



April 11, 2023

New Mexico Oil Conservation Division

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

Re: First Quarter 2023 – SVE System Update

Sullivan GC D #1E
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NCS1518952648

1. Follow the recommendations provided.
2. OCD will require quarterly report for 2023. Next report due no later than July 31, 2023.
3. Since the system was re-started in December 2021, OCD will accept bi-annual (twice a year) reporting initiating in 2024.

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *First Quarter 2023 – SVE System Update* report summarizing the soil vapor extraction (SVE) system performance at the Sullivan GC D #1E natural gas production well (Site), located in Unit F of Section 26, Township 29 North, Range 11 West in San Juan County, New Mexico (Figure 1). Specifically, this report summarizes Site activities performed in January, February, and March of 2023 to the New Mexico Oil Conservation Division (NMOCD).

SVE SYSTEM SPECIFICATIONS

The original SVE system was installed at the Site in April 2016 by XTO Energy, the previous Site owner, in response to a release originating from a broken fiberglass line used to transfer natural gas condensate. The original SVE system was purchased from Geotech Environmental Equipment, Inc. (Geotech) and operated successfully until the summer of 2018. Due to a broken SVE blower motor, the Site's SVE system did not operate between 2018 and March of 2022; however, a rental SVE system was brought onto the Site and began operation on December 2, 2021. The blower motor from the original Geotech system was replaced on March 21, 2022 and the Geotech SVE system was put back into service.

The current Geotech SVE system is configured with vacuum applied to wells PR-1, MW-01, MW-02, MW-05, and MW-06 (shown on Figure 2). The SVE system consists of a 3 horsepower Rotron Model EN656 regenerative blower capable of producing 212 standard cubic feet per minute (scfm) of flow and 73 inches of water column (IWC) vacuum. The layout of the SVE system and piping is shown on Figure 2.

FIRST QUARTER 2023 ACTIVITIES

During the first quarter of 2023, Ensolum and Hilcorp personnel performed bi-weekly operation and maintenance (O&M) visits to verify the system was operating as designed and to perform any required maintenance. Field notes taken during O&M visits are presented in Appendix A. During the first quarter of 2023, all SVE wells (PR-1, MW-01, MW-02, MW-05, and MW-06) were operated in order to induce air flow through impacted soil within the source area. Between December 10, 2022 and March 13, 2023, the SVE system operated for 6,340.7 hours, with a runtime efficiency of 99 percent (%). Appendix B

presents photographs of the runtime meter for calculating the first quarter runtime efficiency. Table 1 presents the SVE system operational hours and percent runtime.

A first quarter emissions sample was collected from the SVE system on March 13, 2023 from a sample port located between the SVE piping manifold and the SVE blower using a high vacuum air sampler. 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), located in Albuquerque, New Mexico, for analysis of total volatile petroleum hydrocarbons (TVPH, also referred to 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 Processor Association (GPA) Method 2261. Table 2 presents a summary of analytical data collected during this sampling event and previous sampling events, with the full laboratory analytical report included in Appendix C.

Emission 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, 89,359 pounds (45 tons) of TVPH have been removed by the system to date.

RECOMMENDATIONS

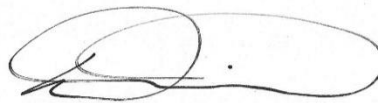
Bi-weekly O&M visits will continue to be performed by Ensolum and/or Hilcorp personnel to verify the SVE system is operating within normal working ranges (i.e., temperature, pressure, and vacuum). Deviations from regular operations will be noted on field logs and included in the following quarterly report. Hilcorp will continue operating the SVE until asymptotic emissions are observed. At that time, an evaluation of residual petroleum hydrocarbons will be assessed and further recommendations for remedial actions, if any, will be provided to NMOCD.

