofluorobenzene	89.6	70-130		%Rec	1	9/30/2021 7:16:00 PM	R81727

Lab ID: 2109F63-002

Collection Date: 9/23/2021 1:30:00 PM

Client Sample ID: MW-10

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	ND	1.0	P	µg/L	1	9/30/2021 7:35:00 PM	R81727
Toluene	ND	1.0	P	µg/L	1	9/30/2021 7:35:00 PM	R81727
Ethylbenzene	ND	1.0	P	µg/L	1	9/30/2021 7:35:00 PM	R81727
Xylenes, Total	ND	2.0	P	µg/L	1	9/30/2021 7:35:00 PM	R81727
Surr: 4-Bromofluorobenzene	82.2	70-130	P	%Rec	1	9/30/2021 7:35:00 PM	R81727

Lab ID: 2109F63-003

Collection Date: 9/23/2021 2:15:00 PM

Client Sample ID: MW-11

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	ND	1.0		µg/L	1	9/30/2021 7:55:00 PM	R81727
Toluene	ND	1.0		µg/L	1	9/30/2021 7:55:00 PM	R81727
Ethylbenzene	ND	1.0		µg/L	1	9/30/2021 7:55:00 PM	R81727
Xylenes, Total	ND	2.0		µg/L	1	9/30/2021 7:55:00 PM	R81727
Surr: 4-Bromofluorobenzene	81.7	70-130		%Rec	1	9/30/2021 7:55:00 PM	R81727

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

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

## Analytical Report

Lab Order: 2109F63

Date Reported: 10/12/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2109F63

Project: Sullivan GC D 1E

Lab ID: 2109F63-004

Collection Date: 9/23/2021 2:30:00 PM

Client Sample ID: MW-07

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	ND	1.0	P	µg/L	1	9/30/2021 8:14:00 PM	R81727
Toluene	ND	1.0	P	µg/L	1	9/30/2021 8:14:00 PM	R81727
Ethylbenzene	ND	1.0	P	µg/L	1	9/30/2021 8:14:00 PM	R81727
Xylenes, Total	ND	2.0	P	µg/L	1	9/30/2021 8:14:00 PM	R81727
Surr: 4-Bromofluorobenzene	80.4	70-130	P	%Rec	1	9/30/2021 8:14:00 PM	R81727

Lab ID: 2109F63-005

Collection Date: 9/23/2021 3:00:00 PM

Client Sample ID: MW-16

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	ND	1.0	P	µg/L	1	9/30/2021 8:34:00 PM	R81727
Toluene	ND	1.0	P	µg/L	1	9/30/2021 8:34:00 PM	R81727
Ethylbenzene	ND	1.0	P	µg/L	1	9/30/2021 8:34:00 PM	R81727
Xylenes, Total	ND	2.0	P	µg/L	1	9/30/2021 8:34:00 PM	R81727
Surr: 4-Bromofluorobenzene	83.7	70-130	P	%Rec	1	9/30/2021 8:34:00 PM	R81727

Lab ID: 2109F63-006

Collection Date: 9/23/2021 3:30:00 PM

Client Sample ID: MW-17

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	ND	1.0		µg/L	1	9/30/2021 8:53:00 PM	R81727
Toluene	ND	1.0		µg/L	1	9/30/2021 8:53:00 PM	R81727
Ethylbenzene	ND	1.0		µg/L	1	9/30/2021 8:53:00 PM	R81727
Xylenes, Total	ND	2.0		µg/L	1	9/30/2021 8:53:00 PM	R81727
Surr: 4-Bromofluorobenzene	85.4	70-130		%Rec	1	9/30/2021 8:53:00 PM	R81727

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

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

## Analytical Report

Lab Order: 2109F63

Date Reported: 10/12/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2109F63

Project: Sullivan GC D 1E

Lab ID: 2109F63-007

Collection Date: 9/24/2021 3:20:00 PM

Client Sample ID: MW-15

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	5.2	5.0	P	µg/L	5	9/30/2021 9:13:00 PM	R81727
Toluene	ND	5.0	P	µg/L	5	9/30/2021 9:13:00 PM	R81727
Ethylbenzene	120	5.0	P	µg/L	5	9/30/2021 9:13:00 PM	R81727
Xylenes, Total	1100	100		µg/L	50	10/2/2021 3:40:00 PM	R81749
Surr: 4-Bromofluorobenzene	123	70-130	P	%Rec	5	9/30/2021 9:13:00 PM	R81727

Lab ID: 2109F63-008

Collection Date: 9/24/2021 3:50:00 PM

Client Sample ID: MW-13

Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: CCM
Benzene	23	5.0	P	µg/L	5	9/30/2021 9:33:00 PM	R81727
Toluene	ND	5.0	P	µg/L	5	9/30/2021 9:33:00 PM	R81727
Ethylbenzene	54	5.0	P	µg/L	5	9/30/2021 9:33:00 PM	R81727
Xylenes, Total	750	10	P	µg/L	5	9/30/2021 9:33:00 PM	R81727
Surr: 4-Bromofluorobenzene	101	70-130	P	%Rec	5	9/30/2021 9:33:00 PM	R81727

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

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

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

WO#: 2109F63

12-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>				TestCode: <b>EPA Method 8021B: Volatiles</b>					
Client ID: <b>LCSW</b>	Batch ID: <b>R81727</b>				RunNo: <b>81727</b>					
Prep Date:	Analysis Date: <b>9/30/2021</b>				SeqNo: <b>2889432</b>	Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	102	80	120			
Toluene	21	1.0	20.00	0	104	80	120			
Ethylbenzene	21	1.0	20.00	0	107	80	120			
Xylenes, Total	65	2.0	60.00	0	108	80	120			
Surr: 4-Bromofluorobenzene	18		20.00		89.0	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>				TestCode: <b>EPA Method 8021B: Volatiles</b>					
Client ID: <b>PBW</b>	Batch ID: <b>R81727</b>				RunNo: <b>81727</b>					
Prep Date:	Analysis Date: <b>9/30/2021</b>				SeqNo: <b>2889433</b>	Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	18		20.00		87.8	70	130			

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>				TestCode: <b>EPA Method 8021B: Volatiles</b>					
Client ID: <b>LCSW</b>	Batch ID: <b>R81749</b>				RunNo: <b>81749</b>					
Prep Date:	Analysis Date: <b>10/2/2021</b>				SeqNo: <b>2890788</b>	Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	63	2.0	60.00	0	104	80	120			
Surr: 4-Bromofluorobenzene	17		20.00		87.1	70	130			

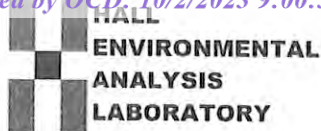
Sample ID: <b>mb</b>	SampType: <b>MBLK</b>				TestCode: <b>EPA Method 8021B: Volatiles</b>					
Client ID: <b>PBW</b>	Batch ID: <b>R81749</b>				RunNo: <b>81749</b>					
Prep Date:	Analysis Date: <b>10/2/2021</b>				SeqNo: <b>2890789</b>	Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	17		20.00		85.3	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit





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

## Sample Log-In Check List

Client Name: Hilcorp Energy

Work Order Number: 2109F63

RcptNo: 1

Received By: Cheyenne Cason

9/28/2021 7:00:00 AM

Completed By: Isaiah Ortiz

9/28/2021 8:09:12 AM

Reviewed By:

JN 9/29/21

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4$ " for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

(<2 or >12 unless noted)

Adjusted? \_\_\_\_\_

Checked by: CAC 9/29/21

Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.0	Good	Not Present			
2	3.3	Good	Not Present			

## Chain-of-Custody Record

Client: Hilcorp

Att: Kate Kauderman

Mailing Address: 1111 Travis St  
Houston TX

Phone #: 713-575-5247

email or Fax#: K.Kauderman@hilcorp.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Sullivan GC D#1EProject #: TE017821005

Project Manager:

Josh Adams

Sampler:

On Ice: ☒ Yes ☐ No# of Coolers: 2 20.0=2.0Cooler Temp (including CF): 3.3 - 0 = 3.3 (°C)

Container Type and #

Preservative Type

HEAL No.

2109F63001002003004005006007008001002003004005





Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

December 29, 2021

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

RE: Sullivan GC D 1E

OrderNo.: 2112B67

Dear Josh Adams:

Hall Environmental Analysis Laboratory received 7 sample(s) on 12/18/2021 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

## Analytical Report

Lab Order 2112B67

Date Reported: 12/29/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-21

Project: Sullivan GC D 1E

Collection Date: 12/14/2021 2:30:00 PM

Lab ID: 2112B67-001

Matrix: GROUNDWA

Received Date: 12/18/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: NSB
Benzene	ND	1.0	P	µg/L	1	12/23/2021 10:02:58 PM
Toluene	ND	1.0	P	µg/L	1	12/23/2021 10:02:58 PM
Ethylbenzene	ND	1.0	P	µg/L	1	12/23/2021 10:02:58 PM
Xylenes, Total	ND	2.0	P	µg/L	1	12/23/2021 10:02:58 PM
Surr: 4-Bromofluorobenzene	106	70-130	P	%Rec	1	12/23/2021 10:02:58 PM

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

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

Page 1 of 9

## Analytical Report

Lab Order **2112B67**

Date Reported: 12/29/2021

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT: HILCORP ENERGY**

**Client Sample ID:** MW-07

**Project:** Sullivan GC D 1E

**Collection Date:** 12/14/2021 1:10:00 PM

**Lab ID:** 2112B67-002

**Matrix:** GROUNDWA

Received Date: 12/18/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	1.0		µg/L	1	12/23/2021 10:26:25 PM
Toluene	ND	1.0		µg/L	1	12/23/2021 10:26:25 PM
Ethylbenzene	ND	1.0		µg/L	1	12/23/2021 10:26:25 PM
Xylenes, Total	ND	2.0		µg/L	1	12/23/2021 10:26:25 PM
Surr: 4-Bromofluorobenzene	98.5	70-130		%Rec	1	12/23/2021 10:26:25 PM

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

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

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## Analytical Report

Lab Order 2112B67

Date Reported: 12/29/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-17

Project: Sullivan GC D 1E

Collection Date: 12/14/2021 1:35:00 PM

Lab ID: 2112B67-003

Matrix: GROUNDWA

Received Date: 12/18/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.0		µg/L	1	12/23/2021 10:49:55 PM
Toluene	ND	1.0		µg/L	1	12/23/2021 10:49:55 PM
Ethylbenzene	ND	1.0		µg/L	1	12/23/2021 10:49:55 PM
Xylenes, Total	ND	2.0		µg/L	1	12/23/2021 10:49:55 PM
Surr: 4-Bromofluorobenzene	98.4	70-130		%Rec	1	12/23/2021 10:49:55 PM

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

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

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## Analytical Report

Lab Order **2112B67**

Date Reported: 12/29/2021

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT: HILCORP ENERGY**

**Client Sample ID:** MW-10

**Project:** Sullivan GC D 1E

**Collection Date:** 12/14/2021 11:40:00 AM

**Lab ID:** 2112B67-004

**Matrix:** GROUNDWA

**Received Date:** 12/18/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>NSB</b>
Benzene	ND	1.0		µg/L	1	12/23/2021 11:13:28 PM
Toluene	ND	1.0		µg/L	1	12/23/2021 11:13:28 PM
Ethylbenzene	ND	1.0		µg/L	1	12/23/2021 11:13:28 PM
Xylenes, Total	ND	2.0		µg/L	1	12/23/2021 11:13:28 PM
Surr: 4-Bromofluorobenzene	99.0	70-130		%Rec	1	12/23/2021 11:13:28 PM

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

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

Page 4 of 9

## Analytical Report

Lab Order 2112B67

Date Reported: 12/29/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-09

Project: Sullivan GC D 1E

Collection Date: 12/14/2021 11:20:00 AM

Lab ID: 2112B67-005

Matrix: GROUNDWA

Received Date: 12/18/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: NSB
Benzene	ND	1.0		µg/L	1	12/23/2021 11:37:02 PM
Toluene	ND	1.0		µg/L	1	12/23/2021 11:37:02 PM
Ethylbenzene	ND	1.0		µg/L	1	12/23/2021 11:37:02 PM
Xylenes, Total	ND	2.0		µg/L	1	12/23/2021 11:37:02 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	12/23/2021 11:37:02 PM

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

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

Page 5 of 9

## Analytical Report

Lab Order 2112B67

Date Reported: 12/29/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-11

Project: Sullivan GC D 1E

Collection Date: 12/14/2021 12:10:00 PM

Lab ID: 2112B67-006

Matrix: GROUNDWA

Received Date: 12/18/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: NSB
Benzene	ND	1.0		µg/L	1	12/24/2021 12:47:36 AM
Toluene	ND	1.0		µg/L	1	12/24/2021 12:47:36 AM
Ethylbenzene	ND	1.0		µg/L	1	12/24/2021 12:47:36 AM
Xylenes, Total	ND	2.0		µg/L	1	12/24/2021 12:47:36 AM
Surr: 4-Bromofluorobenzene	99.3	70-130		%Rec	1	12/24/2021 12:47:36 AM

