NV

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April 13, 2022

New Mexico Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
1000 Rio Brazos Road
Aztec, New Mexico 87410

Re: First Quarter 2022 – SVE System Update
OH Randel #5
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NVF1602039091
Ensolum Project No. 07A1988025

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *First Quarter 2022 – SVE System Update* report summarizing the soil vapor extraction (SVE) system performance at the OH Randel #5 natural gas production well (Site), located in Unit D of Section 10, Township 26 North, and Range 11 West in San Juan County, New Mexico (Figure 1). Specifically, this report summarizes Site activities performed in January, February, and March of 2022 to the New Mexico Oil Conservation Division (NMOCD).

SVE SYSTEM SPECIFICATIONS

The current operation at the Site consists of two SVE systems each with a dedicated blower, knockout tank, and control panel. The original SVE system ("SVE Skid 1") was installed at the Site by XTO Energy (the previous owner and operator of the Site) in 2016 and subsequently upgraded by Hilcorp in 2019. This system consists of a 2 horsepower Atlantic Blower AB-301 blower capable of producing 110 standard cubic feet per minute (scfm) of flow and 72 inches of water column (IWC) vacuum. A second SVE system ("SVE Skid 2") was installed at the Site and became operational on March 11, 2022 in order to more efficiently address residual soil impacts at the Site. Specifically, the new system was built with a 3.4 horsepower Republic Manufacturing HRC501 blower capable of producing 221 scfm of flow and 72 IWC vacuum. When operated concurrently, the two SVE systems are able to induce the necessary flow and vacuum on all SVE wells at the Site simultaneously with no need to rotate operating wells.

SVE wells are located and screened in the "Secondary" and "Tertiary" Source Zones, as identified in the WSP *Site Summary Report* (dated October 1, 2021). Once the new SVE system, Skid 2, was installed at the Site, new manifolds were constructed so that Skid 1 operated wells located in the Secondary Source Zone and Skid 2 operated wells located in the Tertiary Source Zone. Specifically, the SVE systems are connected to the following SVE wells:

SVE Skid 1: Secondary Source Zone

- SVE-5 and SVE-8

SVE Skid 2: Tertiary Source Zone

- SVE-6, SVE-7, SVE-10, SVE-11, SVE-12, SVE-13, SVE-14, SVE-15, SVE-16, SVE-17, SVE-18, SVE-19, SVE-20, SVE-21, and SVE-22.

The SVE well locations are shown on Figure 2.

FIRST QUARTER 2022 ACTIVITIES

During the first quarter of 2022, WSP USA Inc. (WSP, third-party environmental consultant for the Site) and Hilcorp personnel performed bi-weekly operation and maintenance 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 2022, SVE wells were operated in order to induce flow in areas with remaining soil impacts.

Between January 10 and March 16, 2022, SVE Skid 1 operated for 1,550 hours for a runtime efficiency of 99.4 percent (%). Between March 11 (system startup) and March 16, 2022, SVE Skid 2 operated for 119 hours for a runtime efficiency of 99.2%. Table 1 presents the SVE system operational hours and percent runtime. Appendix B presents photographs of the runtime meters taken during the first and last field visits of the quarter.

A first quarter 2022 emissions sample was collected from both SVE systems on March 21, 2022 from sample ports located between the SVE piping manifold and the SVE blower using a high vacuum air sampler. Prior to collection, the emission samples were field screened with a photoionization detector (PID) for organic vapor monitoring (OVM). The emission samples were collected directly into a 1-Liter Tedlar® bag 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 (GPS) 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.

Of note, analytical results collected from SVE Skid 1 appear to have significantly decreased based on historical data. However, the sample from Skid 1 was collected after the new system manifolds were constructed and Skid 1 was only connected to two SVE wells, SVE-5 and SVE-8, during sampling (as opposed to all of the Site SVE wells). SVE Skid 2 is currently operating the majority of the Site SVE wells and, consequently, the sample collected from Skid 2 contains TVPH and VOC concentrations similar to historical results for the Site.

Emission sample data and measured stack flow rates are used to estimate total mass recovered and total emissions generated by the SVE systems (Table 3). Based on these estimates, a total of 671,401 pounds (335 tons) of TVPH have been removed by the systems to date.

