

NV



October 12, 2022

New Mexico Oil Conservation Division

New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Third Quarter 2022 – Solar SVE System Update

Scott 4M
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NCE2003650476
Ensolum Project No. 07A1988016

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Third Quarter 2022 – Solar SVE System Update* report summarizing the solar soil vapor extraction (SVE) system performance at the Scott 4M natural gas production well (Site), located in Section 17, Township 31 North, and Range 10 West in San Juan County (Figure 1). The SVE system has operated since January 2021 to remediate subsurface soil impacts resulting from approximately 42 barrels (bbls) of natural gas condensate released from an aboveground storage tank. This report summarizes Site activities performed in July, August, and September of 2022.

SVE SYSTEM SPECIFICATIONS

During the third quarter of 2022, a solar SVE system operated at the Site consisting of a 1/3 horsepower Atlantic Blower AB-91 blower capable of producing a flow of 22 standard cubic feet per minute (scfm) and a vacuum of 29 inches of water column (IWC). Three solar panels, with a total of 915 watts of maximum power output, charge four 12-volt deep cycle batteries that subsequently power the SVE blower. The system operation is controlled by a timer adjusted throughout the year run based on available nominal daylight hours (generally 8 hours per day during the winter and 12 hours per day during the summer).

Seven SVE wells are currently present at the Site (SVE01 through SVE07, shown on Figure 2). SVE wells SVE01 through SVE03 are screened at depth intervals ranging from 25 feet to 45 feet below ground surface (bgs) in order to remediate deep soil impacts located at the Site. SVE wells SVE04 through SVE 07 are screened at depth intervals ranging from 5 feet to 25 feet bgs in order to remediate shallow soil impacts at the Site.

THIRD QUARTER 2022 ACTIVITIES

During the third quarter of 2022, Ensolum and Hilcorp personnel performed bi-weekly operation and maintenance (O&M) visits to ensure the system was operating as designed and to perform any required

maintenance. During Site visits, the system timer and the angle of the solar panels were adjusted to account for seasonal variations and maximize system efficiency. Field notes taken during O&M visits are presented in Appendix A.

During the third quarter of 2022, SVE wells SVE01 (deep well) and SVE05 (shallow well) were operated in order to induce flow in both the shallow and deep impacts zones. Between June 16 and September 19, 2022 (the last day of the solar SVE system operation), there were an estimated 1,095 total hours of available nominal daylight during which time the solar SVE system could operate. Site specific nominal daylight hours were presented in the approved *Update Report and Updated Remediation Workplan* prepared by WSP, Inc. (WSP), dated October 6, 2021, and were based on the Site location and estimates by the National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS). Between these dates, the actual runtime for the system was 1,252.1 hours, equating to a third quarter 2022 runtime efficiency of 114.3 percent (%). For solar SVE systems, runtime efficiency can be greater than 100 % when the solar panels charge the system's batteries during daylight hours and continue to run the SVE blower for a longer amount of time than the nominal daylight hours available at the Site. Appendix B presents photographs of the runtime meter for calculating the third quarter runtime efficiency. Table 1 presents the SVE system runtime compared to nominal available daylight hours per month.

A third quarter 2022 air sample was collected on September 28, 2022 from a sample port located between the SVE piping manifold and the SVE blower using a high vacuum air sampler. Of note, an air sample for the third quarter was originally collected on September 9, 2022; however, due to a laboratory issue with the original sample, a subsequent sample was recollected on September 28, 2022 to be used for the third quarter 2022 sample for the system. Flow measurements and runtime hours collected on September 9, 2022 from the solar SVE system were used for emissions calculations.

Prior to collection, the emission sample was field screened with a photoionization detector (PID) for organic vapor monitoring (OVM). The emission sample was collected directly into two 1-Liter Tedlar® bags and submitted to Hall Environmental Analysis Laboratory (Hall) in Albuquerque, New Mexico for analysis of total volatile petroleum hydrocarbons (TVPH – also known as total petroleum hydrocarbons – gasoline range organics (TPH-GRO)) following United States Environmental Protection Agency (EPA) Method 8015D, volatile organic compounds (VOCs) following EPA Method 8260B, and fixed gas analysis of oxygen and carbon dioxide following Gas Processors Association (GPA) Method 2261. Table 2 presents a summary of analytical data collected during this sampling event and historical sampling events, with the full laboratory analytical report included in Appendix C.

Air sample data and measured stack flow rates are used to estimate total mass recovered and total emissions generated by the SVE system (Table 3). Based on these estimates, 5,451 pounds (2.7 tons) of TVPH have been removed by the system to date.