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

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

Page 6 of 9

## Analytical Report

Lab Order 2112B67

Date Reported: 12/29/2021

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: PR-2

Project: Sullivan GC D 1E

Collection Date: 12/14/2021 12:45:00 PM

Lab ID: 2112B67-007

Matrix: GROUNDWA

Received Date: 12/18/2021 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	7.5	5.0		µg/L	5	12/24/2021 2:21:40 AM
Toluene	28	5.0		µg/L	5	12/24/2021 2:21:40 AM
Ethylbenzene	57	5.0		µg/L	5	12/24/2021 2:21:40 AM
Xylenes, Total	830	10		µg/L	5	12/24/2021 2:21:40 AM
Surr: 4-Bromofluorobenzene	123	70-130		%Rec	5	12/24/2021 2:21:40 AM

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

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

Page 7 of 9



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

WO#: 2112B67

29-Dec-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R84776</b>			RunNo: <b>84776</b>						
Prep Date:	Analysis Date: <b>12/23/2021</b>			SeqNo: <b>2981538</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	80	120			
Toluene	20	1.0	20.00	0	101	80	120			
Ethylbenzene	20	1.0	20.00	0	99.7	80	120			
Xylenes, Total	59	2.0	60.00	0	98.9	80	120			
Surr: 4-Bromofluorobenzene	20		20.00		102	70	130			

Sample ID: <b>100ng btex lcs-II</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R84776</b>			RunNo: <b>84776</b>						
Prep Date:	Analysis Date: <b>12/24/2021</b>			SeqNo: <b>2981539</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.3	80	120			
Toluene	20	1.0	20.00	0	98.3	80	120			
Ethylbenzene	20	1.0	20.00	0	97.5	80	120			
Xylenes, Total	58	2.0	60.00	0	97.1	80	120			
Surr: 4-Bromofluorobenzene	20		20.00		101	70	130			

Sample ID: <b>2112b67-005ams</b>	SampType: <b>MS</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>MW-09</b>	Batch ID: <b>R84776</b>			RunNo: <b>84776</b>						
Prep Date:	Analysis Date: <b>12/24/2021</b>			SeqNo: <b>2981555</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	98.7	80	120			
Toluene	20	1.0	20.00	0	98.8	80	120			
Ethylbenzene	20	1.0	20.00	0	97.6	80	120			
Xylenes, Total	58	2.0	60.00	0	97.1	80	120			
Surr: 4-Bromofluorobenzene	20		20.00		98.6	70	130			

Sample ID: <b>2112b67-005amsd</b>	SampType: <b>MSD</b>			TestCode: <b>EPA Method 8021B: Volatiles</b>						
Client ID: <b>MW-09</b>	Batch ID: <b>R84776</b>			RunNo: <b>84776</b>						
Prep Date:	Analysis Date: <b>12/24/2021</b>			SeqNo: <b>2981556</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	80	120	1.99	20	
Toluene	20	1.0	20.00	0	99.5	80	120	0.625	20	
Ethylbenzene	20	1.0	20.00	0	98.0	80	120	0.409	20	
Xylenes, Total	59	2.0	60.00	0	97.6	80	120	0.558	20	
Surr: 4-Bromofluorobenzene	20		20.00		100	70	130	0	0	

**Qualifiers:**

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

QC SUMMARY REPORT  
Hall Environmental Analysis Laboratory, Inc.

WO#: 2112B67  
29-Dec-21

Client: HILCORP ENERGY  
Project: Sullivan GC D 1E

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBW	Batch ID: R84776	RunNo: 84776								
Prep Date:	Analysis Date: 12/23/2021	SeqNo: 2981571	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	20		20.00		100	70	130			

Sample ID: mb-II	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBW	Batch ID: R84776	RunNo: 84776								
Prep Date:	Analysis Date: 12/24/2021	SeqNo: 2981572	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	20		20.00		102	70	130			

Qualifiers:

- \*

Value exceeds Maximum Contaminant Level.
- D

Sample Diluted Due to Matrix
- H

Holding times for preparation or analysis exceeded
- ND

Not Detected at the Reporting Limit
- PQL

Practical Quantitative Limit
- S

% Recovery outside of range due to dilution or matrix interference
- B

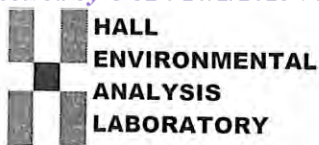
Analyte detected in the associated Method Blank
- E

Value above quantitation range
- J

Analyte detected below quantitation limits
- P

Sample pH Not In Range
- RL

Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2112B67

RcptNo: 1

Received By: Isaiah Ortiz 12/18/2021 10:00:00 AM

Completed By: Desiree Dominguez 12/20/2021 8:23:04 AM

Reviewed By: KPG 12/20/21

### Chain of Custody

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

### Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4"$  for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted?

Checked by: JN 12/20/21

### Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Yes			







Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

October 25, 2021

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

RE: Sullivan GC D 1E

OrderNo.: 2110608

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 10/13/2021 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109





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

WO#: 2110608

25-Oct-21

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

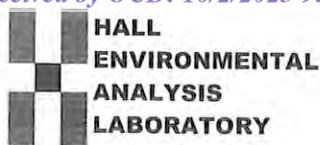
Sample ID: <b>100ng 8260 lcs</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R82204</b>			RunNo: <b>82204</b>						
Prep Date:	Analysis Date: <b>10/20/2021</b>			SeqNo: <b>2914204</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	70	130			
Toluene	20	1.0	20.00	0	102	70	130			
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.3	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		96.1	70	130			
Surr: Dibromofluoromethane	9.9		10.00		99.0	70	130			
Surr: Toluene-d8	9.7		10.00		96.9	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R82204</b>			RunNo: <b>82204</b>						
Prep Date:	Analysis Date: <b>10/20/2021</b>			SeqNo: <b>2914205</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		99.7	70	130			
Surr: 4-Bromofluorobenzene	9.5		10.00		95.4	70	130			
Surr: Dibromofluoromethane	9.9		10.00		98.9	70	130			
Surr: Toluene-d8	9.5		10.00		94.5	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2110608

RcptNo: 1

Received By: Cheyenne Cason 10/13/2021 7:20:00 AM

Completed By: Desiree Dominguez 10/13/2021 8:52:21 AM

Reviewed By: TMC 10/13/21 9:05

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4"$  for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $\leq 2$  or  $>12$  unless noted)

Adjusted?

Checked by: KPG 10/13/21

Special Handling (if applicable)

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

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.1	Good	Yes			

## Chain-of-Custody Record

Client: Hilcorp Kate Kaufman

K Kaufman @ Hilcorp.com

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other☒ EDD (Type) PDF

Project Manager: Josh Adams

Sampler: GP

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp (including CF): 3.2 - 0.1 = 3.1 (°C)

Date: 10-12 11:23

Matrix: GW

Sample Name: MW-21

Container Type and #

Preservative Type: Cool

HEAL No. 2110608

-001

Date: 10-12 14:11

Relinquished by: Gregory Palase

Date: 10/12/2023 17:54

Relinquished by: Matthew Wale

Turn-Around Time:

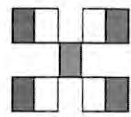
☒ Standard ☐ Rush

Project Name:

Sullivan GC D#1E

Project #:

TE 0178 21005

HALL ENVIRONMENTAL  
ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

## Analysis Request

TPH:8015D(GRO / DRO / MRO)

8081 Pesticides/8082 PCB's

EDB (Method 504.1)

PAHs by 8310 or 8270SIMS

RCRA 8 Metals

Cl, F, Br, NO<sub>3</sub>, PO<sub>4</sub>, SO<sub>4</sub>

8260 (VOA)

8270 (Semi-VOA)

Total Coliform (Present/Absent)

BTX / MTBE / TMB (8021)

X

Remarks:

Received by: JNA Wale Date: 10/12/2023 14:11

Received by: JNA Wale Date: 10/12/2023 14:11

Received by: JNA Wale Date: 10/12/2023 14:11

Received by: JNA Wale Date: 10/12/2023 14:11





Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

March 17, 2022

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

RE: 2022 Sullivan GC D 1E

OrderNo.: 2203758

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 9 sample(s) on 3/15/2022 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109



**Hall Environmental Analysis Laboratory, Inc.**

## Analytical Report

Lab Order **2203758**Date Reported: **3/17/2022**

**CLIENT:** Hilcorp Energy

**Client Sample ID:** MW-09

**Project:** 2022 Sullivan GC D 1E

**Collection Date:** 3/10/2022 12:40:00 PM

**Lab ID:** 2203758-001

**Matrix:** AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst:	CCM
Benzene	ND	1.0		µg/L	1	3/15/2022 2:09:00 PM	SL86460
Toluene	ND	1.0		µg/L	1	3/15/2022 2:09:00 PM	SL86460
Ethylbenzene	ND	1.0		µg/L	1	3/15/2022 2:09:00 PM	SL86460
Xylenes, Total	ND	1.5		µg/L	1	3/15/2022 2:09:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	3/15/2022 2:09:00 PM	SL86460
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	3/15/2022 2:09:00 PM	SL86460
Surr: Dibromofluoromethane	103	70-130		%Rec	1	3/15/2022 2:09:00 PM	SL86460
Surr: Toluene-d8	98.6	70-130		%Rec	1	3/15/2022 2:09:00 PM	SL86460

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2203758

Date Reported: 3/17/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-10

Project: 2022 Sullivan GC D 1E

Collection Date: 3/10/2022 12:55:00 PM

Lab ID: 2203758-002

Matrix: AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/15/2022 3:18:00 PM	SL86460
Toluene	ND	1.0		µg/L	1	3/15/2022 3:18:00 PM	SL86460
Ethylbenzene	ND	1.0		µg/L	1	3/15/2022 3:18:00 PM	SL86460
Xylenes, Total	ND	1.5		µg/L	1	3/15/2022 3:18:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	3/15/2022 3:18:00 PM	SL86460
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	3/15/2022 3:18:00 PM	SL86460
Surr: Dibromofluoromethane	104	70-130		%Rec	1	3/15/2022 3:18:00 PM	SL86460
Surr: Toluene-d8	99.4	70-130		%Rec	1	3/15/2022 3:18:00 PM	SL86460

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

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

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## Analytical Report

Lab Order 2203758

Date Reported: 3/17/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-11

Project: 2022 Sullivan GC D 1E

Collection Date: 3/10/2022 1:50:00 PM

Lab ID: 2203758-003

Matrix: AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/15/2022 3:41:00 PM	SL86460
Toluene	ND	1.0		µg/L	1	3/15/2022 3:41:00 PM	SL86460
Ethylbenzene	ND	1.0		µg/L	1	3/15/2022 3:41:00 PM	SL86460
Xylenes, Total	ND	1.5		µg/L	1	3/15/2022 3:41:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	110	70-130		%Rec	1	3/15/2022 3:41:00 PM	SL86460
Surr: 4-Bromofluorobenzene	99.8	70-130		%Rec	1	3/15/2022 3:41:00 PM	SL86460
Surr: Dibromofluoromethane	103	70-130		%Rec	1	3/15/2022 3:41:00 PM	SL86460
Surr: Toluene-d8	97.6	70-130		%Rec	1	3/15/2022 3:41:00 PM	SL86460

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

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

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## Analytical Report

Lab Order 2203758

Date Reported: 3/17/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-07

Project: 2022 Sullivan GC D 1E

Collection Date: 3/10/2022 2:45:00 PM

Lab ID: 2203758-004

Matrix: AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/15/2022 4:04:00 PM	SL86460
Toluene	ND	1.0		µg/L	1	3/15/2022 4:04:00 PM	SL86460
Ethylbenzene	ND	1.0		µg/L	1	3/15/2022 4:04:00 PM	SL86460
Xylenes, Total	ND	1.5		µg/L	1	3/15/2022 4:04:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	3/15/2022 4:04:00 PM	SL86460
Surr: 4-Bromofluorobenzene	99.0	70-130		%Rec	1	3/15/2022 4:04:00 PM	SL86460
Surr: Dibromofluoromethane	103	70-130		%Rec	1	3/15/2022 4:04:00 PM	SL86460
Surr: Toluene-d8	97.4	70-130		%Rec	1	3/15/2022 4:04:00 PM	SL86460