RECOMMENDATIONS

Bi-weekly operation and maintenance (O&M) visits will continue to be performed by Ensolum and/or Hilcorp personnel to verify the SVE systems are 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 systems until asymptotic emissions are observed. At that time, an evaluation of residual petroluem 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 New Mexico Oil Conservation Division. If you should have any questions or comments regarding this proposal, 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
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Attachments:

Figure 1	Site Location Map
Figure 2	SVE System Layout
Table 1	Soil Vapor Extraction System Runtime Calculations
Table 2	Soil Vapor Extraction System Emissions Analytical Results
Table 3	Soil Vapor Extraction System Mass Removal and Emissions – Skid 1
Table 4	Soil Vapor Extraction System Mass Removal and Emissions – Skid 2
Appendix A	Field Notes
Appendix B	Project Photographs
Appendix C	Laboratory Analytical Reports

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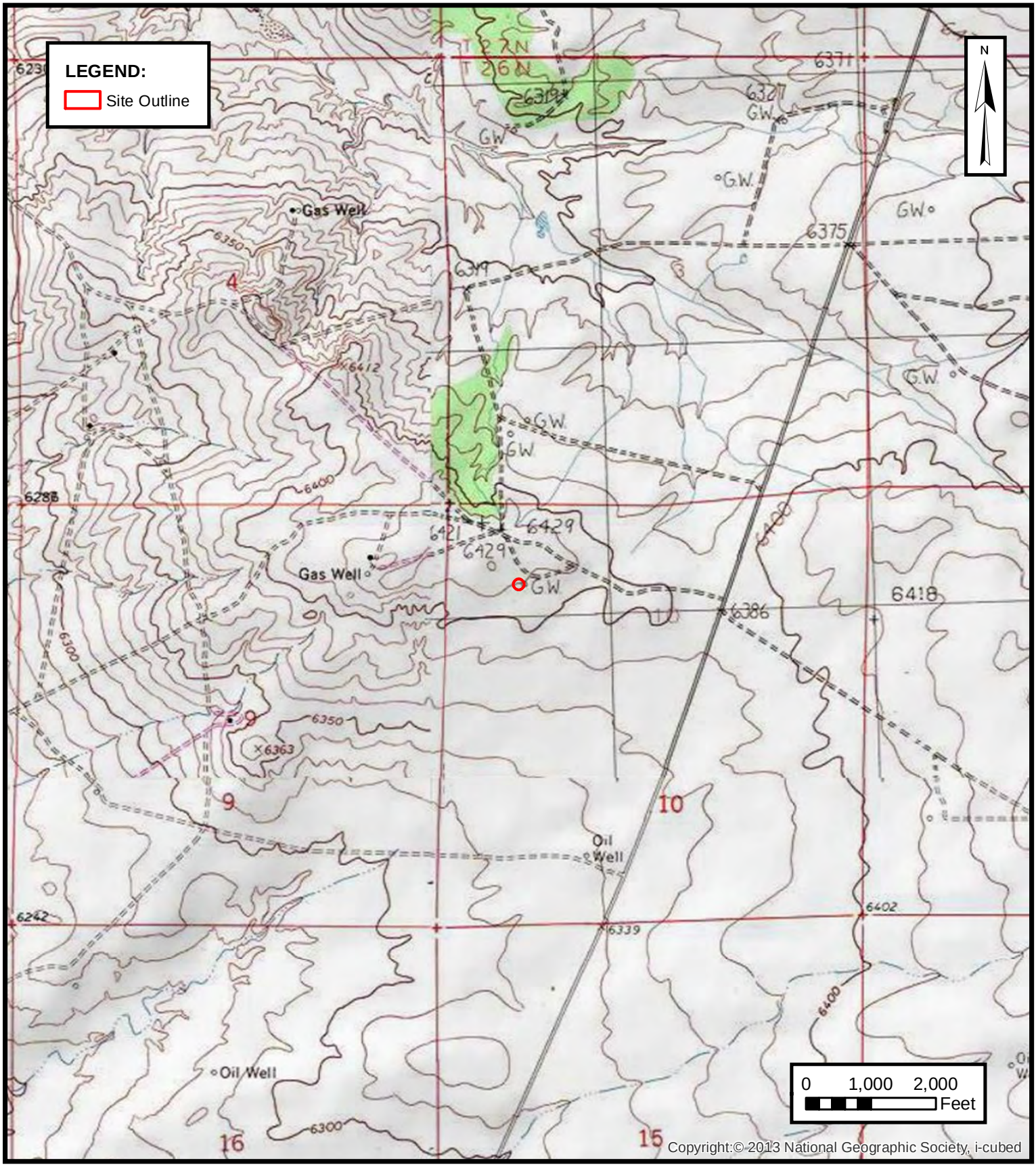
FIGURES