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 Layout

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

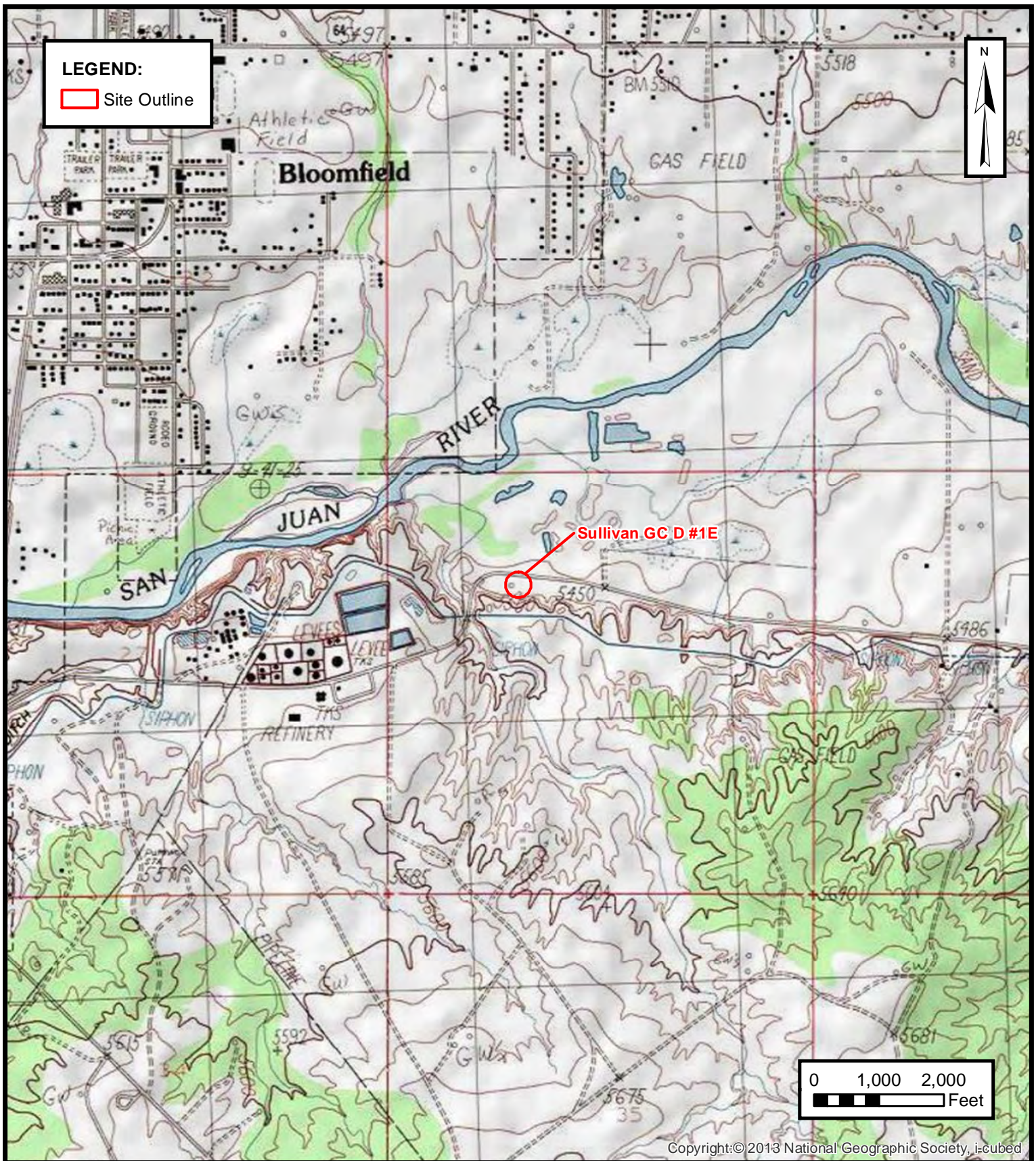
Hilcorp Energy Company
First Quarter 2023 – SVE System Update
Sullivan GC D#1E