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2203758

Date Reported: 3/17/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-13

Project: 2022 Sullivan GC D 1E

Collection Date: 3/11/2022 11:05:00 AM

Lab ID: 2203758-005

Matrix: AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: CCM
Benzene	22	5.0		µg/L	5	3/15/2022 4:50:00 PM	SL86460
Toluene	5.9	5.0		µg/L	5	3/15/2022 4:50:00 PM	SL86460
Ethylbenzene	68	5.0		µg/L	5	3/15/2022 4:50:00 PM	SL86460
Xylenes, Total	3300	75		µg/L	50	3/15/2022 4:27:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	5	3/15/2022 4:50:00 PM	SL86460
Surr: 4-Bromofluorobenzene	99.8	70-130		%Rec	5	3/15/2022 4:50:00 PM	SL86460
Surr: Dibromofluoromethane	99.4	70-130		%Rec	5	3/15/2022 4:50:00 PM	SL86460
Surr: Toluene-d8	104	70-130		%Rec	5	3/15/2022 4:50:00 PM	SL86460

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

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

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## Analytical Report

Lab Order 2203758

Date Reported: 3/17/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-17

Project: 2022 Sullivan GC D 1E

Collection Date: 3/11/2022 11:35:00 AM

Lab ID: 2203758-006

Matrix: AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/15/2022 5:36:00 PM	SL86460
Toluene	ND	1.0		µg/L	1	3/15/2022 5:36:00 PM	SL86460
Ethylbenzene	ND	1.0		µg/L	1	3/15/2022 5:36:00 PM	SL86460
Xylenes, Total	ND	1.5		µg/L	1	3/15/2022 5:36:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	3/15/2022 5:36:00 PM	SL86460
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	3/15/2022 5:36:00 PM	SL86460
Surr: Dibromofluoromethane	101	70-130		%Rec	1	3/15/2022 5:36:00 PM	SL86460
Surr: Toluene-d8	100	70-130		%Rec	1	3/15/2022 5:36:00 PM	SL86460

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2203758

Date Reported: 3/17/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-15

Project: 2022 Sullivan GC D 1E

Collection Date: 3/11/2022 12:10:00 PM

Lab ID: 2203758-007

Matrix: AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: CCM
Benzene	8.6	5.0		µg/L	5	3/15/2022 6:22:00 PM	SL86460
Toluene	29	5.0		µg/L	5	3/15/2022 6:22:00 PM	SL86460
Ethylbenzene	630	50		µg/L	50	3/15/2022 5:59:00 PM	SL86460
Xylenes, Total	7400	75		µg/L	50	3/15/2022 5:59:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	5	3/15/2022 6:22:00 PM	SL86460
Surr: 4-Bromofluorobenzene	86.2	70-130		%Rec	5	3/15/2022 6:22:00 PM	SL86460
Surr: Dibromofluoromethane	100	70-130		%Rec	5	3/15/2022 6:22:00 PM	SL86460
Surr: Toluene-d8	129	70-130		%Rec	5	3/15/2022 6:22:00 PM	SL86460

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2203758

Date Reported: 3/17/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-16

Project: 2022 Sullivan GC D 1E

Collection Date: 3/11/2022 12:45:00 PM

Lab ID: 2203758-008

Matrix: AQUEOUS

Received Date: 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>							Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/15/2022 7:08:00 PM	SL86460
Toluene	ND	1.0		µg/L	1	3/15/2022 7:08:00 PM	SL86460
Ethylbenzene	ND	1.0		µg/L	1	3/15/2022 7:08:00 PM	SL86460
Xylenes, Total	ND	1.5		µg/L	1	3/15/2022 7:08:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	3/15/2022 7:08:00 PM	SL86460
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	3/15/2022 7:08:00 PM	SL86460
Surr: Dibromofluoromethane	103	70-130		%Rec	1	3/15/2022 7:08:00 PM	SL86460
Surr: Toluene-d8	101	70-130		%Rec	1	3/15/2022 7:08:00 PM	SL86460

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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**Hall Environmental Analysis Laboratory, Inc.**

## Analytical Report

Lab Order **2203758**Date Reported: **3/17/2022**

**CLIENT:** Hilcorp Energy

**Client Sample ID:** MW-21

**Project:** 2022 Sullivan GC D 1E

**Collection Date:** 3/11/2022 1:50:00 PM

**Lab ID:** 2203758-009

**Matrix:** AQUEOUS

**Received Date:** 3/15/2022 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst:	CCM
Benzene	ND	1.0		µg/L	1	3/15/2022 7:31:00 PM	SL86460
Toluene	ND	1.0		µg/L	1	3/15/2022 7:31:00 PM	SL86460
Ethylbenzene	ND	1.0		µg/L	1	3/15/2022 7:31:00 PM	SL86460
Xylenes, Total	ND	1.5		µg/L	1	3/15/2022 7:31:00 PM	SL86460
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	3/15/2022 7:31:00 PM	SL86460
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	3/15/2022 7:31:00 PM	SL86460
Surr: Dibromofluoromethane	104	70-130		%Rec	1	3/15/2022 7:31:00 PM	SL86460
Surr: Toluene-d8	96.3	70-130		%Rec	1	3/15/2022 7:31:00 PM	SL86460

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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

WO#: 2203758

17-Mar-22

**Client:** Hilcorp Energy  
**Project:** 2022 Sullivan GC D 1E

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>LCSW</b>	Batch ID: <b>R86460</b>	RunNo: <b>86460</b>								
Prep Date:	Analysis Date: <b>3/15/2022</b>	SeqNo: <b>3052230</b>	Units: <b>%Rec</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID: <b>MB</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>PBW</b>	Batch ID: <b>R86460</b>	RunNo: <b>86460</b>								
Prep Date:	Analysis Date: <b>3/15/2022</b>	SeqNo: <b>3052231</b>	Units: <b>%Rec</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.3	70	130			
Surr: Dibromofluoromethane	11		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		99.6	70	130			

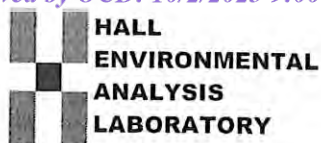
Sample ID: <b>2203758-001ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>MW-09</b>	Batch ID: <b>SL86460</b>	RunNo: <b>86460</b>								
Prep Date:	Analysis Date: <b>3/15/2022</b>	SeqNo: <b>3052233</b>	Units: <b>µg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	24	1.0	20.00	0	118	70	130			
Toluene	23	1.0	20.00	0	117	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		105	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID: <b>2203758-001amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8260: Volatiles Short List</b>								
Client ID: <b>MW-09</b>	Batch ID: <b>SL86460</b>	RunNo: <b>86460</b>								
Prep Date:	Analysis Date: <b>3/15/2022</b>	SeqNo: <b>3052234</b>	Units: <b>µg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	113	70	130	4.33	20	
Toluene	23	1.0	20.00	0	115	70	130	1.63	20	
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		104	70	130	0	0	
Surr: Toluene-d8	10		10.00		102	70	130	0	0	

**Qualifiers:**

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





*Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)*

## Sample Log-In Check List

Client Name: Hilcorp Energy

Work Order Number: 2203758

RcptNo: 1

Received By: Tracy Casarrubias 3/15/2022 7:30:00 AM

Completed By: Tracy Casarrubias 3/15/2022 9:39:42 AM

Reviewed By: KDG 3/15/22

### Chain of Custody

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

2. How was the sample delivered? Courier

[Log In](#)

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

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

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

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

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

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

9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☒

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

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

(Note discrepancies on chain of custody)

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

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

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

(If no, notify customer for authorization.)

# of preserved bottles checked for pH:

(~~<2~~ or >12 unless noted)

Adjusted?

Checked by: *me 3/15/22*

Special Handling (if applicable)

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

Person Notified:

Date:

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.3	Good	Yes			

## Chain-of-Custody Record

Client: Hilcorp  
Hitch killarugh  
Mailing Address:

Phone #: 210<sup>BR</sup> 781-915-7338  
email or Fax#: mkillevan@hickory

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance  
☐ NELAC ☐ Other \_\_\_\_\_

☐ EDD (Type) ☐ \_\_\_\_\_

Date	Time	Matrix	Sample Name
3-10-22	12:40	GW	HW-04
	12:55		HW-16
	1:50		HW-11
	2:15 <sup>PM</sup>		HW-06-BK
	2:45		HW-07
3-11-22	11:05		HW-13
	11:35		HW-17
	12:10		HW-15
	12:45		HW-16
	1:50		HW-21

date: 1/14	Time: 1522	Relinquished by: Estel Prado
date: 1/12/74	Time: 1745	Relinquished by: Michael Wood

If necessary, samples submitted to Hall Environmental may be

Turn-Around Time: ☐ Standard ☐ Rush

Project Name: 2022 Sullivan GL D#1E

Project #: TE017822021

Project Manager: Danny Burns

Sampler:	
On Ice:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
# of Coolers:	1

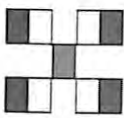
Cooler Temp (including CF): 33.0 = 33 (°C)

Container Type and #	Preservative Type	HEAL No. 2208759
-------------------------	----------------------	---------------------

3x V <sub>0A</sub>	HCl	
		001
		002
		003
		<del>004</del>
		<del>005</del> 004
		<del>006</del> 005
		<del>007</del> 006
		<del>008</del> 007
		<del>009</del> 008
		<del>010</del> 009

Received by:	Via:	Date	Time
<i>[Signature]</i>	<i>Wad</i>	3/14/22	1522
Received by:	Via:	Date	Time
<i>[Signature]</i>		3/15/22	7:30

0110122



## HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

## Analysis Request

[illegible]

Remarks:

CC: eric.carroll@wsp.com





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

October 11, 2022

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

RE: Sullivan GC D 1E

OrderNo.: 2210067

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 11 sample(s) on 10/4/2022 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-3

Project: Sullivan GC D 1E

Collection Date: 9/29/2022 11:20:00 AM

Lab ID: 2210067-001

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: BRM
Benzene	ND	1.0		µg/L	1	10/8/2022 5:11:56 AM
Toluene	ND	1.0		µg/L	1	10/8/2022 5:11:56 AM
Ethylbenzene	ND	1.0		µg/L	1	10/8/2022 5:11:56 AM
Xylenes, Total	ND	1.5		µg/L	1	10/8/2022 5:11:56 AM
Surr: 1,2-Dichloroethane-d4	122	70-130		%Rec	1	10/8/2022 5:11:56 AM
Surr: 4-Bromofluorobenzene	115	70-130		%Rec	1	10/8/2022 5:11:56 AM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/8/2022 5:11:56 AM
Surr: Toluene-d8	109	70-130		%Rec	1	10/8/2022 5:11:56 AM

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

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

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-6

Project: Sullivan GC D 1E

Collection Date: 9/29/2022 1:30:00 PM

Lab ID: 2210067-002

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: <b>BRM</b>
Benzene	240	50		µg/L	50	10/8/2022 5:38:51 AM
Toluene	2900	50		µg/L	50	10/8/2022 5:38:51 AM
Ethylbenzene	1100	50		µg/L	50	10/8/2022 5:38:51 AM
Xylenes, Total	16000	150		µg/L	100	10/10/2022 1:47:05 PM
Surr: 1,2-Dichloroethane-d4	137	70-130	S	%Rec	50	10/8/2022 5:38:51 AM
Surr: 4-Bromofluorobenzene	114	70-130		%Rec	50	10/8/2022 5:38:51 AM
Surr: Dibromofluoromethane	108	70-130		%Rec	50	10/8/2022 5:38:51 AM
Surr: Toluene-d8	108	70-130		%Rec	50	10/8/2022 5:38:51 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order **2210067**

Date Reported: 10/11/2022

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** HILCORP ENERGY

**Client Sample ID:** MW-7

**Project:** Sullivan GC D 1E

**Collection Date:** 9/29/2022 2:55:00 PM

**Lab ID:** 2210067-003

**Matrix:** AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: <b>BRM</b>
Benzene	ND	1.0		µg/L	1	10/8/2022 6:05:49 AM
Toluene	ND	1.0		µg/L	1	10/8/2022 6:05:49 AM
Ethylbenzene	ND	1.0		µg/L	1	10/8/2022 6:05:49 AM
Xylenes, Total	ND	1.5		µg/L	1	10/8/2022 6:05:49 AM
Surr: 1,2-Dichloroethane-d4	129	70-130		%Rec	1	10/8/2022 6:05:49 AM
Surr: 4-Bromofluorobenzene	109	70-130		%Rec	1	10/8/2022 6:05:49 AM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/8/2022 6:05:49 AM
Surr: Toluene-d8	102	70-130		%Rec	1	10/8/2022 6:05:49 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-11

Project: Sullivan GC D 1E

Collection Date: 9/29/2022 1:00:00 PM

Lab ID: 2210067-004

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: <b>BRM</b>
Benzene	ND	1.0		µg/L	1	10/8/2022 6:32:50 AM
Toluene	ND	1.0		µg/L	1	10/8/2022 6:32:50 AM
Ethylbenzene	ND	1.0		µg/L	1	10/8/2022 6:32:50 AM
Xylenes, Total	ND	1.5		µg/L	1	10/8/2022 6:32:50 AM
Surr: 1,2-Dichloroethane-d4	134	70-130	S	%Rec	1	10/8/2022 6:32:50 AM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	10/8/2022 6:32:50 AM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	10/8/2022 6:32:50 AM
Surr: Toluene-d8	106	70-130		%Rec	1	10/8/2022 6:32:50 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-16