UPDATED SVE SYSTEM INSTALLATION

Hilcorp has completed the construction of an upgraded SVE system for the Site, as specified in *Updated Pilot Testing Report* submitted by WSP to the New Mexico Oil Conservation Division (NMOCD) on December 15, 2021. Specifically, the new SVE system consists of a 3-phase, 3.4 horsepower Republic Model KVHRC500 blower capable of producing a flow of 221 scfm and a vacuum of 76 IWC. Farmington Electric Utility System (FEUS) finalized the installation of a permanent power drop and electrical service to the Site on September 16, 2022 and the new system was connected on September 19, 2022. A new manifold was constructed and installed at the Site on September 28, 2022 in order to operate all wells simultaneously.

RECOMMENDATIONS

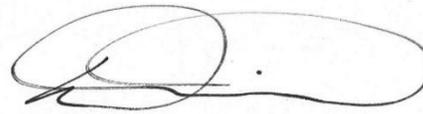
Bi-weekly O&M visits will continue to be performed by Ensolum and/or Hilcorp personnel to ensure that the SVE system is operating within normal working ranges (i.e., temperature, pressure, and vacuum). Deviations from regular operations will be noted on field logs and included in the following quarterly report. Additionally, The fourth quarter report will document the runtime and performance of the new SVE system beginning on September 19, 2022 when the new SVE system was installed at the Site.

We appreciate the opportunity to provide this report to the NMOCD. If you should have any questions or comments regarding this report, please contact the undersigned.

Sincerely,
Ensolum, LLC



Stuart Hyde, LG
Senior Geologist
(970) 903-1607
shyde@ensolum.com



Daniel R. Moir, PG
Senior Managing Geologist
(303) 887-2946
dmoir@ensolum.com

Attachments:

- Figure 1 Site Location
- Figure 2 SVE System Configuration

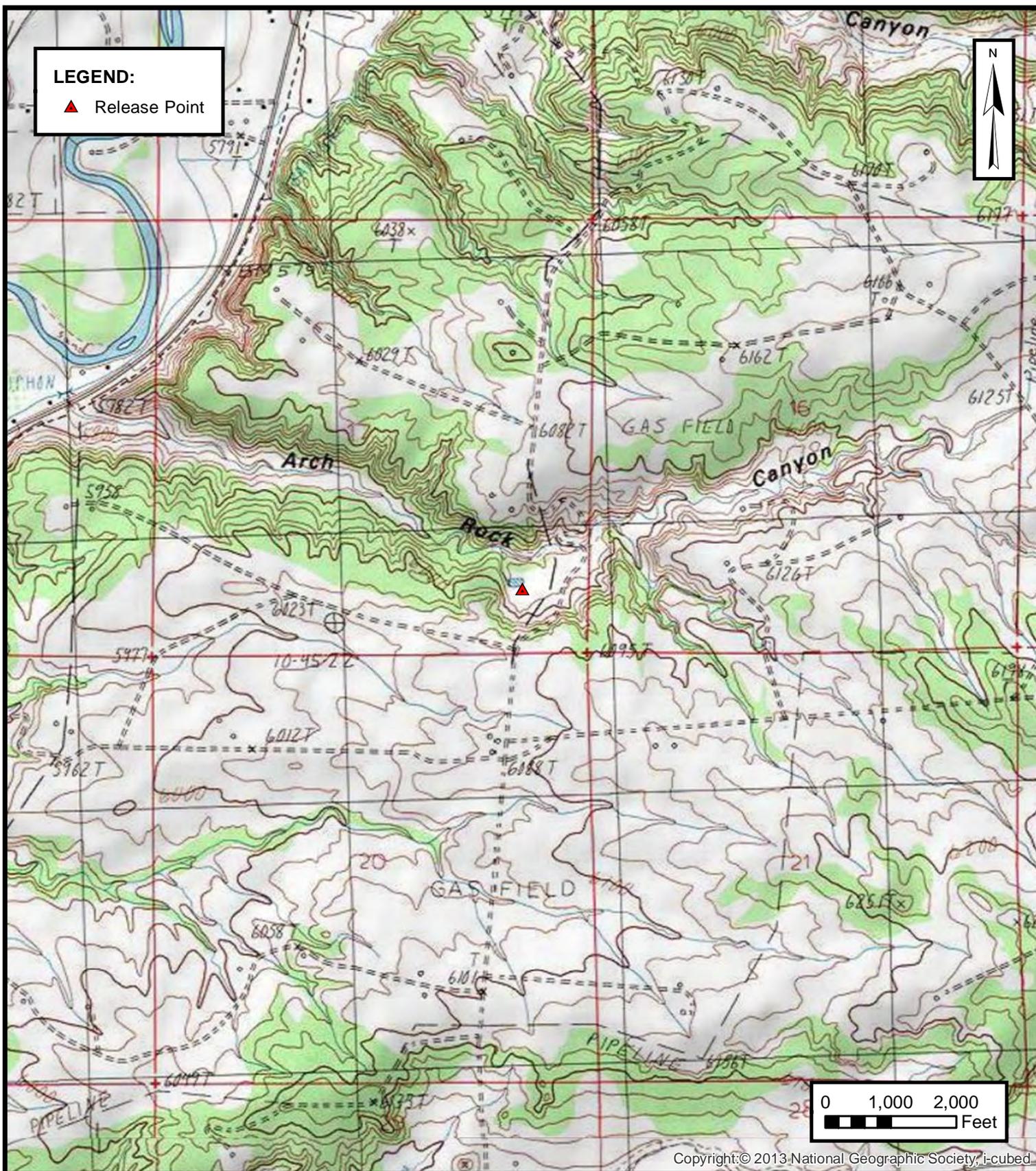
- Table 1 Soil Vapor Extraction System Runtime Calculations
- Table 2 Soil Vapor Extraction System Air Analytical Results
- Table 3 Soil Vapor Extraction System Mass Removal and Emissions