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



FIGURES



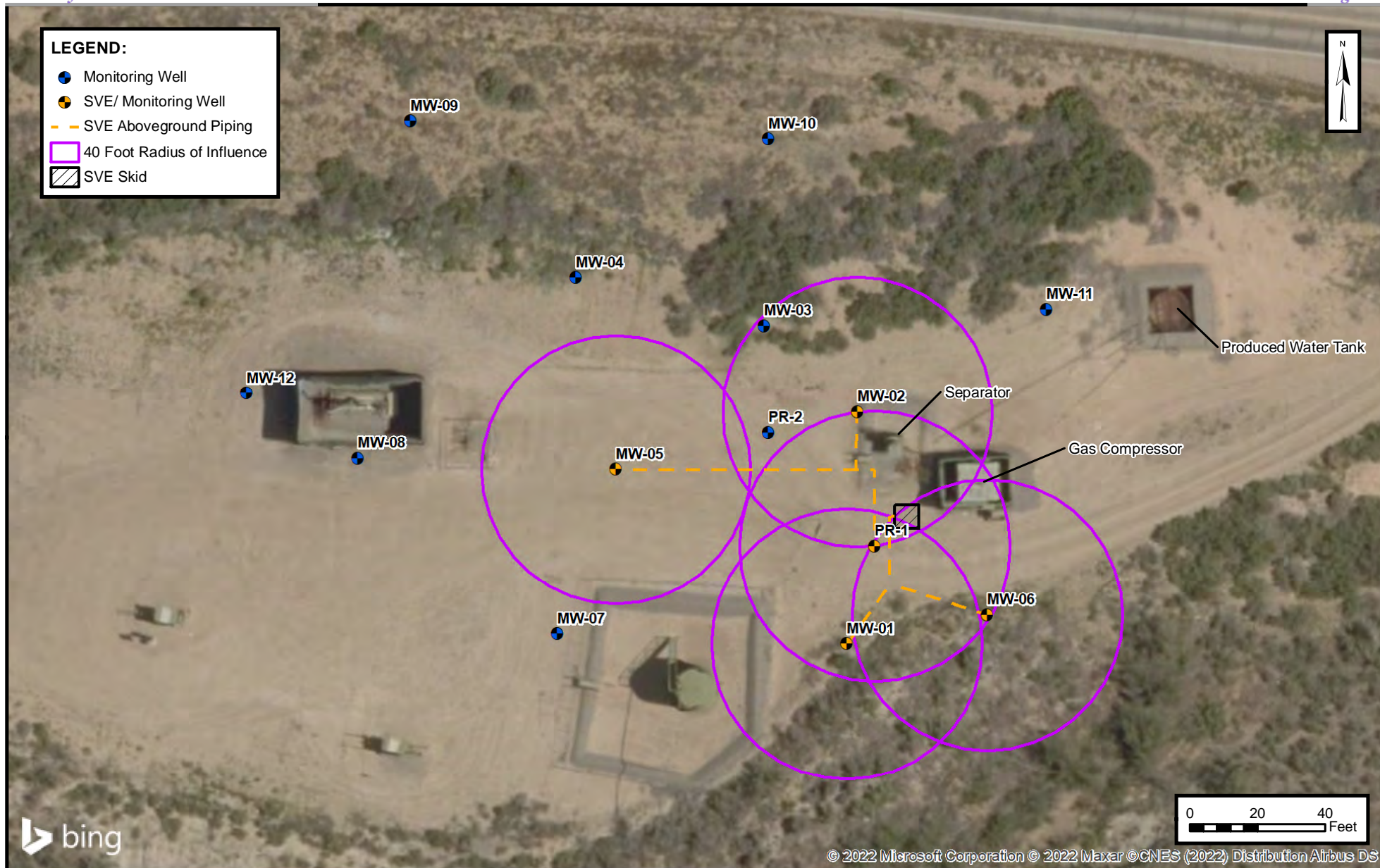
ENSOLUM
 Environmental & Hydrogeologic Consultants

SITE LOCATION

HILLCORP ENERGY COMPANY
 SULLIVAN GC D #1E
 San Juan County, New Mexico
 36.885855° N, 107.899525° W

PROJECT NUMBER: 07A1988029

FIGURE
1



SVE SYSTEM LAYOUT

HILCORP ENERGY COMPANY
SULLIVAN GC D #1E
San Juan County, New Mexico
36.885855° N, 107.899525° W

PROJECT NUMBER:07A1988029

FIGURE

2



TABLES



TABLE 1
SOIL VAPOR EXTRACTION SYSTEM RUNTIME CALCULATIONS

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

Permanent Geotech SVE Skid Runtime Operation

Date	Total Operational Hours	Delta Hours	Days	% Runtime
12/10/2022	6,340.7	--	--	--
3/13/2023	8,560.0	2,219.3	93	99%



TABLE 2
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS

Sullivan GC 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

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

<0.037: gray indicates result less than the stated laboratory reporting limit (RL)



TABLE 3
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS

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

Flow and Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
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
6/17/2022	327	0.10	0.10	0.10	0.25	10
9/22/2022	266	0.10	0.10	0.10	0.15	5.0
12/10/2022	68	0.75	4.9	0.49	9.0	490
3/13/2023	69	0.81	4.4	0.30	5.7	300
Average	1,673	181	489	29	346	37,489