Project: Sullivan GC D 1E

Collection Date: 9/29/2022 4:45:00 PM

Lab ID: 2210067-006

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: BRM
Benzene	ND	1.0		µg/L	1	10/8/2022 7:26:47 AM
Toluene	ND	1.0		µg/L	1	10/8/2022 7:26:47 AM
Ethylbenzene	ND	1.0		µg/L	1	10/8/2022 7:26:47 AM
Xylenes, Total	ND	1.5		µg/L	1	10/8/2022 7:26:47 AM
Surr: 1,2-Dichloroethane-d4	121	70-130		%Rec	1	10/8/2022 7:26:47 AM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	10/8/2022 7:26:47 AM
Surr: Dibromofluoromethane	96.7	70-130		%Rec	1	10/8/2022 7:26:47 AM
Surr: Toluene-d8	107	70-130		%Rec	1	10/8/2022 7:26:47 AM

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

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

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-17

Project: Sullivan GC D 1E

Collection Date: 9/29/2022 4:15:00 PM

Lab ID: 2210067-007

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: <b>BRM</b>
Benzene	ND	1.0		µg/L	1	10/8/2022 7:53:42 AM
Toluene	ND	1.0		µg/L	1	10/8/2022 7:53:42 AM
Ethylbenzene	ND	1.0		µg/L	1	10/8/2022 7:53:42 AM
Xylenes, Total	ND	1.5		µg/L	1	10/8/2022 7:53:42 AM
Surr: 1,2-Dichloroethane-d4	132	70-130	S	%Rec	1	10/8/2022 7:53:42 AM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	10/8/2022 7:53:42 AM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	10/8/2022 7:53:42 AM
Surr: Toluene-d8	99.9	70-130		%Rec	1	10/8/2022 7:53:42 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: PR-1

Project: Sullivan GC D 1E

Collection Date: 9/29/2022 2:10:00 PM

Lab ID: 2210067-008

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: BRM
Benzene	ND	4.0		µg/L	10	10/8/2022 8:20:40 AM
Toluene	ND	4.0		µg/L	10	10/8/2022 8:20:40 AM
Ethylbenzene	52	4.0		µg/L	10	10/8/2022 8:20:40 AM
Xylenes, Total	2700	150		µg/L	100	10/10/2022 2:14:03 PM
Surr: 1,2-Dichloroethane-d4	118	70-130		%Rec	10	10/8/2022 8:20:40 AM
Surr: 4-Bromofluorobenzene	132	70-130	S	%Rec	100	10/10/2022 2:14:03 PM
Surr: Dibromofluoromethane	92.3	70-130		%Rec	10	10/8/2022 8:20:40 AM
Surr: Toluene-d8	108	70-130		%Rec	100	10/10/2022 2:14:03 PM

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

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

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: PR-2

Project: Sullivan GC D 1E

Collection Date: 9/29/2022 12:15:00 PM

Lab ID: 2210067-009

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: BRM
Benzene	25	5.0		µg/L	5	10/8/2022 8:47:36 AM
Toluene	9.1	5.0		µg/L	5	10/8/2022 8:47:36 AM
Ethylbenzene	82	5.0		µg/L	5	10/8/2022 8:47:36 AM
Xylenes, Total	1500	30		µg/L	20	10/10/2022 2:41:03 PM
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	5	10/8/2022 8:47:36 AM
Surr: 4-Bromofluorobenzene	123	70-130		%Rec	5	10/8/2022 8:47:36 AM
Surr: Dibromofluoromethane	88.6	70-130		%Rec	5	10/8/2022 8:47:36 AM
Surr: Toluene-d8	106	70-130		%Rec	5	10/8/2022 8:47:36 AM

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

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

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-10

Project: Sullivan GC D 1E

Collection Date: 9/30/2022 10:10:00 AM

Lab ID: 2210067-010

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: <b>BRM</b>
Benzene	ND	1.0		µg/L	1	10/8/2022 9:14:32 AM
Toluene	ND	1.0		µg/L	1	10/8/2022 9:14:32 AM
Ethylbenzene	ND	1.0		µg/L	1	10/8/2022 9:14:32 AM
Xylenes, Total	ND	1.5		µg/L	1	10/8/2022 9:14:32 AM
Surr: 1,2-Dichloroethane-d4	121	70-130		%Rec	1	10/8/2022 9:14:32 AM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	10/8/2022 9:14:32 AM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	10/8/2022 9:14:32 AM
Surr: Toluene-d8	104	70-130		%Rec	1	10/8/2022 9:14:32 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2210067

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-21

Project: Sullivan GC D 1E

Collection Date: 9/30/2022 11:00:00 AM

Lab ID: 2210067-011

Matrix: AQUEOUS

Received Date: 10/4/2022 7:07:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: BRM
Benzene	ND	1.0		µg/L	1	10/8/2022 9:41:30 AM
Toluene	ND	1.0		µg/L	1	10/8/2022 9:41:30 AM
Ethylbenzene	ND	1.0		µg/L	1	10/8/2022 9:41:30 AM
Xylenes, Total	ND	1.5		µg/L	1	10/8/2022 9:41:30 AM
Surr: 1,2-Dichloroethane-d4	117	70-130		%Rec	1	10/8/2022 9:41:30 AM
Surr: 4-Bromofluorobenzene	109	70-130		%Rec	1	10/8/2022 9:41:30 AM
Surr: Dibromofluoromethane	100	70-130		%Rec	1	10/8/2022 9:41:30 AM
Surr: Toluene-d8	104	70-130		%Rec	1	10/8/2022 9:41:30 AM

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

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

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

WO#: 2210067

11-Oct-22

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>100ng lcs2</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>B91645</b>			RunNo: <b>91645</b>						
Prep Date:	Analysis Date: <b>10/8/2022</b>			SeqNo: <b>3283623</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.8	70	130			
Toluene	20	1.0	20.00	0	99.4	70	130			
Surr: 1,2-Dichloroethane-d4	12		10.00		121	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

Sample ID: <b>mb2</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>PBW</b>	Batch ID: <b>B91645</b>			RunNo: <b>91645</b>						
Prep Date:	Analysis Date: <b>10/8/2022</b>			SeqNo: <b>3283669</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	12		10.00		118	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		97.5	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.6		10.00		95.8	70	130			

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>LCSW</b>	Batch ID: <b>R91680</b>			RunNo: <b>91680</b>						
Prep Date:	Analysis Date: <b>10/10/2022</b>			SeqNo: <b>3285301</b>		Units: <b>%Rec</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	12		10.00		118	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>						
Client ID: <b>PBW</b>	Batch ID: <b>R91680</b>			RunNo: <b>91680</b>						
Prep Date:	Analysis Date: <b>10/10/2022</b>			SeqNo: <b>3285314</b>		Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	12		10.00		123	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		106	70	130			
Surr: Dibromofluoromethane	10		10.00		105	70	130			

**Qualifiers:**

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



QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2210067  
11-Oct-22

Client: HILCORP ENERGY  
Project: Sullivan GC D 1E

Sample ID: <b>mb</b>		SampType: <b>MBLK</b>			TestCode: <b>EPA Method 8260: Volatiles Short List</b>					
Client ID: <b>PBW</b>		Batch ID: <b>R91680</b>			RunNo: <b>91680</b>					
Prep Date:		Analysis Date: <b>10/10/2022</b>			SeqNo: <b>3285314</b>		Units: <b>µg/L</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Toluene-d8	10		10.00		105	70	130			

Qualifiers:

- \* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank

E Estimated value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2210067

RcptNo: 1

Received By: Juan Rojas

10/4/2022 7:07:00 AM

Completed By: Sean Livingston

10/4/2022 11:39:21 AM

Reviewed By:

KPL 10-05-22

### Chain of Custody

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

### Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4$ " for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted?

Checked by: JM 10/5/22

### Special Handling (if applicable)

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

Person Notified:

Date:

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.9	Good				

## Chain-of-Custody Record

Client: Hilcorp Farmington NM

Mailing Address: 382 Road 3100 Aztec, NM 87410

Billing Address: PO Box 61529 Houston, TX 77208

Phone #: 505-486-9543

Email or Fax#: Brandon.Sinclair@hilcorp.com

A/QC Package:

Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other

EDD (Type)

Turn-Around Time: ☒ Standard ☐ Rush

Project Name: Sullivan GC D 1E

Project #: \_\_\_\_\_

Project Manager: Kate Kaufman

Sampler: Brandon Sinclair

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp (including CP): 4.9-0.50.9

Container Type and #	Preservative Type	HEAL No.
(3) 40ml VOA	HCL/Cool	2210007

Received by: Via: Date Time

Received by: Via: Date Time

Relinquished by: 42 Sen

Relinquished by: 42 Sen

Date	Time	Matrix	Sample Name
9-29	1120	H2O	MW-3
	1330		MW-6
	1455		MW-7
	1300		MW-11
	1535		MW-13
	1645		MW-16
	1615		MW-17
	1410		PR-1
	1215		PR-2
9-30	1010		MW-10
9-30	1100		MW-21

Date: 10-3 Time: 1134

Date: 10/3/22 Time: 1800

Remarks: Special Pricing, See Andy.

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



**HALL ENVIRONMENTAL  
ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

BTEX 8021



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

October 11, 2022

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

RE: Sullivan GC D 1E

OrderNo.: 2210386

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 8 sample(s) on 10/7/2022 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109







## Analytical Report

Lab Order **2210386**

Date Reported: 10/11/2022

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** HILCORP ENERGY

**Client Sample ID:** MW-5

**Project:** Sullivan GC D 1E

**Collection Date:** 10/6/2022 9:30:00 AM

**Lab ID:** 2210386-002

**Matrix:** AQUEOUS

Received Date: 10/7/2022 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>BRM</b>
Benzene	210	10		µg/L	10	10/10/2022 11:32:00 AM
Toluene	690	10		µg/L	10	10/10/2022 11:32:00 AM
Ethylbenzene	280	10		µg/L	10	10/10/2022 11:32:00 AM
Xylenes, Total	4300	200		µg/L	100	10/10/2022 2:09:00 PM
Surr: 4-Bromofluorobenzene	203	70-130	S	%Rec	10	10/10/2022 11:32:00 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Page 2 of 9

Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
Lab Order 2210386  
Date Reported: 10/11/2022

CLIENT: HILCORP ENERGY      Client Sample ID: MW-8  
Project: Sullivan GC D 1E      Collection Date: 10/6/2022 10:55:00 AM  
Lab ID: 2210386-003      Matrix: AQUEOUS      Received Date: 10/7/2022 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: BRM
Benzene	290	5.0		µg/L	5	10/10/2022 11:51:00 AM
Toluene	850	50		µg/L	50	10/10/2022 2:29:00 PM
Ethylbenzene	210	5.0		µg/L	5	10/10/2022 11:51:00 AM
Xylenes, Total	3400	100		µg/L	50	10/10/2022 2:29:00 PM
Surr: 4-Bromofluorobenzene	157	70-130	S	%Rec	5	10/10/2022 11:51:00 AM

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

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

## Analytical Report

Lab Order 2210386

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-12

Project: Sullivan GC D 1E

Collection Date: 10/6/2022 11:20:00 AM

Lab ID: 2210386-004

Matrix: AQUEOUS

Received Date: 10/7/2022 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: BRM
Benzene	760	20		µg/L	20	10/10/2022 12:11:00 PM
Toluene	330	20		µg/L	20	10/10/2022 12:11:00 PM
Ethylbenzene	150	20		µg/L	20	10/10/2022 12:11:00 PM
Xylenes, Total	7700	400		µg/L	200	10/10/2022 2:48:00 PM
Surr: 4-Bromofluorobenzene	113	70-130		%Rec	20	10/10/2022 12:11:00 PM

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

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

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## Analytical Report

Lab Order 2210386

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-14

Project: Sullivan GC D 1E

Collection Date: 10/6/2022 11:45:00 AM

Lab ID: 2210386-005

Matrix: AQUEOUS

Received Date: 10/7/2022 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: BRM
Benzene	1900	50		µg/L	50	10/10/2022 12:31:00 PM
Toluene	7300	500		µg/L	500	10/10/2022 3:08:00 PM
Ethylbenzene	890	50		µg/L	50	10/10/2022 12:31:00 PM
Xylenes, Total	17000	1000		µg/L	500	10/10/2022 3:08:00 PM
Surr: 4-Bromofluorobenzene	109	70-130		%Rec	50	10/10/2022 12:31:00 PM

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

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

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Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
Lab Order 2210386  
Date Reported: 10/11/2022