- Appendix A Field Notes
- Appendix B Project Photographs
- Appendix C Laboratory Analytical Reports





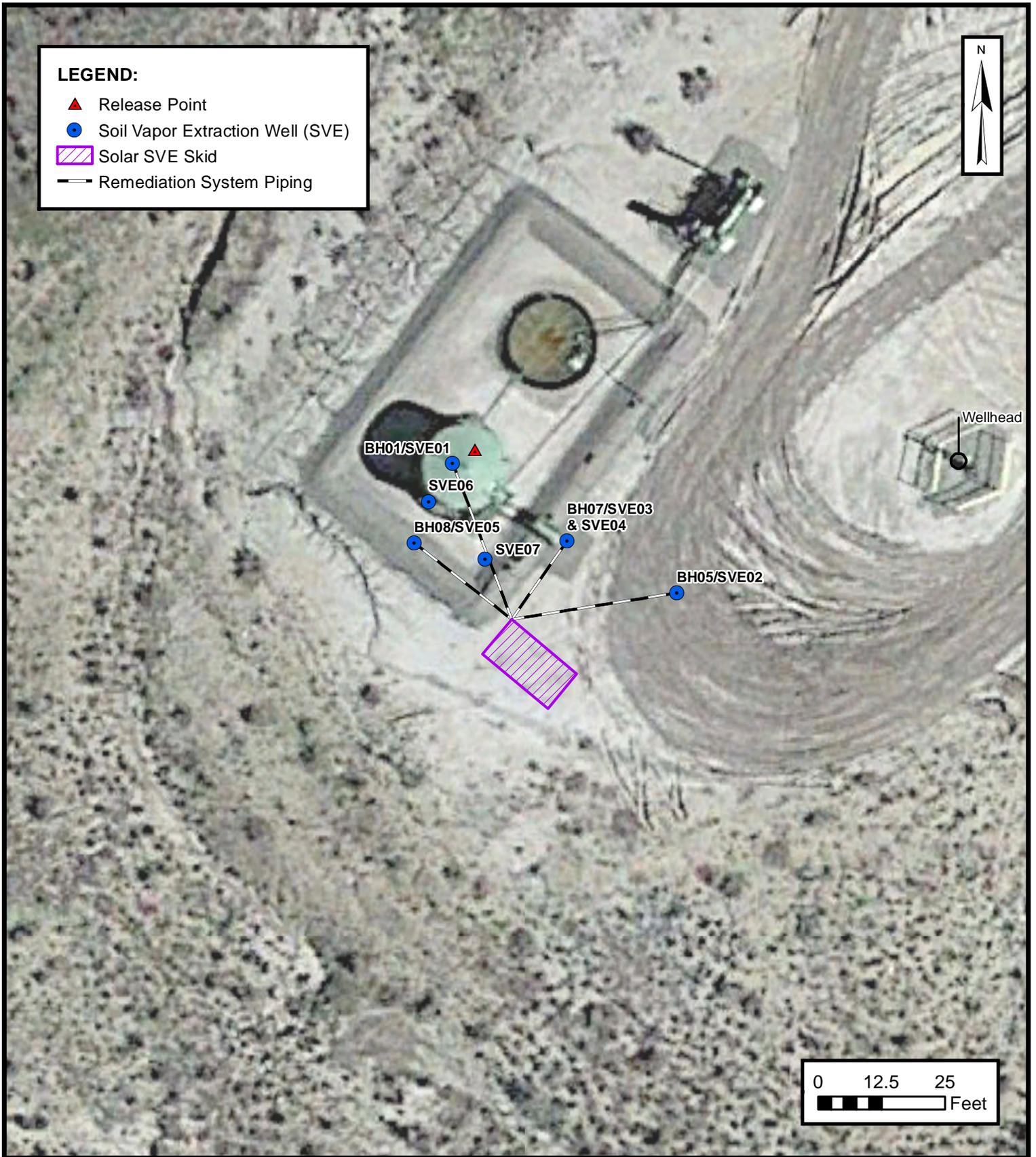
FIGURES



ENSOLUM
 Environmental & Hydrogeologic Consultants

SITE LOCATION
 HILCORP ENERGY COMPANY
 SCOTT 4M
 SESE SEC 17 T31N R10W, San Juan County, New Mexico
 36.893345° N, 107.899185° W
 PROJECT NUMBER: 07A1988016

FIGURE
1



SVE SYSTEM CONFIGURATION

HILCORP ENERGY COMPANY
SCOTT 4M
SESE SEC 17 T31N R10W, San Juan County, New Mexico
36.893345° N, 107.899185° W

PROJECT NUMBER: 07A1988016

FIGURE

2



TABLES



TABLE 1
SOIL VAPOR EXTRACTION SYSTEM RUNTIME CALCULATIONS
 Hilcorp Energy Company - Scott 4M
 San Juan County, New Mexico

 Ensolum Project No. 07A1988016

Date	Total Operational Hours	Delta Hours
6/17/2022	4,909.9	---
9/19/2022	6,162.0	1,252.1

Time Period	June 16 to June 30, 2022	July 1 to July 21, 2022	August 1 to August 21, 2022	September 1 to September 19, 2022
Days	16	31	31	19
Avg. Nominal Daylight Hours	12	12	11	10
Available Runtime Hours	192	372	341	190

Quarterly Available Daylight Runtime Hours **1,095**
Quarterly Runtime Hours **1,252.1**
Quarterly % Runtime **114.3%**

Month	Days	Nominal Daylight Hours	Total Month Hours
January	31	8	248
February	28	8	224
March	31	9	279
April	30	10	300
May	31	11	341
June	30	12	360
July	31	12	372
August	31	11	341
September	30	10	300
October	31	10	310
November	30	9	270
December	31	8	248



TABLE 2
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS
 Hilcorp Energy Company - Scott 4M
 San Juan County, New Mexico

Ensolum Project No. 07A1988016

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)	Oxygen (%)	Carbon Dioxide (%)