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)
4/18/2016	90	0	0	0.28	0.64	0.029	0.28	47
4/20/2016	109	313,920	313,920	0.34	0.77	0.035	0.34	57
4/29/2017	90	1,480,320	1,166,400	0.19	0.49	0.025	0.25	35
8/11/2016	70	6,923,520	5,443,200	0.049	0.22	0.020	0.20	12
1/24/2018	60	--	--	0.015	0.094	0.011	0.15	4.9
6/29/2018	41	53,246,160	46,322,640	0.0084	0.027	0.001	0.063	3.7
12/2/2021	Rental SVE System Startup							
12/2/2021	49	53,246,160	0	0	0	0	0	0
3/16/2022	49	60,581,754	7,335,594	0.0014	0.00047	0.00047	0.0092	3.0
6/17/2022	80	70,724,634	10,142,880	0.000030	0.000030	0.000030	0.0002	0.011
9/22/2022	68	80,221,650	9,497,016	0.000025	0.000025	0.000025	0.000051	0.0019
12/10/2022	80	89,341,170	9,119,520	0.00013	0.00075	0.000088	0.0014	0.074
3/13/2023	75	99,328,020	9,986,850	0.00022	0.0013	0.00011	0.0021	0.11
Average				0.074	0.19	0.010	0.11	14

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
4/18/2016	0	0	0.0	0.0	0.0	0.0	0.0	0.0
4/20/2016	48	48	16	37	1.7	16	2,740	1.4
4/29/2017	264	216	41	105	5.5	53	7,452	3.7
8/11/2016	1,560	1,296	63	288	26	261	14,929	7.5
1/24/2018	--	--	--	--	--	--	--	--
6/29/2018	16,848	15,288	128	410	12	961	56,264	28
12/2/2021	Rental SVE System Startup							
12/2/2021	968	0	0.0	0.0	0.0	0.0	0.0	0.0
3/16/2022	3,463	2,495	3.5	1.2	1.2	23	7,559	3.8
3/21/2022	Permanent SVE System Startup							
3/21/2022	0	0	0.0	0.0	0.0	0.0	0.0	0.0
6/17/2022	2,113	2,113	0.063	0.063	0.063	0.43	23	0.012
9/22/2022	4,441	2,328	0.059	0.059	0.059	0.12	4.4	0.0022
12/10/2022	6,341	1,900	0.24	1.4	0.17	2.6	141	0.070
3/13/2023	8,560	2,219	0.49	2.9	0.25	4.6	246	0.12
Total Mass Recovery to Date			252	847	47	1,323	89,359	45

Notes:

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

gray: laboratory reporting limit used for calculating emissions



APPENDIX A

Field Notes

DATE: 1-6-23
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE ALARMS: (check if applicable)		HIGH/LOW VACUUM
		KO TANK HIGH LEVEL
		HIGH EXHAUST TEMPERATURE

SVE SYSTEM
Blower Hours (take photo)
Pre K/O Vacuum (IWC)
Post K/O Vacuum (IWC)
Total Flow (cfm)
Zone 1/ Leg A Flow (scfm)
Inlet PID
Exhaust Post GAC PID
Liquid in K/O Sight Tube (Y/N)
K/O Liquid Drained (gallons)

READING _____ TIME _____

READING	TIME
6986.5	1751
36	
38	
80	
109.3	
201.4	
7.5	

HOUSEKEEPING Check

Inline Filter Clean
Clean tank level alarm on skimmer

SAMPLE ID:

Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)

SAMPLE TIME:

OPERATING WELLS

Change in Well Operation:

Zone 1/ Leg A

Zone 1/ Leg A	LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
	MW-01		36.32	
	MW-02		27.91	
	MW-05		20.9	
	MW-06		55.63	
	PR-1		45.03	

[illegible]

COMMENTS/OTHER MAINTENANCE:

Overflow tank was nearly $\frac{1}{2}$ full.