CLIENT: HILCORP ENERGY      Client Sample ID: MW-15  
Project: Sullivan GC D 1E      Collection Date: 10/6/2022 12:10:00 PM  
Lab ID: 2210386-006      Matrix: AQUEOUS      Received Date: 10/7/2022 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: BRM
Benzene	12	5.0		µg/L	5	10/10/2022 11:12:00 AM
Toluene	63	5.0		µg/L	5	10/10/2022 11:12:00 AM
Ethylbenzene	390	5.0		µg/L	5	10/10/2022 11:12:00 AM
Xylenes, Total	3100	100		µg/L	50	10/10/2022 3:28:00 PM
Surr: 4-Bromofluorobenzene	205	70-130	S	%Rec	5	10/10/2022 11:12:00 AM

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

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



## Analytical Report

Lab Order **2210386**

Date Reported: 10/11/2022

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** HILCORP ENERGY

**Client Sample ID:** MW-18

**Project:** Sullivan GC D 1E

**Collection Date:** 10/6/2022 12:40:00 PM

**Lab ID:** 2210386-007

**Matrix:** AQUEOUS

Received Date: 10/7/2022 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>BRM</b>
Benzene	1900	50		µg/L	50	10/10/2022 12:50:00 PM
Toluene	1300	50		µg/L	50	10/10/2022 12:50:00 PM
Ethylbenzene	1000	50		µg/L	50	10/10/2022 12:50:00 PM
Xylenes, Total	10000	100		µg/L	50	10/10/2022 12:50:00 PM
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	50	10/10/2022 12:50:00 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Estimated value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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## Analytical Report

Lab Order 2210386

Date Reported: 10/11/2022

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-19

Project: Sullivan GC D 1E

Collection Date: 10/6/2022 1:10:00 PM

Lab ID: 2210386-008

Matrix: AQUEOUS

Received Date: 10/7/2022 7:45:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: BRM
Benzene	1100	100		µg/L	100	10/10/2022 3:47:00 PM
Toluene	240	10		µg/L	10	10/10/2022 1:10:00 PM
Ethylbenzene	900	10		µg/L	10	10/10/2022 1:10:00 PM
Xylenes, Total	8200	200		µg/L	100	10/10/2022 3:47:00 PM
Surr: 4-Bromofluorobenzene	243	70-130	S	%Rec	10	10/10/2022 1:10:00 PM

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

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

Page 8 of 9

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

WO#: 2210386

11-Oct-22

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>				TestCode: <b>EPA Method 8021B: Volatiles</b>					
Client ID: <b>LCSW</b>	Batch ID: <b>R91652</b>				RunNo: <b>91652</b>					
Prep Date:	Analysis Date: <b>10/10/2022</b>				SeqNo: <b>3285227</b>	Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	100	70	130			
Toluene	20	1.0	20.00	0	100	70	130			
Ethylbenzene	20	1.0	20.00	0	100	70	130			
Xylenes, Total	59	2.0	60.00	0	98.6	70	130			
Surr: 4-Bromofluorobenzene	20		20.00		98.2	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>				TestCode: <b>EPA Method 8021B: Volatiles</b>					
Client ID: <b>PBW</b>	Batch ID: <b>R91652</b>				RunNo: <b>91652</b>					
Prep Date:	Analysis Date: <b>10/10/2022</b>				SeqNo: <b>3285228</b>	Units: <b>µg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		97.3	70	130			

**Qualifiers:**

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

B Analyte detected in the associated Method Blank  
E Estimated value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2210386

RcptNo: 1

Received By: Juan Rojas

10/7/2022 7:45:00 AM

Completed By: Tracy Casarrubias

10/7/2022 8:31:49 AM

Reviewed By:

### Chain of Custody

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

### Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4"$  for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted? \_\_\_\_\_

Checked by: KPG 10.7.22

### Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Yes			



## Chain-of-Custody Record

Turn-Around Time:

☐ Standard☒ Rush 10-11-22

Project Name:

Sullivan GC P I E

Project #:

Phone #:

mail or Fax# Brandon Sinclair@hilcorp.com

QA/QC Package:

☐ Standard☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC☐ Other☐ EDD (Type)

Project Manager:

Kater Kaufman

Sampler:

Brandon Sinclair

On Ice: ☐ Yes ☐ No

# of Coolers:

Cooler Temp (including CFI): 26-05-2.6 (°C)

Date Time Matrix Sample Name

10-6 1000 H<sub>2</sub>O MW-2

0930 MW-5

1055 MW-8

1120 MW-12

1145 MW-14

1210 MW-15

1240 MW-18

1310 MW-14

Container Type and #

3x40m LVA

Preservative Type

HCL

HEAL No.

220386

001

002

003

004

005

006

007

008

BTEX / MTBE / TMB's (8021)

TPH:8015D(GRO / DRO / MRO)

8081 Pesticides/8082 PCB's

EDB (Method 504.1)

PAHs by 8310 or 8270SIMS

RCRA 8 Metals

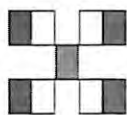
Cl, F, Br, NO<sub>3</sub>, NO<sub>2</sub>, PO<sub>4</sub>, SO<sub>4</sub>

8260 (VOA)

8270 (Semi-VOA)

Total Coliform (Present/Absent)

## Analysis Request



## HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Remarks:

Received by: Via: Date Time

CMA West 10/6/22 1449

Relinquished by: Relinquished by: Date Time

CMA West 10/6/22 1449





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

January 04, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Sullivan

OrderNo.: 2212B13

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 12 sample(s) on 12/17/2022 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

CLIENT: HILCORP ENERGY

Client Sample ID: MW-01

Project: Sullivan

Collection Date: 12/16/2022 2:38:00 PM

Lab ID: 2212B13-001

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: JR
Benzene	ND	2.5		µg/L	5	12/29/2022 1:33:54 PM
Toluene	11	5.0		µg/L	5	12/29/2022 1:33:54 PM
Ethylbenzene	19	5.0		µg/L	5	12/29/2022 1:33:54 PM
Xylenes, Total	400	7.5		µg/L	5	12/29/2022 1:33:54 PM
Surr: 1,2-Dichloroethane-d4	92.9	70-130		%Rec	5	12/29/2022 1:33:54 PM
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	5	12/29/2022 1:33:54 PM
Surr: Dibromofluoromethane	88.9	70-130		%Rec	5	12/29/2022 1:33:54 PM
Surr: Toluene-d8	106	70-130		%Rec	5	12/29/2022 1:33:54 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-03

Project: Sullivan

Collection Date: 12/16/2022 2:22:00 PM

Lab ID: 2212B13-002

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 1:49:33 AM
Toluene	ND	1.0		µg/L	1	12/29/2022 1:49:33 AM
Ethylbenzene	ND	1.0		µg/L	1	12/29/2022 1:49:33 AM
Xylenes, Total	2.4	1.5		µg/L	1	12/29/2022 1:49:33 AM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	12/29/2022 1:49:33 AM
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	12/29/2022 1:49:33 AM
Surr: Dibromofluoromethane	91.7	70-130		%Rec	1	12/29/2022 1:49:33 AM
Surr: Toluene-d8	109	70-130		%Rec	1	12/29/2022 1:49:33 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-06

Project: Sullivan

Collection Date: 12/16/2022 2:54:00 PM

Lab ID: 2212B13-003

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: JR
Benzene	170	100	P	µg/L	100	12/29/2022 2:18:03 AM
Toluene	3200	100	P	µg/L	100	12/29/2022 2:18:03 AM
Ethylbenzene	1700	100	P	µg/L	100	12/29/2022 2:18:03 AM
Xylenes, Total	21000	1500		µg/L	1000	12/29/2022 9:11:22 PM
Surr: 1,2-Dichloroethane-d4	97.4	70-130	P	%Rec	100	12/29/2022 2:18:03 AM
Surr: 4-Bromofluorobenzene	101	70-130	P	%Rec	100	12/29/2022 2:18:03 AM
Surr: Dibromofluoromethane	85.9	70-130	P	%Rec	100	12/29/2022 2:18:03 AM
Surr: Toluene-d8	112	70-130	P	%Rec	100	12/29/2022 2:18:03 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-07

Project: Sullivan

Collection Date: 12/16/2022 2:05:00 PM

Lab ID: 2212B13-004

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 2:46:35 AM
Toluene	ND	1.0		µg/L	1	12/29/2022 2:46:35 AM
Ethylbenzene	ND	1.0		µg/L	1	12/29/2022 2:46:35 AM
Xylenes, Total	ND	1.5		µg/L	1	12/29/2022 2:46:35 AM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	12/29/2022 2:46:35 AM
Surr: 4-Bromofluorobenzene	111	70-130		%Rec	1	12/29/2022 2:46:35 AM
Surr: Dibromofluoromethane	90.0	70-130		%Rec	1	12/29/2022 2:46:35 AM
Surr: Toluene-d8	108	70-130		%Rec	1	12/29/2022 2:46:35 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		



## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-09

Project: Sullivan

Collection Date: 12/16/2022 1:50:00 PM

Lab ID: 2212B13-005

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 3:15:04 AM
Toluene	ND	1.0		µg/L	1	12/29/2022 3:15:04 AM
Ethylbenzene	ND	1.0		µg/L	1	12/29/2022 3:15:04 AM
Xylenes, Total	ND	1.5		µg/L	1	12/29/2022 3:15:04 AM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	12/29/2022 3:15:04 AM
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	1	12/29/2022 3:15:04 AM
Surr: Dibromofluoromethane	89.3	70-130		%Rec	1	12/29/2022 3:15:04 AM
Surr: Toluene-d8	107	70-130		%Rec	1	12/29/2022 3:15:04 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-10

Project: Sullivan

Collection Date: 12/16/2022 3:39:00 PM

Lab ID: 2212B13-006

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 3:43:33 AM
Toluene	ND	1.0		µg/L	1	12/29/2022 3:43:33 AM
Ethylbenzene	ND	1.0		µg/L	1	12/29/2022 3:43:33 AM
Xylenes, Total	ND	1.5		µg/L	1	12/29/2022 3:43:33 AM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	12/29/2022 3:43:33 AM
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	1	12/29/2022 3:43:33 AM
Surr: Dibromofluoromethane	93.9	70-130		%Rec	1	12/29/2022 3:43:33 AM
Surr: Toluene-d8	109	70-130		%Rec	1	12/29/2022 3:43:33 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-11

Project: Sullivan

Collection Date: 12/16/2022 3:15:00 PM

Lab ID: 2212B13-007

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 4:12:01 AM
Toluene	ND	1.0		µg/L	1	12/29/2022 4:12:01 AM
Ethylbenzene	ND	1.0		µg/L	1	12/29/2022 4:12:01 AM
Xylenes, Total	ND	1.5		µg/L	1	12/29/2022 4:12:01 AM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	12/29/2022 4:12:01 AM
Surr: 4-Bromofluorobenzene	115	70-130		%Rec	1	12/29/2022 4:12:01 AM
Surr: Dibromofluoromethane	87.9	70-130		%Rec	1	12/29/2022 4:12:01 AM
Surr: Toluene-d8	112	70-130		%Rec	1	12/29/2022 4:12:01 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-15

Project: Sullivan

Collection Date: 12/16/2022 12:46:00 PM

Lab ID: 2212B13-008

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: JR
Benzene	ND	2.5		µg/L	5	12/29/2022 9:39:59 PM
Toluene	7.0	5.0		µg/L	5	12/29/2022 9:39:59 PM
Ethylbenzene	130	5.0		µg/L	5	12/29/2022 9:39:59 PM
Xylenes, Total	550	7.5		µg/L	5	12/29/2022 9:39:59 PM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	5	12/29/2022 9:39:59 PM
Surr: 4-Bromofluorobenzene	90.5	70-130		%Rec	5	12/29/2022 9:39:59 PM
Surr: Dibromofluoromethane	91.2	70-130		%Rec	5	12/29/2022 9:39:59 PM
Surr: Toluene-d8	107	70-130		%Rec	5	12/29/2022 9:39:59 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-16

Project: Sullivan

Collection Date: 12/16/2022 12:50:00 PM

Lab ID: 2212B13-009

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 5:09:03 AM
Toluene	ND	1.0		µg/L	1	12/29/2022 5:09:03 AM
Ethylbenzene	ND	1.0		µg/L	1	12/29/2022 5:09:03 AM
Xylenes, Total	ND	1.5		µg/L	1	12/29/2022 5:09:03 AM
Surr: 1,2-Dichloroethane-d4	90.4	70-130		%Rec	1	12/29/2022 5:09:03 AM
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	12/29/2022 5:09:03 AM
Surr: Dibromofluoromethane	88.2	70-130		%Rec	1	12/29/2022 5:09:03 AM
Surr: Toluene-d8	108	70-130		%Rec	1	12/29/2022 5:09:03 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		



## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-17

Project: Sullivan

Collection Date: 12/16/2022 1:12:00 PM

Lab ID: 2212B13-010

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 5:37:35 AM
Toluene	ND	1.0		µg/L	1	12/29/2022 5:37:35 AM
Ethylbenzene	ND	1.0		µg/L	1	12/29/2022 5:37:35 AM
Xylenes, Total	ND	1.5		µg/L	1	12/29/2022 5:37:35 AM
Surr: 1,2-Dichloroethane-d4	99.4	70-130		%Rec	1	12/29/2022 5:37:35 AM
Surr: 4-Bromofluorobenzene	112	70-130		%Rec	1	12/29/2022 5:37:35 AM
Surr: Dibromofluoromethane	90.9	70-130		%Rec	1	12/29/2022 5:37:35 AM
Surr: Toluene-d8	109	70-130		%Rec	1	12/29/2022 5:37:35 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-21

Project: Sullivan

Collection Date: 12/16/2022 4:16:00 PM

Lab ID: 2212B13-011

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: JR
Benzene	ND	1.0		µg/L	1	12/29/2022 6:06:06 AM
Toluene	11	1.0		µg/L	1	12/29/2022 6:06:06 AM
Ethylbenzene	11	1.0		µg/L	1	12/29/2022 6:06:06 AM
Xylenes, Total	190	1.5		µg/L	1	12/29/2022 6:06:06 AM
Surr: 1,2-Dichloroethane-d4	95.8	70-130		%Rec	1	12/29/2022 6:06:06 AM
Surr: 4-Bromofluorobenzene	91.8	70-130		%Rec	1	12/29/2022 6:06:06 AM
Surr: Dibromofluoromethane	92.4	70-130		%Rec	1	12/29/2022 6:06:06 AM
Surr: Toluene-d8	107	70-130		%Rec	1	12/29/2022 6:06:06 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2212B13

Date Reported: 1/4/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-22

Project: Sullivan

Collection Date: 12/16/2022 4:08:00 PM

Lab ID: 2212B13-012

Matrix: GROUNDWA

Received Date: 12/17/2022 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260: VOLATILES SHORT LIST</b>						Analyst: JR
Benzene	35	2.5		µg/L	5	12/29/2022 2:02:36 PM
Toluene	ND	2.5		µg/L	5	12/29/2022 2:02:36 PM
Ethylbenzene	ND	2.5		µg/L	5	12/29/2022 2:02:36 PM
Xylenes, Total	ND	5.0		µg/L	5	12/29/2022 2:02:36 PM
Surr: 1,2-Dichloroethane-d4	94.7	70-130		%Rec	5	12/29/2022 2:02:36 PM
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	5	12/29/2022 2:02:36 PM
Surr: Dibromofluoromethane	92.2	70-130		%Rec	5	12/29/2022 2:02:36 PM
Surr: Toluene-d8	108	70-130		%Rec	5	12/29/2022 2:02:36 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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

WO#: 2212B13

04-Jan-23

**Client:** HILCORP ENERGY**Project:** Sullivan

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>SL93599</b>		RunNo: <b>93599</b>							
Prep Date:	Analysis Date: <b>12/28/2022</b>		SeqNo: <b>3377401</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.6	70	130			
Toluene	21	1.0	20.00	0	104	70	130			
Surr: 1,2-Dichloroethane-d4	9.6		10.00		96.1	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		113	70	130			
Surr: Dibromofluoromethane	8.6		10.00		86.3	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>PBW</b>	Batch ID: <b>SL93599</b>		RunNo: <b>93599</b>							
Prep Date:	Analysis Date: <b>12/28/2022</b>		SeqNo: <b>3377415</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.6	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		111	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.4	70	130			
Surr: Toluene-d8	11		10.00		109	70	130			

Sample ID: <b>100ng lcs</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>SL93635</b>		RunNo: <b>93635</b>							
Prep Date:	Analysis Date: <b>12/29/2022</b>		SeqNo: <b>3378978</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.3	70	130			
Toluene	21	1.0	20.00	0	103	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.1	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8260: Volatiles Short List</b>							
Client ID: <b>PBW</b>	Batch ID: <b>SL93635</b>		RunNo: <b>93635</b>							
Prep Date:	Analysis Date: <b>12/29/2022</b>		SeqNo: <b>3378983</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

Page 13 of 14

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2212B13  
04-Jan-23

Client: HILCORP ENERGY  
Project: Sullivan

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: PBW	Batch ID: SL93635	RunNo: 93635								
Prep Date:	Analysis Date: 12/29/2022	SeqNo: 3378983 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.0		10.00		89.9	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		109	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.4	70	130			
Surr: Toluene-d8	11		10.00		105	70	130			

Qualifiers:

- \* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of standard limits. If undiluted results may be estimated.
- B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit





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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2212B13

RcptNo: 1

Received By: Desiree Dominguez 12/17/2022 10:00:00 AM

Completed By: Sean Livingston 12/19/2022 3:29:50 PM

Reviewed By: *JN 12/20/22*

*DD*

*Sean Livingston*

### Chain of Custody

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

2. How was the sample delivered? Courier

### Log In

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

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

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

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

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

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

9. Received at least 1 vial with headspace  $<1/4"$  for AQ VOA? Yes ☒ No ☐ NA ☐

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

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

(Note discrepancies on chain of custody)

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

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

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

(If no, notify customer for authorization.)

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted? \_\_\_\_\_

Checked by: *KPG 12.20.22*

### Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.7	Good				





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

March 24, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Sullivan

OrderNo.: 2303971

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 16 sample(s) on 3/18/2023 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
Lab Order 2303971  
Date Reported: 3/24/2023

CLIENT: HILCORP ENERGY      Client Sample ID: PR-1  
Project: Sullivan      Collection Date: 3/16/2023 12:30:00 PM  
Lab ID: 2303971-001      Matrix: AQUEOUS      Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	5.0	D	µg/L	10	3/21/2023 10:31:00 PM
Toluene	ND	10	D	µg/L	10	3/21/2023 10:31:00 PM
Ethylbenzene	24	10	D	µg/L	10	3/21/2023 10:31:00 PM
Xylenes, Total	1300	20	D	µg/L	10	3/21/2023 10:31:00 PM
Surr: 4-Bromofluorobenzene	147	70-130	SD	%Rec	10	3/21/2023 10:31:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
Lab Order 2303971  
Date Reported: 3/24/2023

CLIENT: HILCORP ENERGY      Client Sample ID: MW02  
Project: Sullivan      Collection Date: 3/16/2023 12:40:00 PM  
Lab ID: 2303971-002      Matrix: AQUEOUS      Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	8.0	D	µg/L	20	3/21/2023 11:14:00 PM
Toluene	ND	8.0	D	µg/L	20	3/21/2023 11:14:00 PM
Ethylbenzene	ND	8.0	D	µg/L	20	3/21/2023 11:14:00 PM
Xylenes, Total	63	40	D	µg/L	20	3/21/2023 11:14:00 PM
Surr: 4-Bromofluorobenzene	147	70-130	SD	%Rec	20	3/21/2023 11:14:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		



## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW05

Project: Sullivan

Collection Date: 3/16/2023 1:00:00 PM

Lab ID: 2303971-003

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	350	10		µg/L	10	3/21/2023 11:58:00 PM
Toluene	440	10		µg/L	10	3/21/2023 11:58:00 PM
Ethylbenzene	190	10		µg/L	10	3/21/2023 11:58:00 PM
Xylenes, Total	6100	200		µg/L	100	3/21/2023 11:36:00 PM
Surr: 4-Bromofluorobenzene	148	70-130	S	%Rec	10	3/21/2023 11:58:00 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order **2303971**

Date Reported: 3/24/2023

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT: HILCORP ENERGY**

**Client Sample ID:** MW06

**Project:** Sullivan

**Collection Date:** 3/16/2023 12:12:00 PM

**Lab ID:** 2303971-004

**Matrix:** AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8021B: VOLATILES</b>						Analyst: <b>CCM</b>
Benzene	30	10		µg/L	10	3/22/2023 12:41:00 AM
Toluene	760	10		µg/L	10	3/22/2023 12:41:00 AM
Ethylbenzene	560	10		µg/L	10	3/22/2023 12:41:00 AM
Xylenes, Total	7500	200		µg/L	100	3/22/2023 12:20:00 AM
Surr: 4-Bromofluorobenzene	163	70-130	S	%Rec	10	3/22/2023 12:41:00 AM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

CLIENT: HILCORP ENERGY

Client Sample ID: MW07

Project: Sullivan

Collection Date: 3/16/2023 1:25:00 PM

Lab ID: 2303971-005

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 1:03:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 1:03:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 1:03:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 1:03:00 AM
Surr: 4-Bromofluorobenzene	98.7	70-130		%Rec	1	3/22/2023 1:03:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW12

Project: Sullivan

Collection Date: 3/16/2023 1:45:00 PM

Lab ID: 2303971-006

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	470	20		µg/L	20	3/22/2023 2:08:00 AM
Toluene	58	20		µg/L	20	3/22/2023 2:08:00 AM
Ethylbenzene	100	20		µg/L	20	3/22/2023 2:08:00 AM
Xylenes, Total	3200	40		µg/L	20	3/22/2023 2:08:00 AM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	20	3/22/2023 2:08:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

CLIENT: HILCORP ENERGY

Client Sample ID: MW13

Project: Sullivan

Collection Date: 3/16/2023 3:15:00 PM

Lab ID: 2303971-007

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	4.3	2.5		µg/L	5	3/22/2023 2:29:00 AM
Toluene	ND	5.0		µg/L	5	3/22/2023 2:29:00 AM
Ethylbenzene	33	5.0		µg/L	5	3/22/2023 2:29:00 AM
Xylenes, Total	110	10		µg/L	5	3/22/2023 2:29:00 AM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	5	3/22/2023 2:29:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		



## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW15

Project: Sullivan

Collection Date: 3/16/2023 2:35:00 PM

Lab ID: 2303971-008

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 2:51:00 AM
Toluene	2.8	1.0		µg/L	1	3/22/2023 2:51:00 AM
Ethylbenzene	49	1.0		µg/L	1	3/22/2023 2:51:00 AM
Xylenes, Total	200	2.0		µg/L	1	3/22/2023 2:51:00 AM
Surr: 4-Bromofluorobenzene	192	70-130	S	%Rec	1	3/22/2023 2:51:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW16

Project: Sullivan

Collection Date: 3/16/2023 2:50:00 PM

Lab ID: 2303971-009

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 3:13:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 3:13:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 3:13:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 3:13:00 AM
Surr: 4-Bromofluorobenzene	99.6	70-130		%Rec	1	3/22/2023 3:13:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW17

Project: Sullivan

Collection Date: 3/16/2023 3:30:00 PM

Lab ID: 2303971-010

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 3:34:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 3:34:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 3:34:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 3:34:00 AM
Surr: 4-Bromofluorobenzene	97.6	70-130		%Rec	1	3/22/2023 3:34:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW03

Project: Sullivan

Collection Date: 3/17/2023 10:55:00 AM

Lab ID: 2303971-011

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 3:56:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 3:56:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 3:56:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 3:56:00 AM
Surr: 4-Bromofluorobenzene	97.3	70-130		%Rec	1	3/22/2023 3:56:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW09

Project: Sullivan

Collection Date: 3/17/2023 11:10:00 AM

Lab ID: 2303971-012

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 4:17:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 4:17:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 4:17:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 4:17:00 AM
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	3/22/2023 4:17:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW10

Project: Sullivan

Collection Date: 3/17/2023 11:45:00 AM

Lab ID: 2303971-013

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 4:39:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 4:39:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 4:39:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 4:39:00 AM
Surr: 4-Bromofluorobenzene	97.1	70-130		%Rec	1	3/22/2023 4:39:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW11

Project: Sullivan

Collection Date: 3/17/2023 10:37:00 AM

Lab ID: 2303971-014

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 5:01:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 5:01:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 5:01:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 5:01:00 AM
Surr: 4-Bromofluorobenzene	93.9	70-130		%Rec	1	3/22/2023 5:01:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Hall Environmental Analysis Laboratory, Inc.