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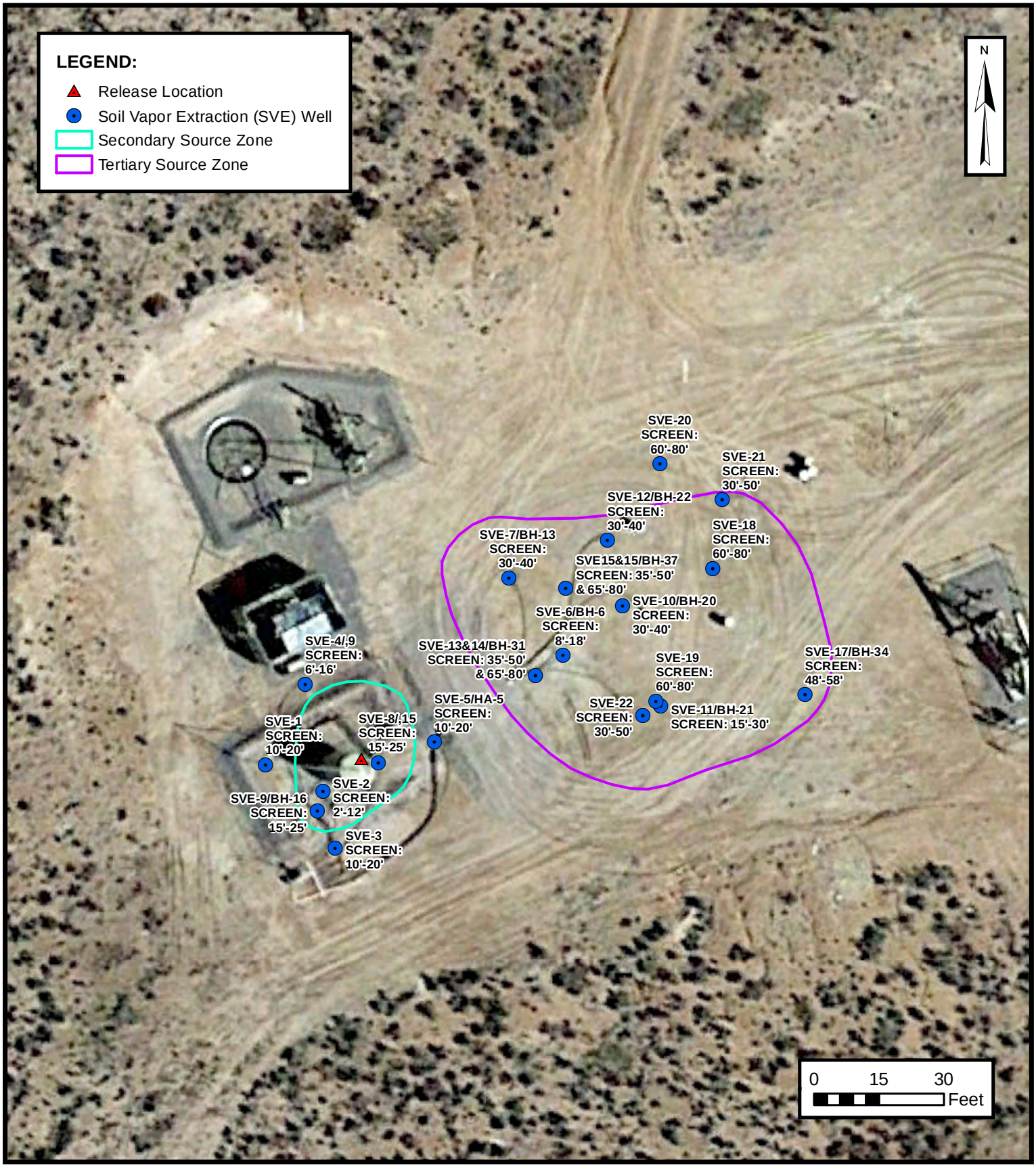
Environmental & Hydrogeologic Consultants

SITE LOCATION MAP

HILCORP ENERGY COMPANY
OH RANDEL #5
NWNW SEC 10 T26N R11W, San Juan County, New Mexico
36.506504° N, 107.996993° W

PROJECT NUMBER: 07A1988025

FIGURE
1



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SVE SYSTEM LAYOUT

HILCORP ENERGY COMPANY
OH RANDEL #5
NWNW SEC 10 T26N R11W, San Juan County, New Mexico
36.506504° N, 107.996993° W