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

HOUSEKEEPING		Check
Inline Filter Clean		
Clean tank level alarm on skimmer		

OPERATING WELLS

Drained $\sim 1/4g$ from overflow tank

DATE: 2-23
TIME ONSITE:

O&M PERSONNEL:
TIME OFFSITE:

B Sinclair

SVE ALARMS: (check if applicable)	<input type="checkbox"/>	HIGH/LOW VACUUM
	<input type="checkbox"/>	KO TANK HIGH LEVEL
	<input type="checkbox"/>	HIGH EXHAUST TEMPERATURE

Product Skimmer
 Hours (take photo) _____
 Volume in bbl _____
 Volume removed _____
 Volume removed to date _____

Blower Hours (take photo)
Pre K/O Vacuum (IWC)
Post K/O Vacuum (IWC)
Total Flow (cfm)
Zone 1/ Leg A Flow (scfm)
Inlet PID
Exhaust Post GAC PID
Liquid in K/O Sight Tube (Y/N)
K/O Liquid Drained (gallons)

READING

TIME

8137.2

1417

36

37

75

22

89.5

180.8

Inline Filter Clean	
Clean tank level alarm on skimmer	

SAMPLE ID:

Analytes:	TVPH (8015), VOCs (8260), Fixed Gas (CO/CO ₂ /O ₂)
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SAMPLE TIME:

OPERATING WELLS

ZONES

Change in Well Operation:

Zone 1/ Leg A

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		46.6	
MW-02		25.9	
MW-05		299.2	
MW-06		65.5	
PR-1		49.6	

Product Recovery

Well

[illegible]

COMMENTS/OTHER MAINTENANCE:

Drained $\frac{1}{4}$ of overflow tank.

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

DATE: 3-22
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE:

SVE ALARMS: (check if applicable)		HIGH/LOW VACUUM
		KO TANK HIGH LEVEL
		HIGH EXHAUST TEMPERATURE

SVE SYSTEM	READING	TIME
Blower Hours (take photo)	8782	1957
Pre K/O Vacuum (IWC)	39	
Post K/O Vacuum (IWC)	38	
Total Flow (cfm)	65	
Zone 1/ Leg A Flow (scfm)		
Inlet PID	83.8	
Exhaust Post GAC PID	152.8	
Liquid in K/O Sight Tube (Y/N)		
K/O Liquid Drained (gallons)		

Inline Filter Clean	
Clean tank level alarm on skimmer	

SAMPLE ID:		SAMPLE TIME:	
------------	--	--------------	--

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

ZONES

Change in Well Operation:

Zone 1/ Leg A

Zone 1/ Leg A			
LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
MW-01		33.9	
MW-02		23.7	
MW-05		26.5	
MW-06		60.8	
PR-1		45.6	

Product Recovery

Well

[illegible]



COMMENTS/OTHER MAINTENANCE:



APPENDIX B

Project Photographs

PROJECT PHOTOGRAPHS
Sullivan GC D #1E
San Juan County, New Mexico
Hilcorp Energy Company

Photograph 1 Runtime meter taken on December 10, 2022 at 4:43 PM Hours = 6,340.7	
Photograph 2 Runtime meter taken on March 13, 2023 at 2:44 PM Hours = 8,568.0	



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

March 29, 2023

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

RE: Sullivan GC D 1E

OrderNo.: 2303696

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 3/14/2023 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 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".

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2303696

Date Reported: 3/29/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SVE-1

Project: Sullivan GC D 1E

Collection Date: 3/13/2023 2:30:00 PM

Lab ID: 2303696-001

Matrix:

Received Date: 3/14/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	0.81	0.10		µg/L	1	3/16/2023 4:12:00 PM
Toluene	4.4	0.10		µg/L	1	3/16/2023 4:12:00 PM
Ethylbenzene	0.30	0.10		µg/L	1	3/16/2023 4:12:00 PM
Methyl tert-butyl ether (MTBE)	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2,4-Trimethylbenzene	0.34	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,3,5-Trimethylbenzene	0.85	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2-Dichloroethane (EDC)	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2-Dibromoethane (EDB)	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Naphthalene	ND	0.20		µg/L	1	3/16/2023 4:12:00 PM
1-Methylnaphthalene	ND	0.40		µg/L	1	3/16/2023 4:12:00 PM
2-Methylnaphthalene	ND	0.40		µg/L	1	3/16/2023 4:12:00 PM
Acetone	ND	1.0		µg/L	1	3/16/2023 4:12:00 PM
Bromobenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Bromodichloromethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Bromoform	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Bromomethane	ND	0.20		µg/L	1	3/16/2023 4:12:00 PM
2-Butanone	ND	1.0		µg/L	1	3/16/2023 4:12:00 PM
Carbon disulfide	ND	1.0		µg/L	1	3/16/2023 4:12:00 PM
Carbon tetrachloride	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Chlorobenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Chloroethane	ND	0.20		µg/L	1	3/16/2023 4:12:00 PM
Chloroform	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Chloromethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
2-Chlorotoluene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
4-Chlorotoluene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
cis-1,2-DCE	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
cis-1,3-Dichloropropene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2-Dibromo-3-chloropropane	ND	0.20		µg/L	1	3/16/2023 4:12:00 PM
Dibromochloromethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Dibromomethane	ND	0.20		µg/L	1	3/16/2023 4:12:00 PM
1,2-Dichlorobenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,3-Dichlorobenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,4-Dichlorobenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Dichlorodifluoromethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,1-Dichloroethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,1-Dichloroethene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2-Dichloropropane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,3-Dichloropropane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
2,2-Dichloropropane	ND	0.10		µg/L	1	3/16/2023 4:12:00 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 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 1 of 2