2/1/2021	118	85	240	10	64	18,000	--	--
9/7/2021	53	40	280	24	240	15,000	--	--
9/29/2021	316	210	1,800	240	2,200	85,000	--	--
12/2/2021	232	48	320	32	310	50,000	16.6%	1.03%
3/15/2022	402	38	430	63	660	18,000	20.8%	0.473%
6/16/2022	89	1.3	13	1.6	17	750	21.6%	0.15%
9/28/2022	476	9.6	120	19	220	5,900	20.7%	0.90%

Notes:

GRO: gasoline range organics

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

%: percent

--: not sampled



TABLE 3
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS
 Hilcorp Energy Company - Scott 4M
 San Juan County, New Mexico
 Ensolum Project No. 07A1988016

Flow and Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
2/1/2021	118	85	240	10	64	18,000
9/7/2021	53	40	280	24	240	15,000
9/29/2021	316	210	1,800	240	2,200	85,000
12/2/2021	232	48	320	32	310	50,000
3/15/2022	402	38	430	63	660	18,000
6/16/2022	89	1.3	13	1.6	17	750
9/28/2022 (1)	476	9.6	120	19	220	5,900
Average	241	62	458	56	530	27,521

Vapor Extraction Summary

Date	Flow Rate (cfm)	Total System Flow (cf)	Delta Flow (cf)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Total Xylenes (lb/hr)	TVPH (lb/hr)
2/1/2021	22	1,980	1,980	0.0070	0.020	0.00082	0.0053	1.5
9/7/2021	22	2,841,168	2,839,188	0.0051	0.021	0.0014	0.013	1.4
9/29/2021	10	2,979,528	138,360	0.0047	0.039	0.0049	0.046	1.9
12/2/2021	3.5	3,106,158	126,630	0.0017	0.014	0.0018	0.016	0.88
3/15/2022	8.0	3,519,486	413,328	0.0013	0.011	0.0014	0.015	1.0
6/16/2022	14	4,412,322	892,836	0.0010	0.012	0.0017	0.018	0.49
9/9/2022 (1)	12	5,218,146	805,824	0.0002	0.0030	0.0005	0.0053	0.15
Average				0.0030	0.017	0.0018	0.017	1.0