PROJECT NUMBER: 07A1988025

FIGURE
2

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TABLES

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TABLE 1
SOIL VAPOR EXTRACTION SYSTEM RUNTIME CALCULATIONS
Hilcorp Energy Company - OH Randel #5
San Juan County, New Mexico

Ensolum Project No. 07A1988025

SVE Skid 1 - Original System Runtime Operation

Date	Total Operational Hours	Delta Hours	Days	Percent Runtime
1/10/2022	30,678	--	--	--
3/16/2022	32,228	1,550	65	99.4%

SVE Skid 2 - New System Runtime Operation

Date	Total Operational Hours	Delta Hours	Days	Percent Runtime
3/11/2022	0	--	--	--
3/16/2022	119	119	5	99.2%

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TABLE 2
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS
Hilcorp Energy Company - OH Randel #5
San Juan County, New Mexico

Ensolum Project No. 07A1988025

SVE Skid 1 - Original System Analytical Results

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)	Oxygen (%)	Carbon Dioxide (%)
8/11/2016	4,072	160	1,700	61	500	46,000	--	--
8/17/2018	719	130	230	10	110	8,900	--	--
6/28/2019	1,257	7,200	15,000	360	3,000	460,000	--	--
12/16/2019	1,685	1,800	4,400	83	660	170,000	--	--
3/10/2020	897	1,700	3,300	89	700	130,000	--	--
4/30/2020	1,853	2,440	4,737	128	1,005	186,592	--	--
6/24/2020 (1)	--	--	--	--	--	--	--	--
11/10/2020	1,385	320	1,100	43	380	43,000	21.5%	0.350%
2/10/2021	865	360	950	35	250	32,000	--	--
6/11/2021	400	170	390	11	110	18,000	22.1%	0.151%
9/29/2021	505	99	190	7.0	55	8,200	--	--
12/15/2021	1,163	130	290	6.9	62	37,137	22.2%	0.0920%
3/21/2022	274	6.5	23	0.98	11	550	22.4%	0.0410%

SVE Skid 2 - Original System Analytical Results

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)	Oxygen (%)	Carbon Dioxide (%)
3/21/2022	1,354	310	510	13	120	35,000	21.8%	0.310%

Notes:

(1) - blower not operational for sampling in May and June 2020

GRO: gasoline range organics

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

%: percent

--: not sampled

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TABLE 3
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS - SKID 1
Hilcorp Energy Company - OH Randel #5
San Juan County, New Mexico

Ensolum Project No. 07A1988025

Flow and Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
8/11/2016	4,072	160	1,700	61	500	46,000
8/17/2018	719	130	230	10	110	8,900
12/16/2019	1,902	1,800	4,400	83	660	170,000
3/10/2020	897	1,700	3,300	89	700	130,000
4/30/2020	1,853	2,440	4,737	128	1,005	186,592
6/24/2020	Blower Not Operational (1)					
11/10/2021	1,385	320	1,100	43	380	43,000
2/10/2021	865	360	950	35	250	32,000
6/11/2021	400	170	390	11	110	18,000
9/29/2021	505	99	190	7.0	55	8,200
12/15/2021	1,163	130	290	6.9	62	37,137
3/21/2022	274	7	23	1.0	11	550
Average	1,276	665	1,574	43	349	61,853

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)
8/11/2016	105	31,500	31,500	0.063	0.67	0.024	0.20	18
8/17/2018	100	59,647,500	59,616,000	0.054	0.36	0.013	0.11	10
12/16/2019	110	109,635,900	49,988,400	0.40	0.95	0.019	0.16	37
3/10/2020	110	121,707,300	12,071,400	0.72	1.6	0.035	0.28	62
4/30/2020 (1)	105	130,917,900	9,210,600	0.81	1.6	0.043	0.33	62
6/24/2020 (1)	Blower Not Operational							
11/10/2021	105	130,917,900	0	0	0	0	0	0
2/10/2021	92	143,580,780	12,662,880	0.12	0.35	0.013	0.11	13
6/11/2021	90	158,657,580	15,076,800	0.089	0.23	0.0077	0.061	8.4
9/29/2021	69	168,249,960	9,592,380	0.035	0.075	0.0023	0.021	3.4
12/15/2021	90	178,207,560	9,957,600	0.039	0.081	0.0023	0.020	7.6
3/16/2022	70	187,343,904	9,136,344	0.018	0.041	0.0010	0.010	4.9
			Average	0.23	0.59	0.02	0.13	22