Analytical Report

Lab Order 2303696

Date Reported: 3/29/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: SVE-1

Project: Sullivan GC D 1E

Collection Date: 3/13/2023 2:30:00 PM

Lab ID: 2303696-001

Matrix:

Received Date: 3/14/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: CCM
1,1-Dichloropropene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Hexachlorobutadiene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
2-Hexanone	ND	1.0		µg/L	1	3/16/2023 4:12:00 PM
Isopropylbenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
4-Isopropyltoluene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
4-Methyl-2-pentanone	ND	1.0		µg/L	1	3/16/2023 4:12:00 PM
Methylene chloride	ND	0.30		µg/L	1	3/16/2023 4:12:00 PM
n-Butylbenzene	ND	0.30		µg/L	1	3/16/2023 4:12:00 PM
n-Propylbenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
sec-Butylbenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Styrene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
tert-Butylbenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,1,1,2-Tetrachloroethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,1,2,2-Tetrachloroethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Tetrachloroethene (PCE)	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
trans-1,2-DCE	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
trans-1,3-Dichloropropene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2,3-Trichlorobenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2,4-Trichlorobenzene	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,1,1-Trichloroethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,1,2-Trichloroethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Trichloroethene (TCE)	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Trichlorofluoromethane	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
1,2,3-Trichloropropane	ND	0.20		µg/L	1	3/16/2023 4:12:00 PM
Vinyl chloride	ND	0.10		µg/L	1	3/16/2023 4:12:00 PM
Xylenes, Total	5.7	0.15		µg/L	1	3/16/2023 4:12:00 PM
Surr: Dibromofluoromethane	90.6	70-130		%Rec	1	3/16/2023 4:12:00 PM
Surr: 1,2-Dichloroethane-d4	84.6	70-130		%Rec	1	3/16/2023 4:12:00 PM
Surr: Toluene-d8	112	70-130		%Rec	1	3/16/2023 4:12:00 PM
Surr: 4-Bromofluorobenzene	91.3	70-130		%Rec	1	3/16/2023 4:12:00 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: CCM
Gasoline Range Organics (GRO)	300	5.0		µg/L	1	3/16/2023 4:12:00 PM
Surr: BFB	94.2	70-130		%Rec	1	3/16/2023 4:12:00 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 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 2 of 2



ANALYTICAL SUMMARY REPORT

March 29, 2023

Hall Environmental

4901 Hawkins St NE Ste D

Albuquerque, NM 87109-4372

Work Order: B23031067

Quote ID: B15626

Project Name: Not Indicated

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 3/15/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23031067-001	2303696-001B, SVE-1	03/13/23 14:30	03/15/23	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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www.energylab.com

Billings, MT 800.735.4489 • Casper, WY 888.235.0515
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: B23031067-001
Client Sample ID: 2303696-001B, SVE-1

Report Date: 03/29/23
Collection Date: 03/13/23 14:30
Date Received: 03/15/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
GAS CHROMATOGRAPHY ANALYSIS REPORT							
Oxygen	21.15	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Nitrogen	78.22	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Carbon Dioxide	0.51	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Methane	0.10	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Ethane	0.02	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Propane	<0.01	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Hexanes plus	<0.01	Mol %		0.01		GPA 2261-95	03/16/23 09:13 / ikc
Propane	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc
Hexanes plus	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc
GPM Total	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc
GPM Pentanes plus	< 0.001	gpm		0.001		GPA 2261-95	03/16/23 09:13 / ikc

CALCULATED PROPERTIES

Gross BTU per cu ft @ Std Cond. (HHV)	1		1		GPA 2261-95	03/16/23 09:13 / ikc
Net BTU per cu ft @ std cond. (LHV)	1		1		GPA 2261-95	03/16/23 09:13 / ikc
Pseudo-critical Pressure, psia	546		1		GPA 2261-95	03/16/23 09:13 / ikc
Pseudo-critical Temperature, deg R	240		1		GPA 2261-95	03/16/23 09:13 / ikc
Specific Gravity @ 60/60F	0.999		0.001		D3588-81	03/16/23 09:13 / ikc
Air, %	96.63		0.01		GPA 2261-95	03/16/23 09:13 / ikc

- The analysis was not corrected for air.