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
2/1/2021	1.5	1.5	0.010	0.030	0.0012	0.0079	2.2	0.0011
9/7/2021	2,152	2,151	11	46	3.0	27	2,920	1.5
9/29/2021	2,383	231	1.1	9.0	1.1	11	431	0.22
12/2/2021	2,986	603	1.0	8.4	1.1	9.9	533	0.27
3/15/2022	3,847	861	1.1	9.7	1.2	12	876	0.44
6/16/2022	4,910	1,063	1.1	12.3	1.8	19	522	0.26
9/9/2022 (1)	6,029	1,119	0.3	3.3	0.5	6	167	0.08
Total Mass Recovery to Date			16	89	8.8	85	5,451	2.7

Notes:

(1): SVE system hours and flow rates were collected during operation and maintenance visit on 9/9/2022

cf: cubic feet

cfm: cubic feet per minute

µg/L: micrograms per liter

lb/hr: pounds per hour

--: not sampled

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons



APPENDIX A

Field Notes

Location SCOTT Date 7-1-22

Project / Client Hi/Corp

13:00 EC on site for O&M
System on & Running
wells 1 & 5 active

HOWS @ 13:15 = 5092.4

VOC = 27 IWC
FLOW = 7.5 SRFM
PID = 363 ppm

Timer Set 6:30 - 20:00

open dilution to lower voc to
20 IWC

SCOTT 4M SVE SYSTEM BIWEEKLY O&M FORM

DATE: 7-22
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: KO TANK HIGH LEVEL

SVE SYSTEM		READING	TIME	TIMER SETTINGS	
Blower Hours (take photo)		5372.7	1230	Month	Timer Setting
Voltage In				January	8 AM to 7 PM
Amperage In				February	8 AM to 7 PM
Voltage Out				March	8 AM to 8 PM
Amperage Out				April	8 AM to 9 PM
KiloWatts				May	7 AM to 9 PM
KiloWatt-Hours				June	6 AM to 9 PM
Solar Controller Status				July	6 AM to 9 PM
Pre K/O Vacuum (IWC)		18		August	7 AM to 9 PM
Inlet Rotameter Flow (scfm)		11.5		September	8 AM to 9 PM
Inlet PID		196.4		October	8 AM to 8 PM
Exhaust PID		258.3		November	9 AM to 8 PM
Solar Panel Angle				December	8 AM to 6 PM
K/O Tank Drum Level					
K/O Liquid Drained (gallons)					
Timer Setting					

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
 Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)
 OPERATING WELLS: _____

Change in Well Operation: _____

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01	86.17			
SVE02				
SVE03				
SVE04				
SVE05	396.3			
SVE06 (OBSERVATION WELL)	 	 	 	
SVE07 (OBSERVATION WELL)	 	 	 	

COMMENTS/OTHER MAINTENANCE:

SCOTT 4M SVE SYSTEM BIWEEKLY O&M FORM

DATE: 8-3-22
 TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
 TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: KO TANK HIGH LEVEL

SVE SYSTEM	READING	TIME	TIMER SETTINGS	
Blower Hours (take photo)	5534.6		Month	Timer Setting
Voltage In			January	8 AM to 7 PM
Amperage In			February	8 AM to 7 PM
Voltage Out			March	8 AM to 8 PM
Amperage Out			April	8 AM to 9 PM
KiloWatts			May	7 AM to 9 PM
KiloWatt-Hours			June	6 AM to 9 PM
Solar Controller Status			July	6 AM to 9 PM
Pre K/O Vacuum (IWC)	16		August	7 AM to 9 PM
Inlet Rotameter Flow (scfm)	11.5		September	8 AM to 9 PM
Inlet PID	282		October	8 AM to 8 PM
Exhaust PID	279		November	9 AM to 8 PM
Solar Panel Angle			December	8 AM to 6 PM
K/O Tank Drum Level				
K/O Liquid Drained (gallons)				
Timer Setting				

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
 Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)

OPERATING WELLS

Change in Well Operation:

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01	129			
SVE02				
SVE03				
SVE04				
SVE05	530			
SVE06 (OBSERVATION WELL)	 	 	 	
SVE07 (OBSERVATION WELL)	 	 	 	

COMMENTS/OTHER MAINTENANCE:

SCOTT 4M SVE SYSTEM BIWEEKLY O&M FORM

DATE: 9-9-22
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL _____

SVE SYSTEM		READING	TIME	TIMER SETTINGS	
Blower Hours (take photo)		6029.2	1306	Month	Timer Setting
Voltage In				January	8 AM to 7 PM
Amperage In				February	8 AM to 7 PM
Voltage Out				March	8 AM to 8 PM
Amperage Out				April	8 AM to 9 PM
KiloWatts				May	7 AM to 9 PM
KiloWatt-Hours				June	6 AM to 9 PM
Solar Controller Status				July	6 AM to 9 PM
Pre K/O Vacuum (IWC)		15		August	7 AM to 9 PM
Inlet Rotameter Flow (scfm)		12		September	8 AM to 9 PM
Inlet PID		333		October	8 AM to 8 PM
Exhaust PID		385		November	9 AM to 8 PM
Solar Panel Angle				December	8 AM to 6 PM
K/O Tank Drum Level					
K/O Liquid Drained (gallons)					
Timer Setting					

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____
 Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)
 OPERATING WELLS _____

Change in Well Operation: _____

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01	118			
SVE02				
SVE03				
SVE04				
SVE05	508			
SVE06 (OBSERVATION WELL)	 	 	 	
SVE07 (OBSERVATION WELL)	 	 	 	

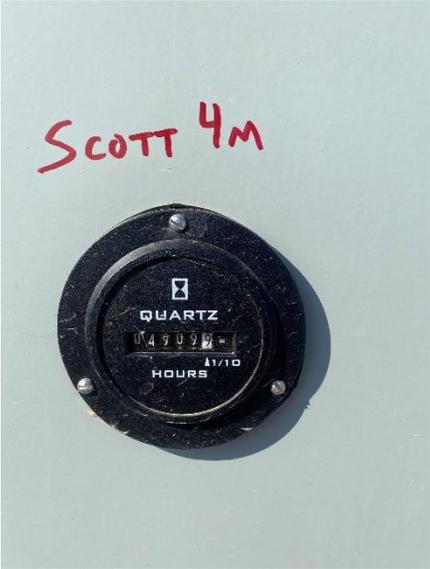
COMMENTS/OTHER MAINTENANCE:



APPENDIX B

Project Photographs

PROJECT PHOTOGRAPHS
Scott 4M
San Juan County, New Mexico
Hilcorp Energy Company

<p>Photograph 1</p> <p>Runtime meter taken on June 16, 2022 at 9:00 AM Hours = 4,909.4</p>	
<p>Photograph 2</p> <p>Runtime meter taken on September 19, 2022 at 12:45 PM when the SVE system was switched from solar to permanent power Hours = 6162.0</p>	



APPENDIX C

Laboratory Analytical Reports



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

October 06, 2022

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

RE: Scott 4M

OrderNo.: 2209H04

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/30/2022 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 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 in a cursive style.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order **2209H04**

Date Reported: **10/6/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Influent All Wells 092822

Project: Scott 4M

Collection Date: 9/28/2022 2:20:00 PM

Lab ID: 2209H04-001

Matrix: AIR

Received Date: 9/30/2022 6:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	9.6	5.0		µg/L	50	9/30/2022 1:24:00 PM
Toluene	120	5.0		µg/L	50	9/30/2022 1:24:00 PM
Ethylbenzene	19	5.0		µg/L	50	9/30/2022 1:24:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2,4-Trimethylbenzene	22	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,3,5-Trimethylbenzene	19	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Naphthalene	ND	10		µg/L	50	9/30/2022 1:24:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	9/30/2022 1:24:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	9/30/2022 1:24:00 PM
Acetone	ND	50		µg/L	50	9/30/2022 1:24:00 PM
Bromobenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Bromoform	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Bromomethane	ND	10		µg/L	50	9/30/2022 1:24:00 PM
2-Butanone	ND	50		µg/L	50	9/30/2022 1:24:00 PM
Carbon disulfide	ND	50		µg/L	50	9/30/2022 1:24:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Chlorobenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Chloroethane	ND	10		µg/L	50	9/30/2022 1:24:00 PM
Chloroform	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Chloromethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	9/30/2022 1:24:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Dibromomethane	ND	10		µg/L	50	9/30/2022 1:24:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2-Dichloropropane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- 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