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
8/11/2016	5	5	0.31	3.3	0.12	1.0	90	0.045
8/17/2018	9,941	9,936	539	3,586	132	1,133	102,008	51
12/16/2019	17,515	7,574	3,007	7,214	145	1,200	278,728	139
3/10/2020	19,344	1,829	1,317	2,897	65	512	112,870	56
4/30/2020 (1)	20,806	1,462	1,188	2,307	62	489	90,884	45
6/24/2020 (1)	Blower Not Operational							
11/10/2021	20,806	0	0	0	0	0	0	0
2/10/2021	23,100	2,294	268	809	31	249	29,600	15
6/11/2021	25,892	2,792	249	630	22	169	23,495	12
9/29/2021	28,209	2,317	80	173	5.4	49	7,833	3.9
12/15/2021	30,053	1,844	71	149	4.3	36	14,070	7.0
3/16/2022	32,228	2,175	39	89	2.2	21	10,732	5.4
		Total Mass Recovery to Date	6,759	17,857	468	3,859	670,311	335

Notes:

(1) - blower not operational for sampling in May and June 2020

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

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TABLE 4
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS - SKID 2
Hilcorp Energy Company - OH Randel #5
San Juan County, New Mexico

Ensolum Project No. 07A1988025

Flow and Laboratory Analysis

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
3/21/2022	1,354	310	510	13.0	120	35,000
Average	1,354	310	510	13	120	35,000

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)
3/16/2022	70	499,800	499,800	0.081	0.13	0.0034	0.031	9.2
			Average	0.081	0.13	0.0034	0.031	9.2

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
3/16/2022	119	119	10	16	0.41	3.7	1,090	0.55
		Total Mass Recovery to Date	10	16	0.41	3.7	1,090	0.55

Notes:

cf: cubic feet

cfm: cubic feet per minute

µg/L: micrograms per liter

lb/hr: pounds per hour

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

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APPENDIX A

Field Notes

Location Ofl Randel #5 Date 1-10-22

Project / Client HEC

DB/RH T125, HVAS, PID Sunny, 40s

1215 - Onsite for O+M
System Running upon arrival.
All wells open

Well	Vac	PID
SVE-5		167.0
7		702.2
8		304.5
9		139.0
10		338.7
12		743.3
13		917.5
14		832.9
15		593.3
16		996.7
17		276.2
18		1204
19		1158
20		802.5
21		234.7
22		426.0

Location Ott Randel #5 Date 1-10-22

Project / Client

O+M cont'd

- 25 gal drained from KO tank after seeing slug of liquid come thru lines and pass thru blower + into exhaust. Didnot trip High Level float.
- Liquid from condensation.

Flow @ Influent 2"; thermoanemometer ~3,500 fpm @55°F

Flow @ Exhaust 2"

~

Influent PID - 824

Exhaust PID - 1915

Hours @ 1405 - Picture taken.

Exhaust ~3460 ft/mn 85.2°F

Vaccum = ~~30~~ 32 In H_2O

Hours: 30678.32

OH RANDEL #5 SVE SYSTEM
BIWEEKLY O&M FORM

DATE: 2/4/22 | O&M PERSONNEL: Reece Hanson
TIME ONSITE: 925 | TIME OFFSITE: 1005

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: ~ | KO TANK HIGH LEVEL: ~

SVE SYSTEM	READING	TIME
Blower Hours (take photo)	31270.195	929
Inlet Vacuum (IWC)	-30	930
Inlet Thermal Anemometer Flow (fpm)	~3200	940
Exhaust Thermal Anemometer Flow (fpm)	~2500	940
Inlet PID	414.4	950
Exhaust PID	408.7	952
K/O Tank Liquid Level	~	
K/O Liquid Drained (gallons)	0	

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE-5				
SVE-8				

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE-6				
SVE-7				
SVE-10				
SVE-11				
SVE-12				
SVE-13				
SVE-14				
SVE-15				
SVE-16				
SVE-17				
SVE-18				
SVE-19				
SVE-20				
SVE-21				
SVE-22				

COMMENTS/OTHER MAINTENANCE:

Drain valve handle from K/O tank detached. Unable to get K/O tank to drain, possible ice in drain pipe