COMMENTS

- 03/16/23 09:13 / ikc

- 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)



QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Work Order: B23031067

Report Date: 03/29/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261-95									Batch: R399026	
Lab ID: B23031067-001ADUP 12 Sample Duplicate									Run: GCNGA-B_230316A 03/16/23 09:40	
Oxygen		21.2	Mol %	0.01				0.0	20	
Nitrogen		78.2	Mol %	0.01				0	20	
Carbon Dioxide		0.51	Mol %	0.01				0.0	20	
Hydrogen Sulfide		<0.01	Mol %	0.01					20	
Methane		0.11	Mol %	0.01				9.5	20	
Ethane		0.02	Mol %	0.01				0.0	20	
Propane		<0.01	Mol %	0.01					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: LCS031623 11 Laboratory Control Sample									Run: GCNGA-B_230316A 03/16/23 12:52	
Oxygen		0.64	Mol %	0.01	128	70	130			
Nitrogen		6.15	Mol %	0.01	102	70	130			
Carbon Dioxide		1.06	Mol %	0.01	107	70	130			
Methane		74.0	Mol %	0.01	99	70	130			
Ethane		6.14	Mol %	0.01	102	70	130			
Propane		5.13	Mol %	0.01	104	70	130			
Isobutane		2.03	Mol %	0.01	101	70	130			
n-Butane		2.02	Mol %	0.01	101	70	130			
Isopentane		1.02	Mol %	0.01	102	70	130			
n-Pentane		1.01	Mol %	0.01	101	70	130			
Hexanes plus		0.77	Mol %	0.01	96	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

Work Order Receipt Checklist

Hall Environmental

B23031067

Login completed by: Leslie S. Cadreau

Date Received: 3/15/2023

Reviewed by: tedwards

Received by: Isc

Reviewed Date: 3/20/2023

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	17.6°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

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 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975
FAX: 505-345-4107
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										
CITY, STATE, ZIP:		Billings, MT 59107										
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	ANALYTICAL COMMENTS						
1	2303696-001B	SVE-1	TEDLAR		3/13/2023 2:30:00 PM	Fixed Gases						
						B23031067						

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:	Date:	Time:	Received By:	Date:	Time:	REPORT TRANSMITTAL DESIRED:	
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	<input type="checkbox"/> HARDCOPY (extra cost)	<input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	FOR LAB USE ONLY	
TAT:			RUSH			Temp of samples	Attempt to Cool ?
Standard <input type="checkbox"/>			Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>			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: 2303696

RcptNo: 1

Received By: Tracy Casarrubias 3/14/2023 6:30:00 AM

Completed By: Tracy Casarrubias 3/14/2023 6:47:16 AM

Reviewed By: *J 3-14-23*

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° 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: *JN 3/14/23*

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	NA	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp

Mailing Address:

Phone #:

email or Fax# Brandon.Sinclair@hilcorp.com

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other☐ EDD (Type)

Date	Time	Matrix	Sample Name
3-13	1430	air	SVE-1

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Sullivan GC D IE

Project #:

Project Manager:

Kate KaufmanSampler: Brandon SinclairOn Ice: ☒ Yes ☐ No# of Coolers: 1Cooler Temp (including CF): N/A (°C)

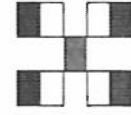
Container Type and #

2 Tedlar

Preservative Type

001

HEAL No.

23030916HALL ENVIRONMENTAL
ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

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 ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	8015 TPH	Fixed gases O ₂ , CO ₂
							<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:

Received by: Jim W Date: 3/13/23 Time: 1731Received by: owner Date: 3/14/23 Time: 6:30

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 207380

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 207380
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	1. Follow the recommendations provided. 2. OCD will require quarterly report for 2023. Next report due no later than July 31, 2023. 3. Since the system was re-started in December 2021, OCD will accept bi-annual (twice a year) reporting initiating in 2024.	5/11/2023