Analytical Report

Lab Order 2209H04

Date Reported: 10/6/2022

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Influent All Wells 092822

Project: Scott 4M

Collection Date: 9/28/2022 2:20:00 PM

Lab ID: 2209H04-001

Matrix: AIR

Received Date: 9/30/2022 6:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
2-Hexanone	ND	50		µg/L	50	9/30/2022 1:24:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	9/30/2022 1:24:00 PM
Methylene chloride	ND	15		µg/L	50	9/30/2022 1:24:00 PM
n-Butylbenzene	ND	15		µg/L	50	9/30/2022 1:24:00 PM
n-Propylbenzene	5.2	5.0		µg/L	50	9/30/2022 1:24:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Styrene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	9/30/2022 1:24:00 PM
Vinyl chloride	ND	5.0		µg/L	50	9/30/2022 1:24:00 PM
Xylenes, Total	220	7.5		µg/L	50	9/30/2022 1:24:00 PM
Surr: Dibromofluoromethane	101	70-130		%Rec	50	9/30/2022 1:24:00 PM
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	50	9/30/2022 1:24:00 PM
Surr: Toluene-d8	107	70-130		%Rec	50	9/30/2022 1:24:00 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	50	9/30/2022 1:24:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	5900	250		µg/L	50	9/30/2022 1:24:00 PM
Surr: BFB	92.6	70-130		%Rec	50	9/30/2022 1:24:00 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		



ANALYTICAL SUMMARY REPORT

October 06, 2022

Hall Environmental

4901 Hawkins St NE Ste D
Albuquerque, NM 87109-4372

Work Order: B22100211 Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 10/4/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22100211-001	2209H04-001B, Influent All Wells 092822	09/28/22 14:20	10/04/22	Air	Air Correction Calculations Appearance and Comments Calculated Properties GPM @ std cond./1000 cu. ft., moist. Free Natural Gas Analysis Specific Gravity @ 60/60

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:



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Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B22100211-001
Client Sample ID: 2209H04-001B, Influent All Wells 092822

Report Date: 10/06/22
Collection Date: 09/28/22 14:20
Date Received: 10/04/22
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	20.73	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Nitrogen	77.50	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Carbon Dioxide	0.90	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Methane	0.79	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Ethane	0.06	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Propane	0.02	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Hexanes plus	<0.01	Mol %		0.01		GPA 2261-95	10/05/22 12:34 / jrj
Propane	0.006	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj
Hexanes plus	< 0.001	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj
GPM Total	0.006	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj
GPM Pentanes plus	< 0.001	gpm		0.001		GPA 2261-95	10/05/22 12:34 / jrj

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	10			1		GPA 2261-95	10/05/22 12:34 / jrj
Net BTU per cu ft @ std cond. (LHV)	9			1		GPA 2261-95	10/05/22 12:34 / jrj
Pseudo-critical Pressure, psia	549			1		GPA 2261-95	10/05/22 12:34 / jrj
Pseudo-critical Temperature, deg R	242			1		GPA 2261-95	10/05/22 12:34 / jrj
Specific Gravity @ 60/60F	0.998			0.001		D3588-81	10/05/22 12:34 / jrj
Air, %	94.71			0.01		GPA 2261-95	10/05/22 12:34 / jrj
- The analysis was not corrected for air.							

COMMENTS

-
- BTU, GPM, and specific gravity are corrected for deviation from ideal gas behavior.
- GPM = gallons of liquid at standard conditions per 1000 cu. ft. of moisture free gas @ standard conditions.
- To convert BTU to a water-saturated basis @ standard conditions, multiply by 0.9825.
- Standard conditions: 60 F & 14.73 psi on a dry basis.

Report Definitions: RL - Analyte Reporting Limit
QCL - Quality Control Limit

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Work Order: B22100211

Report Date: 10/06/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95										
Batch: R389175										
Lab ID: B22100100-001ADUP	11	Sample Duplicate								
										Run: GCNGA-B_221005A 10/05/22 10:16
Nitrogen		4.92	Mol %	0.01				4.6	20	
Carbon Dioxide		0.16	Mol %	0.01				6.5	20	
Hydrogen Sulfide		<0.01	Mol %	0.01					20	
Methane		94.6	Mol %	0.01				0.2	20	
Ethane		0.26	Mol %	0.01				0.0	20	
Propane		0.03	Mol %	0.01				0.0	20	
Isobutane		<0.01	Mol %	0.01					20	
n-Butane		<0.01	Mol %	0.01					20	
Isopentane		<0.01	Mol %	0.01					20	
n-Pentane		<0.01	Mol %	0.01					20	
Hexanes plus		<0.01	Mol %	0.01					20	
Lab ID: LCS100522										
	11	Laboratory Control Sample								Run: GCNGA-B_221005A 10/05/22 15:20
Oxygen		0.58	Mol %	0.01	116	70	130			
Nitrogen		6.01	Mol %	0.01	100	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.5	Mol %	0.01	100	70	130			
Ethane		6.06	Mol %	0.01	101	70	130			
Propane		5.07	Mol %	0.01	103	70	130			
Isobutane		2.00	Mol %	0.01	100	70	130			
n-Butane		1.99	Mol %	0.01	99	70	130			
Isopentane		1.01	Mol %	0.01	101	70	130			
n-Pentane		1.01	Mol %	0.01	101	70	130			
Hexanes plus		0.76	Mol %	0.01	95	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Work Order Receipt Checklist