OH RANDEL #5 SVE SYSTEM
BIWEEKLY O&M FORM

DATE: 3/3/22 | O&M PERSONNEL: Reece Hanson
TIME ONSITE: 1045 | TIME OFFSITE: 12:15

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: — | KO TANK HIGH LEVEL NO

SVE SYSTEM	READING	TIME
Blower Hours (take photo)	3191.01	1058
Inlet Vacuum (IWC)	-34	1100
Inlet Thermal Anemometer Flow (fpm)	3186	
Exhaust Thermal Anemometer Flow (fpm)	4378	
Inlet PID	15.1	
Exhaust PID	680.8	
K/O Tank Liquid Level		
K/O Liquid Drained (gallons)	9	

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE-5				
SVE-8				

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE-6				
SVE-7				
SVE-10				
SVE-11				
SVE-12				
SVE-13				
SVE-14				
SVE-15				
SVE-16				
SVE-17				
SVE-18				
SVE-19				
SVE-20				
SVE-21				
SVE-22				

COMMENTS/OTHER MAINTENANCE:

KO tank drained much slower than usual, may need new ball valve

OH RANDEL #5 SVE SYSTEM
BIWEEKLY O&M FORM

DATE: 3/16/22 — O&M PERSONNEL: E. Carroll
TIME ONSITE: 11:45 — TIME OFFSITE:

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: | KO TANK HIGH LEVEL

SVE SYSTEM	B7 READING	B2	TIME
Blower Hours (take photo)	32228.32	119.1	11:45
Inlet Vacuum (IWC)	54	60	
Inlet Thermal Anemometer Flow (fpm)	70	60 50	
Exhaust Thermal Anemometer Flow (fpm)			
Inlet PID	274	1354	
Exhaust PID	261	1462	
K/O Tank Liquid Level		Empty	
K/O Liquid Drained (gallons)	2	0	

All Legs open

SVE SYSTEM - QUARTERLY SAMPLING

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

ZONES

Change in Well Operation:

Zone A - Secondary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE-5				
SVE-8				

Zone B - Tertiary Impacts

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE-6				
SVE-7				
SVE-10				
SVE-11				
SVE-12				
SVE-13				
SVE-14				
SVE-15				
SVE-16				
SVE-17				
SVE-18				
SVE-19				
SVE-20				
SVE-21				
SVE-22				

COMMENTS/OTHER MAINTENANCE:

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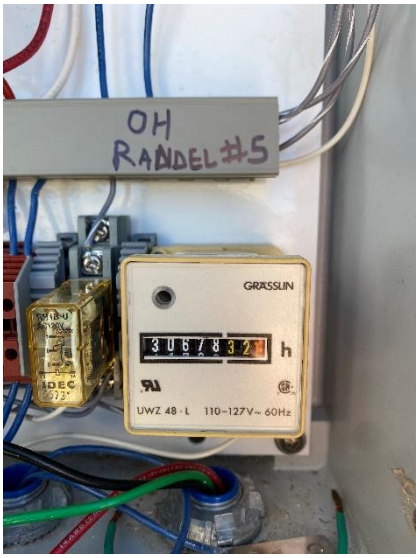
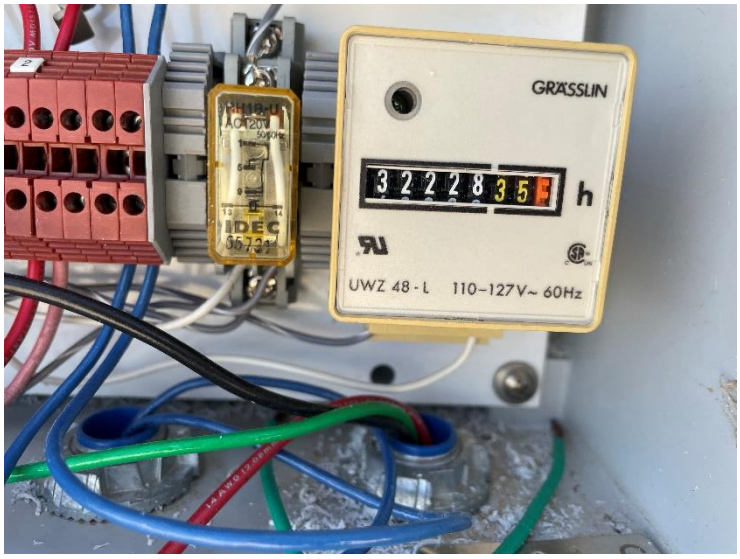
APPENDIX B