Analytical Report  
Lab Order 2303971  
Date Reported: 3/24/2023

CLIENT: HILCORP ENERGY      Client Sample ID: MW21  
Project: Sullivan      Collection Date: 3/17/2023 12:40:00 PM  
Lab ID: 2303971-015      Matrix: AQUEOUS      Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	3/22/2023 5:22:00 AM
Toluene	ND	1.0		µg/L	1	3/22/2023 5:22:00 AM
Ethylbenzene	ND	1.0		µg/L	1	3/22/2023 5:22:00 AM
Xylenes, Total	ND	2.0		µg/L	1	3/22/2023 5:22:00 AM
Surr: 4-Bromofluorobenzene	97.0	70-130		%Rec	1	3/22/2023 5:22:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order 2303971

Date Reported: 3/24/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW22

Project: Sullivan

Collection Date: 3/17/2023 12:20:00 PM

Lab ID: 2303971-016

Matrix: AQUEOUS

Received Date: 3/18/2023 7:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: CCM
Benzene	13	5.0		µg/L	5	3/22/2023 6:05:00 AM
Toluene	ND	5.0		µg/L	5	3/22/2023 6:05:00 AM
Ethylbenzene	ND	5.0		µg/L	5	3/22/2023 6:05:00 AM
Xylenes, Total	14	10		µg/L	5	3/22/2023 6:05:00 AM
Surr: 4-Bromofluorobenzene	99.7	70-130		%Rec	5	3/22/2023 6:05:00 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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

WO#: 2303971

24-Mar-23

**Client:** HILCORP ENERGY**Project:** Sullivan

Sample ID: <b>2303971-005ams</b>	SampType: <b>MS</b>		TestCode: <b>EPA Method 8021B: Volatiles</b>							
Client ID: <b>MW07</b>	Batch ID: <b>R95451</b>		RunNo: <b>95451</b>							
Prep Date:	Analysis Date: <b>3/22/2023</b>		SeqNo: <b>3452931</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.8	70	130			
Toluene	20	1.0	20.00	0	98.4	70	130			
Ethylbenzene	19	1.0	20.00	0	97.4	70	130			
Xylenes, Total	58	2.0	60.00	0.3490	96.7	70	130			
1,2,4-Trimethylbenzene	18	1.0	20.00	0	92.4	70	130			
1,3,5-Trimethylbenzene	18	1.0	20.00	0	88.7	70	130			
Surr: 4-Bromofluorobenzene	19		20.00		95.8	70	130			

Sample ID: <b>2303971-005amsd</b>	SampType: <b>MSD</b>		TestCode: <b>EPA Method 8021B: Volatiles</b>							
Client ID: <b>MW07</b>	Batch ID: <b>R95451</b>		RunNo: <b>95451</b>							
Prep Date:	Analysis Date: <b>3/22/2023</b>		SeqNo: <b>3452932</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	93.0	70	130	5.02	20	
Toluene	19	1.0	20.00	0	93.5	70	130	5.10	20	
Ethylbenzene	19	1.0	20.00	0	93.3	70	130	4.24	20	
Xylenes, Total	56	2.0	60.00	0.3490	93.0	70	130	3.90	20	
1,2,4-Trimethylbenzene	18	1.0	20.00	0	91.4	70	130	1.12	20	
1,3,5-Trimethylbenzene	18	1.0	20.00	0	88.0	70	130	0.830	20	
Surr: 4-Bromofluorobenzene	19		20.00		95.7	70	130	0	0	

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8021B: Volatiles</b>							
Client ID: <b>LCSW</b>	Batch ID: <b>R95451</b>		RunNo: <b>95451</b>							
Prep Date:	Analysis Date: <b>3/21/2023</b>		SeqNo: <b>3453396</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.7	70	130			
Toluene	20	1.0	20.00	0	98.8	70	130			
Ethylbenzene	20	1.0	20.00	0	99.2	70	130			
Xylenes, Total	59	2.0	60.00	0	99.1	70	130			
1,2,4-Trimethylbenzene	20	1.0	20.00	0	102	70	130			
1,3,5-Trimethylbenzene	20	1.0	20.00	0	98.6	70	130			
Surr: 4-Bromofluorobenzene	20		20.00		99.2	70	130			

Sample ID: <b>mb 2</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8021B: Volatiles</b>							
Client ID: <b>PBW</b>	Batch ID: <b>R95451</b>		RunNo: <b>95451</b>							
Prep Date:	Analysis Date: <b>3/21/2023</b>		SeqNo: <b>3455119</b>		Units: <b>µg/L</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit



QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2303971

24-Mar-23

Client: HILCORP ENERGY

Project: Sullivan

Sample ID: mb 2	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBW	Batch ID: R95451	RunNo: 95451								
Prep Date:	Analysis Date: 3/21/2023	SeqNo: 3455119 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
Surr: 4-Bromofluorobenzene	19		20.00		97.5	70	130			

Qualifiers:

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit



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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2303971

RcptNo: 1

Received By: Juan Rojas 3/18/2023 7:40:00 AM

Completed By: Juan Rojas 3/18/2023 7:56:43 AM

Reviewed By: KPG 3.20.23

*Juan Rojas*

*Juan Rojas*

### Chain of Custody

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

### Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of  $>0^{\circ}\text{C}$  to  $6.0^{\circ}\text{C}$ ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace  $<1/4$ " for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

( $<2$  or  $>12$  unless noted)

Adjusted? \_\_\_\_\_

Checked by: *ju 3/20/23*

### Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0	Good	<i>Monty</i>			

*nr 3/20/23*







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

May 26, 2023

Stuart Hyde

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX

RE: Sullivan GC D 1E

OrderNo.: 2305713

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 16 sample(s) on 5/12/2023 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](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

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

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109



## Analytical Report

Lab Order: 2305713

Date Reported: 5/26/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2305713

Project: Sullivan GC D 1E

Lab ID: 2305713-001

Collection Date: 5/9/2023 12:15:00 PM

Client Sample ID: MW03

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/16/2023 7:42:00 PM	B96798
Toluene	ND	1.0		µg/L	1	5/16/2023 7:42:00 PM	B96798
Ethylbenzene	ND	1.0		µg/L	1	5/16/2023 7:42:00 PM	B96798
Xylenes, Total	ND	2.0		µg/L	1	5/16/2023 7:42:00 PM	B96798
Surr: 4-Bromofluorobenzene	92.9	52.4-148		%Rec	1	5/16/2023 7:42:00 PM	B96798

Lab ID: 2305713-002

Collection Date: 5/9/2023 12:55:00 PM

Client Sample ID: MW07

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/16/2023 8:46:00 PM	B96798
Toluene	ND	1.0		µg/L	1	5/16/2023 8:46:00 PM	B96798
Ethylbenzene	ND	1.0		µg/L	1	5/16/2023 8:46:00 PM	B96798
Xylenes, Total	ND	2.0		µg/L	1	5/16/2023 8:46:00 PM	B96798
Surr: 4-Bromofluorobenzene	95.5	52.4-148		%Rec	1	5/16/2023 8:46:00 PM	B96798

Lab ID: 2305713-003

Collection Date: 5/9/2023 1:45:00 PM

Client Sample ID: MW09

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/16/2023 9:08:00 PM	B96798
Toluene	ND	1.0		µg/L	1	5/16/2023 9:08:00 PM	B96798
Ethylbenzene	ND	1.0		µg/L	1	5/16/2023 9:08:00 PM	B96798
Xylenes, Total	ND	2.0		µg/L	1	5/16/2023 9:08:00 PM	B96798
Surr: 4-Bromofluorobenzene	93.9	52.4-148		%Rec	1	5/16/2023 9:08:00 PM	B96798

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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## Analytical Report

Lab Order: 2305713

Date Reported: 5/26/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2305713

Project: Sullivan GC D 1E

Lab ID: 2305713-004

Collection Date: 5/9/2023 1:45:00 PM

Client Sample ID: MW10

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/16/2023 9:29:00 PM	B96798
Toluene	ND	1.0		µg/L	1	5/16/2023 9:29:00 PM	B96798
Ethylbenzene	ND	1.0		µg/L	1	5/16/2023 9:29:00 PM	B96798
Xylenes, Total	ND	2.0		µg/L	1	5/16/2023 9:29:00 PM	B96798
Surr: 4-Bromofluorobenzene	93.6	52.4-148		%Rec	1	5/16/2023 9:29:00 PM	B96798

Lab ID: 2305713-005

Collection Date: 5/9/2023 1:26:00 PM

Client Sample ID: MW11

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/16/2023 9:51:00 PM	B96798
Toluene	ND	1.0		µg/L	1	5/16/2023 9:51:00 PM	B96798
Ethylbenzene	ND	1.0		µg/L	1	5/16/2023 9:51:00 PM	B96798
Xylenes, Total	ND	2.0		µg/L	1	5/16/2023 9:51:00 PM	B96798
Surr: 4-Bromofluorobenzene	93.9	52.4-148		%Rec	1	5/16/2023 9:51:00 PM	B96798

Lab ID: 2305713-006

Collection Date: 5/9/2023 2:45:00 PM

Client Sample ID: MW15

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	2.0		µg/L	5	5/22/2023 6:22:00 PM	BW969
Toluene	8.1	5.0		µg/L	5	5/22/2023 6:22:00 PM	BW969
Ethylbenzene	210	5.0		µg/L	5	5/22/2023 6:22:00 PM	BW969
Xylenes, Total	850	10		µg/L	5	5/22/2023 6:22:00 PM	BW969
Surr: 4-Bromofluorobenzene	144	52.4-148		%Rec	5	5/22/2023 6:22:00 PM	BW969

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order: 2305713

Date Reported: 5/26/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2305713

Project: Sullivan GC D 1E

Lab ID: 2305713-007

Collection Date: 5/9/2023 2:45:00 PM

Client Sample ID: MW16

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/18/2023 12:58:00 AM	BW968
Toluene	ND	1.0		µg/L	1	5/18/2023 12:58:00 AM	BW968
Ethylbenzene	ND	1.0		µg/L	1	5/18/2023 12:58:00 AM	BW968
Xylenes, Total	ND	2.0		µg/L	1	5/18/2023 12:58:00 AM	BW968
Surr: 4-Bromofluorobenzene	89.8	52.4-148		%Rec	1	5/18/2023 12:58:00 AM	BW968

Lab ID: 2305713-008

Collection Date: 5/9/2023 3:01:00 PM

Client Sample ID: MW17

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/18/2023 1:20:00 AM	BW968
Toluene	ND	1.0		µg/L	1	5/18/2023 1:20:00 AM	BW968
Ethylbenzene	ND	1.0		µg/L	1	5/18/2023 1:20:00 AM	BW968
Xylenes, Total	ND	2.0		µg/L	1	5/18/2023 1:20:00 AM	BW968
Surr: 4-Bromofluorobenzene	93.7	52.4-148		%Rec	1	5/18/2023 1:20:00 AM	BW968

Lab ID: 2305713-009

Collection Date: 5/11/2023 10:15:00 AM

Client Sample ID: MW21

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/19/2023 12:14:00 AM	BW968
Toluene	ND	1.0		µg/L	1	5/19/2023 12:14:00 AM	BW968
Ethylbenzene	ND	1.0		µg/L	1	5/19/2023 12:14:00 AM	BW968
Xylenes, Total	ND	2.0		µg/L	1	5/19/2023 12:14:00 AM	BW968
Surr: 4-Bromofluorobenzene	93.7	52.4-148		%Rec	1	5/19/2023 12:14:00 AM	BW968

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order: 2305713

Date Reported: 5/26/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2305713

Project: Sullivan GC D 1E

Lab ID: 2305713-010

Collection Date: 5/11/2023 11:00:00 AM

Client Sample ID: MW22

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES							Analyst: KMN
Benzene	5.6	2.5		µg/L	5	5/19/2023 12:35:00 AM	BW968
Toluene	ND	2.5		µg/L	5	5/19/2023 12:35:00 AM	BW968
Ethylbenzene	ND	2.5		µg/L	5	5/19/2023 12:35:00 AM	BW968
Xylenes, Total	11	5.0		µg/L	5	5/19/2023 12:35:00 AM	BW968
Surr: 4-Bromofluorobenzene	92.9	52.4-148		%Rec	5	5/19/2023 12:35:00 AM	BW968

Lab ID: 2305713-011

Collection Date: 5/11/2023 11:50:00 AM

Client Sample ID: MW25

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES							Analyst: KMN
Benzene	56	20		µg/L	20	5/19/2023 1:39:00 AM	BW968
Toluene	180	20		µg/L	20	5/19/2023 1:39:00 AM	BW968
Ethylbenzene	330	20		µg/L	20	5/19/2023 1:39:00 AM	BW968
Xylenes, Total	4200	40		µg/L	20	5/19/2023 1:39:00 AM	BW968
Surr: 4-Bromofluorobenzene	104	52.4-148		%Rec	20	5/19/2023 1:39:00 AM	BW968

Lab ID: 2305713-012

Collection Date: 5/11/2023 12:36:00 PM

Client Sample ID: MW26

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/19/2023 2:01:00 AM	BW968
Toluene	ND	1.0		µg/L	1	5/19/2023 2:01:00 AM	BW968
Ethylbenzene	ND	1.0		µg/L	1	5/19/2023 2:01:00 AM	BW968
Xylenes, Total	ND	2.0		µg/L	1	5/19/2023 2:01:00 AM	BW968
Surr: 4-Bromofluorobenzene	91.8	52.4-148		%Rec	1	5/19/2023 2:01:00 AM	BW968

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

## Analytical Report

Lab Order: 2305713

Date Reported: 5/26/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2305713

Project: Sullivan GC D 1E

Lab ID: 2305713-013

Collection Date: 5/11/2023 1:10:00 PM

Client Sample ID: MW27

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/19/2023 2:23:00 AM	BW968
Toluene	ND	1.0		µg/L	1	5/19/2023 2:23:00 AM	BW968
Ethylbenzene	ND	1.0		µg/L	1	5/19/2023 2:23:00 AM	BW968
Xylenes, Total	ND	2.0		µg/L	1	5/19/2023 2:23:00 AM	BW968
Surr: 4-Bromofluorobenzene	91.1	52.4-148		%Rec	1	5/19/2023 2:23:00 AM	BW968