Hall Environmental

B22100211

Login completed by: Leslie S. Cadreau

Date Received: 10/4/2022

Reviewed by: darcy

Received by: jdr

Reviewed Date: 10/4/2022

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on all shipping container(s)/cooler(s)? Yes No Not Present
- Custody seals intact on all sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time?
(Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.) Yes No
- Temp Blank received in all shipping container(s)/cooler(s)? Yes No Not Applicable
- Container/Temp Blank temperature: 16.7°C No Ice
- Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4"). Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No Not Applicable

Standard Reporting Procedures:

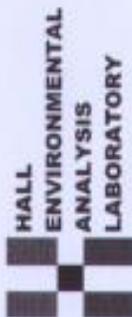
Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None



CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Hall Environmental Analysis Laboratory
 4901 Hankins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975
 FAX: 505-343-4107
 Website: www.hallenvironmental.com

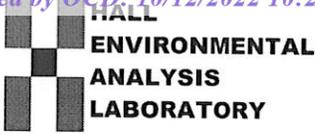
SUB CONTRACTOR: Energy Labs - Billings		COMPANY: Energy Laboratories	PHONE: (406) 869-6253	FAX: (406) 252-6069			
ADDRESS: 1120 South 27th Street			ACCOUNT #:	EMAIL:			
CITY, STATE, ZIP: Billings, MT 59107							
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2209H04-001B	Influent All Wells 092822	TEDLAR	Air	5/28/2022 2:20:00 PM	1	

RUSH 5 DAY TAT* 522100211

SPECIAL INSTRUCTIONS/COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By: <u>SK</u>	Date: 9/06/2022	Time: 8:21 AM	Received By: <u>JULIE B. HANSON</u>	Date: 7/14/22	Time: 0930
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
TAT: Standard <input type="checkbox"/>	RUSH		Mean Std <input type="checkbox"/>	2nd Std <input type="checkbox"/>	3rd Std <input type="checkbox"/>
REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARD COPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE			Temp of samples _____ °C Attempt to Cool? _____ Comments: _____		



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: 2209H04 RcptNo: 1

Received By: Juan Rojas 9/30/2022 6:55:00 AM

Juan Rojas

Completed By: Sean Livingston 9/30/2022 8:14:43 AM

Sean Livingston

Reviewed By: *KPC* *9-30-22*

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° 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? 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.)

IO
of preserved bottles checked for pH: 9/30/22
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

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

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

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.5	Good				

Chain-of-Custody Record

Client: Hilcorp Energy CO
 Attn: Mitch Killough
 Mailing Address: _____

Phone #: _____
 email or Fax#: _____

QA/QC Package: Level 4 (Full Validation)
 Standard Az Compliance
 Accreditation: NELAC Other
 EDD (Type) _____

Turn-Around Time: 5 DAY
 Standard Rush
 Project Name: Scott 4M
 Project #: _____

Project Manager: Stuart Hyde
 Sampler: D. Burns
 On Ice: Yes No
 # of Coolers: 1
 Cooler Temp (including CF): 0.5-0.25 (°C)

Container Type and #: 2-Tedlar
 Preservative Type: NA
 HEAL No.: 2209H04
001

Date: 9-28 Time: 1400 Matrix: Air Sample Name: Influent All Wells
092822
 Relinquished by: [Signature] Date: 9-29-22 Time: 1545
 Relinquished by: [Signature] Date: 9/29/22 Time: 1607

Analysis Request

BTEX / MTBE / TMB's (8021)	<input checked="" type="checkbox"/>
TPH:8015D(GRO / DRO / MRO)	<input checked="" type="checkbox"/>
8081 Pesticides/8082 PCB's	
EDB (Method 504.1)	
PAHs by 8310 or 8270SIMS	
RCRA 8 Metals	
Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	
8260 (VOA) <u>Full List</u>	<input checked="" type="checkbox"/>
8270 (Semi-VOA)	
Total Coliform (Present/Absent)	<input checked="" type="checkbox"/>
<u>Fixed Gas CO2+H2</u>	

Remarks:

cc: dhencmann ensidum.com
shyde
downs

Received by: [Signature] Date: 9/29/22 Time: 1545
 Received by: [Signature] Date: 9/29/22 Time: 1407

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.

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 150392

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 150392
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See app ID 176024 for most updated status.	2/6/2023