Project Photographs

PROJECT PHOTOGRAPHS
OH Randel #5
San Juan County, New Mexico
Hilcorp Energy Company

Photograph 1 Runtime meter taken on January 10, 2022 from SVE Skid 1 (original SVE system)	
Photograph 2 Runtime meter taken on March 16, 2022 from SVE Skid 1	

Ensolum, LLC | Environmental & Hydrogeologic Consultants
Durango, Colorado | info@ensolum.com

PROJECT PHOTOGRAPHS
OH Randel #5
San Juan County, New Mexico
Hilcorp Energy Company

Photograph 3 Runtime meter taken on March 11, 2022 from SVE Skid 2 (newly installed system)	
Photograph 4 Runtime meter taken on March 16, 2022 from SVE Skid 2	

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APPENDIX C

Laboratory Analytical Reports

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

March 30, 2022

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

RE: OH Randel 5 OrderNo.: 2203B44

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 2 sample(s) on 3/22/2022 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2203B44**
Date Reported: **3/30/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Influent SVE Skid #1
Project: OH Randel 5
Collection Date: 3/21/2022 3:30:00 PM
Lab ID: 2203B44-001 **Matrix:** AIR
Received Date: 3/22/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	550	25		µg/L	5	3/24/2022 9:35:32 AM
Surr: BFB	130	15-380		%Rec	5	3/24/2022 9:35:32 AM
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
Benzene	6.5	0.50		µg/L	5	3/22/2022 5:59:00 PM
Toluene	23	0.50		µg/L	5	3/22/2022 5:59:00 PM
Ethylbenzene	0.98	0.50		µg/L	5	3/22/2022 5:59:00 PM
Methyl tert-butyl ether (MTBE)	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,2,4-Trimethylbenzene	0.70	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,3,5-Trimethylbenzene	0.50	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Naphthalene	ND	1.0		µg/L	5	3/22/2022 5:59:00 PM
1-Methylnaphthalene	ND	2.0		µg/L	5	3/22/2022 5:59:00 PM
2-Methylnaphthalene	ND	2.0		µg/L	5	3/22/2022 5:59:00 PM
Acetone	ND	5.0		µg/L	5	3/22/2022 5:59:00 PM
Bromobenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Bromodichloromethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Bromoform	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Bromomethane	ND	1.0		µg/L	5	3/22/2022 5:59:00 PM
2-Butanone	ND	5.0		µg/L	5	3/22/2022 5:59:00 PM
Carbon disulfide	ND	5.0		µg/L	5	3/22/2022 5:59:00 PM
Carbon tetrachloride	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Chlorobenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Chloroethane	ND	1.0		µg/L	5	3/22/2022 5:59:00 PM
Chloroform	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Chloromethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
2-Chlorotoluene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
4-Chlorotoluene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
cis-1,2-DCE	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
cis-1,3-Dichloropropene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,2-Dibromo-3-chloropropane	ND	1.0		µg/L	5	3/22/2022 5:59:00 PM
Dibromochloromethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Dibromomethane	ND	1.0		µg/L	5	3/22/2022 5:59:00 PM
1,2-Dichlorobenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,3-Dichlorobenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,4-Dichlorobenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Dichlorodifluoromethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,1-Dichloroethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,1-Dichloroethene	ND	0.50		µg/L	5	3/22/2022 5:59:00 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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report
Lab Order **2203B44**
Date Reported: **3/30/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Influent SVE Skid #1
Project: OH Randel 5
Collection Date: 3/21/2022 3:30:00 PM
Lab ID: 2203B44-001 **Matrix:** AIR **Received Date:** 3/22/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
1,2-Dichloropropane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,3-Dichloropropane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
2,2-Dichloropropane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,1-Dichloropropene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Hexachlorobutadiene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
2-Hexanone	ND	5.0		µg/L	5	3/22/2022 5:59:00 PM
Isopropylbenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
4-Isopropyltoluene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
4-Methyl-2-pentanone	ND	5.0		µg/L	5	3/22/2022 5:59:00 PM
Methylene chloride	ND	1.5		µg/L	5	3/22/2022 5:59:00 PM
n-Butylbenzene	ND	1.5		µg/L	5	3/22/2022 5:59:00 PM
n-Propylbenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
sec-Butylbenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Styrene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
tert-Butylbenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Tetrachloroethene (PCE)	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