Lab ID: 2305713-014

Collection Date: 5/11/2023 1:40:00 PM

Client Sample ID: MW28

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	ND	1.0		µg/L	1	5/19/2023 2:44:00 AM	BW968
Toluene	ND	1.0		µg/L	1	5/19/2023 2:44:00 AM	BW968
Ethylbenzene	ND	1.0		µg/L	1	5/19/2023 2:44:00 AM	BW968
Xylenes, Total	ND	2.0		µg/L	1	5/19/2023 2:44:00 AM	BW968
Surr: 4-Bromofluorobenzene	92.7	52.4-148		%Rec	1	5/19/2023 2:44:00 AM	BW968

Lab ID: 2305713-015

Collection Date: 5/9/2023 12:40:00 PM

Client Sample ID: PR-2

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: KMN
Benzene	2.9	2.0		µg/L	2	5/19/2023 3:06:00 AM	BW968
Toluene	ND	2.0		µg/L	2	5/19/2023 3:06:00 AM	BW968
Ethylbenzene	12	2.0		µg/L	2	5/19/2023 3:06:00 AM	BW968
Xylenes, Total	29	4.0		µg/L	2	5/19/2023 3:06:00 AM	BW968
Surr: 4-Bromofluorobenzene	106	52.4-148		%Rec	2	5/19/2023 3:06:00 AM	BW968

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		



## Analytical Report

Lab Order: 2305713

Date Reported: 5/26/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Lab Order: 2305713

Project: Sullivan GC D 1E

Lab ID: 2305713-016

Collection Date: 5/9/2023 2:30:00 PM

Client Sample ID: MW-13

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES							Analyst: KMN
Benzene	5.3	2.0		µg/L	2	5/19/2023 3:27:00 AM	BW968
Toluene	ND	2.0		µg/L	2	5/19/2023 3:27:00 AM	BW968
Ethylbenzene	17	2.0		µg/L	2	5/19/2023 3:27:00 AM	BW968
Xylenes, Total	47	4.0		µg/L	2	5/19/2023 3:27:00 AM	BW968
Surr: 4-Bromofluorobenzene	110	52.4-148		%Rec	2	5/19/2023 3:27:00 AM	BW968

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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

WO#: 2305713

26-May-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBW</b>	Batch ID: <b>B96798</b>	RunNo: <b>96798</b>								
Prep Date:	Analysis Date: <b>5/16/2023</b>	SeqNo: <b>3510619</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		93.7	52.4	148			

Sample ID: <b>2305713-001ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW03</b>	Batch ID: <b>B96798</b>	RunNo: <b>96798</b>								
Prep Date:	Analysis Date: <b>5/16/2023</b>	SeqNo: <b>3510738</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	88.1	70	130			
Toluene	18	1.0	20.00	0	89.2	70	130			
Ethylbenzene	18	1.0	20.00	0	89.5	70	130			
Xylenes, Total	54	2.0	60.00	0	89.4	70	130			
Surr: 4-Bromofluorobenzene	19		20.00		92.9	52.4	148			

Sample ID: <b>2305713-001amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW03</b>	Batch ID: <b>B96798</b>	RunNo: <b>96798</b>								
Prep Date:	Analysis Date: <b>5/16/2023</b>	SeqNo: <b>3510739</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	16	1.0	20.00	0	81.7	70	130	7.51	20	
Toluene	17	1.0	20.00	0	83.1	70	130	7.06	20	
Ethylbenzene	17	1.0	20.00	0	83.5	70	130	6.92	20	
Xylenes, Total	50	2.0	60.00	0	84.1	70	130	6.16	20	
Surr: 4-Bromofluorobenzene	19		20.00		93.2	52.4	148	0	0	

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSW</b>	Batch ID: <b>BW96808</b>	RunNo: <b>96808</b>								
Prep Date:	Analysis Date: <b>5/17/2023</b>	SeqNo: <b>3511254</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	86.2	70	130			
Toluene	18	1.0	20.00	0	87.5	70	130			
Ethylbenzene	17	1.0	20.00	0	87.4	70	130			
Xylenes, Total	53	2.0	60.00	0	87.5	70	130			
Surr: 4-Bromofluorobenzene	19		20.00		95.4	52.4	148			

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2305713

26-May-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBW</b>	Batch ID: <b>BW96808</b>	RunNo: <b>96808</b>								
Prep Date:	Analysis Date: <b>5/17/2023</b>	SeqNo: <b>3511255</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		92.7	52.4	148			

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSW</b>	Batch ID: <b>BW96812</b>	RunNo: <b>96812</b>								
Prep Date:	Analysis Date: <b>5/18/2023</b>	SeqNo: <b>3512856</b> Units: <b>%Rec</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	16		20.00		77.9	52.4	148			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBW</b>	Batch ID: <b>BW96812</b>	RunNo: <b>96812</b>								
Prep Date:	Analysis Date: <b>5/18/2023</b>	SeqNo: <b>3512857</b> Units: <b>%Rec</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	15		20.00		75.7	52.4	148			

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBW</b>	Batch ID: <b>BW96869</b>	RunNo: <b>96869</b>								
Prep Date:	Analysis Date: <b>5/18/2023</b>	SeqNo: <b>3513909</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	18		20.00		90.9	52.4	148			

Sample ID: <b>2305713-010ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW22</b>	Batch ID: <b>BW96869</b>	RunNo: <b>96869</b>								
Prep Date:	Analysis Date: <b>5/19/2023</b>	SeqNo: <b>3513964</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	92	5.0	100.0	5.593	86.7	70	130			
Toluene	89	5.0	100.0	0	89.3	70	130			
Ethylbenzene	90	5.0	100.0	0	90.1	70	130			
Xylenes, Total	280	10	300.0	10.58	89.1	70	130			

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

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

WO#: 2305713

26-May-23

**Client:** HILCORP ENERGY**Project:** Sullivan GC D 1E

Sample ID: <b>2305713-010ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW22</b>	Batch ID: <b>BW96869</b>	RunNo: <b>96869</b>								
Prep Date:	Analysis Date: <b>5/19/2023</b>	SeqNo: <b>3513964</b>	Units: <b>µg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	91		100.0		91.3	52.4	148			

Sample ID: <b>2305713-010amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW22</b>	Batch ID: <b>BW96869</b>	RunNo: <b>96869</b>								
Prep Date:	Analysis Date: <b>5/19/2023</b>	SeqNo: <b>3513965</b>	Units: <b>µg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	87	5.0	100.0	5.593	81.5	70	130	5.79	20	
Toluene	84	5.0	100.0	0	84.4	70	130	5.72	20	
Ethylbenzene	86	5.0	100.0	0	85.7	70	130	5.06	20	
Xylenes, Total	260	10	300.0	10.58	84.8	70	130	4.78	20	
Surr: 4-Bromofluorobenzene	89		100.0		89.3	52.4	148	0	0	

Sample ID: <b>mb</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBW</b>	Batch ID: <b>BW96924</b>	RunNo: <b>96924</b>								
Prep Date:	Analysis Date: <b>5/22/2023</b>	SeqNo: <b>3516335</b>	Units: <b>µg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	18		20.00		91.7	52.4	148			

Sample ID: <b>100ng btex lcs</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSW</b>	Batch ID: <b>BW96924</b>	RunNo: <b>96924</b>								
Prep Date:	Analysis Date: <b>5/22/2023</b>	SeqNo: <b>3516336</b>	Units: <b>µg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	90.3	70	130			
Toluene	18	1.0	20.00	0	91.4	70	130			
Ethylbenzene	18	1.0	20.00	0	91.5	70	130			
Xylenes, Total	55	2.0	60.00	0	91.7	70	130			
Surr: 4-Bromofluorobenzene	19		20.00		97.0	52.4	148			

Sample ID: <b>2305713-006ams</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>MW15</b>	Batch ID: <b>BW96924</b>	RunNo: <b>96924</b>								
Prep Date:	Analysis Date: <b>5/22/2023</b>	SeqNo: <b>3517057</b>	Units: <b>µg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2305713

26-May-23

Client: HILCORP ENERGY

Project: Sullivan GC D 1E

Sample ID: 2305713-006ams		SampType: MS			TestCode: EPA Method 8021B: Volatiles					
Client ID: MW15		Batch ID: BW96924			RunNo: 96924					
Prep Date:		Analysis Date: 5/22/2023			SeqNo: 3517057		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	91	5.0	100.0	1.957	89.4	70	130			
Toluene	99	5.0	100.0	8.123	90.9	70	130			
Ethylbenzene	300	5.0	100.0	207.7	87.4	70	130			
Xylenes, Total	1100	10	300.0	846.2	84.1	70	130			
Surr: 4-Bromofluorobenzene	170		100.0		173	52.4	148			S

Sample ID: 2305713-006amsd		SampType: MSD		TestCode: EPA Method 8021B: Volatiles						
Client ID: MW15		Batch ID: BW96924			RunNo: 96924					
Prep Date:		Analysis Date: 5/22/2023			SeqNo: 3517058		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	85	5.0	100.0	1.957	83.3	70	130	6.88	20	
Toluene	91	5.0	100.0	8.123	83.3	70	130	7.97	20	
Ethylbenzene	270	5.0	100.0	207.7	66.6	70	130	7.30	20	S
Xylenes, Total	1000	10	300.0	846.2	60.2	70	130	6.75	20	S
Surr: 4-Bromofluorobenzene	140		100.0		138	52.4	148	0	0	

### Qualifiers:

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank  
E Above Quantitation Range/Estimated Value  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit





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

## Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2305713

RcptNo: 1

Received By: Juan Rojas

5/12/2023 7:30:00 AM

*Juan Rojas*

Completed By: Michelle Garcia

5/12/2023 11:26:19 AM

*Michelle Garcia*

Reviewed By:

*WJ 5/12/23 @ 15:10*

### Chain of Custody

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

### Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐

# of preserved  
bottles checked  
for pH:

(<2 or >12 unless noted)

Adjusted? \_\_\_\_\_

Checked by: *WJ 5/12/23*

### Special Handling (if applicable)

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

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

16. Additional remarks:

### 17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.5	Good	Yes	Morty		



## Chain-of-Custody Record

Client: Hilcorp Energy Company  
Attn: Kate Kaufman  
Mailing Address:

Phone #: 907-244-8292  
email or Fax#: Kkavfman@chicorp.com

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

Accreditation: ☐ Az Compliance  
☐ NELAC ☐ Other \_\_\_\_\_  
☐ EDD (Type) \_\_\_\_\_

Date	Time	Matrix	Sample Name
5/11	13:10	AQ	MW 27
5/11	13:40	J	MW 28
5/9	12:40	↓	BPR-2
5/9	14:30	AQ	MW-13

[illegible]

date:	Time:	Relinquished by:	F
5/11	15:30	Al Thomson	
date:	Time:	Relinquished by:	F
5/11/0	1804	<i>[Signature]</i>	

If necessary, samples submitted to Hall Environmental may be subcon

*Released to Imaging: 7/30/2024 12:53:17 PM*

Turn-Around Time: ☒ Standard ☐ Rush

Project Name: Sullivan GC D #1E

Project #:

Project Manager: Stuart Hyde  
Shyde@ensolum.com

Sampler:	Al Thomson + Eric Carroll
On Ice:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

# of Coolers: 1

Cooler Temp (including CF):  $3.4 + 0.1 = 3.5^{\circ}\text{C}$

Container Type and #	Preservative Type	HEAL No. 2305713
-------------------------	----------------------	---------------------

$3 \times V_{O_A}$	HCl	-013
$\downarrow$	$\uparrow$	-014
		-015
$3 \times V_{O_A}$	HCl	-016

[illegible]

Received by:	Via:	Date	Time
<i>[Signature]</i>	<i>[Signature]</i>	5/11/23	1530
Received by:	Via:	Date	Time

attracted to other accredited laboratories. This serves as notice of this po



## HALL ENVIRONMENTAL ANALYSIS LABORATORY

[www.hallenvironmental.com](http://www.hallenvironmental.com)

4901 Hawkins NE - Albuquerque, NM 87109

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

## Analysis Request

	X	BTEX, MTBE / TMB's (8021)
		TPH:8015D(GRO / DRO / MRO)
		8081 Pesticides/8082 PCB's
		EDB (Method 504.1)
		PAHs by 8310 or 8270SIMS
		RCRA 8 Metals
		Cl, F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub>
		8260 (VOA)
		8270 (Semi-VOA)
		Total Coliform (Present/Absent)

Remarks:

CC: a.thomson@eurolom.com

**District I**  
1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720  
**District II**  
811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720  
**District III**  
1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170  
**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS  
  
Action 271138

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 271138
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. nv-07/30/2024.	7/30/2024