trans-1,2-DCE	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
trans-1,3-Dichloropropene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,2,3-Trichlorobenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,2,4-Trichlorobenzene	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,1,1-Trichloroethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,1,2-Trichloroethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Trichloroethene (TCE)	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Trichlorofluoromethane	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
1,2,3-Trichloropropane	ND	1.0		µg/L	5	3/22/2022 5:59:00 PM
Vinyl chloride	ND	0.50		µg/L	5	3/22/2022 5:59:00 PM
Xylenes, Total	11	0.75		µg/L	5	3/22/2022 5:59:00 PM
Surr: Dibromofluoromethane	98.6	70-130		%Rec	5	3/22/2022 5:59:00 PM
Surr: 1,2-Dichloroethane-d4	94.4	70-130		%Rec	5	3/22/2022 5:59:00 PM
Surr: Toluene-d8	99.6	70-130		%Rec	5	3/22/2022 5:59:00 PM
Surr: 4-Bromofluorobenzene	99.9	70-130		%Rec	5	3/22/2022 5:59:00 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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report
Lab Order **2203B44**
Date Reported: **3/30/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Influent SVE Skid #2
Project: OH Randel 5
Collection Date: 3/21/2022 3:45:00 PM
Lab ID: 2203B44-002 **Matrix:** AIR
Received Date: 3/22/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	35000	500		µg/L	100	3/24/2022 9:58:56 AM
Surr: BFB	150	15-380		%Rec	100	3/24/2022 9:58:56 AM
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
Benzene	310	5.0		µg/L	50	3/22/2022 3:19:00 PM
Toluene	510	10		µg/L	100	3/22/2022 6:22:00 PM
Ethylbenzene	13	5.0		µg/L	50	3/22/2022 3:19:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,2,4-Trimethylbenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,3,5-Trimethylbenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Naphthalene	ND	10		µg/L	50	3/22/2022 3:19:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	3/22/2022 3:19:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	3/22/2022 3:19:00 PM
Acetone	ND	50		µg/L	50	3/22/2022 3:19:00 PM
Bromobenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Bromoform	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Bromomethane	ND	10		µg/L	50	3/22/2022 3:19:00 PM
2-Butanone	ND	50		µg/L	50	3/22/2022 3:19:00 PM
Carbon disulfide	ND	50		µg/L	50	3/22/2022 3:19:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Chlorobenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Chloroethane	ND	10		µg/L	50	3/22/2022 3:19:00 PM
Chloroform	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Chloromethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	3/22/2022 3:19:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Dibromomethane	ND	10		µg/L	50	3/22/2022 3:19:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	3/22/2022 3:19:00 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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report
Lab Order **2203B44**
Date Reported: **3/30/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Influent SVE Skid #2
Project: OH Randel 5
Collection Date: 3/21/2022 3:45:00 PM
Lab ID: 2203B44-002 **Matrix:** AIR **Received Date:** 3/22/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
1,2-Dichloropropane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,1-Dichloropropene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
2-Hexanone	ND	50		µg/L	50	3/22/2022 3:19:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	3/22/2022 3:19:00 PM
Methylene chloride	ND	15		µg/L	50	3/22/2022 3:19:00 PM
n-Butylbenzene	ND	15		µg/L	50	3/22/2022 3:19:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Styrene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	3/22/2022 3:19:00 PM
Vinyl chloride	ND	5.0		µg/L	50	3/22/2022 3:19:00 PM
Xylenes, Total	120	7.5		µg/L	50	3/22/2022 3:19:00 PM
Surr: Dibromofluoromethane	97.0	70-130		%Rec	50	3/22/2022 3:19:00 PM
Surr: 1,2-Dichloroethane-d4	89.9	70-130		%Rec	50	3/22/2022 3:19:00 PM
Surr: Toluene-d8	104	70-130		%Rec	50	3/22/2022 3:19:00 PM
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	50	3/22/2022 3:19:00 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 Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix interference		

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ANALYTICAL SUMMARY REPORT

March 25, 2022

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

Work Order: G22030400

Project Name: Not Indicated

Energy Laboratories Inc. Gillette WY received the following 2 samples for Hall Environmental on 3/23/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G22030400-001	2203B44-001B; Influent SVE Skid #1	03/21/22 15:30	03/23/22	Air	Natural Gas Analysis - BTU Natural Gas Analysis - Compressibility Factor Natural Gas Analysis - GPM Natural Gas Analysis - Molecular Weight Natural Gas Analysis - Routine Natural Gas Analysis - Pressure Base Natural Gas Analysis - Psuedo-Critical Pressure Natural Gas Analysis - Psuedo-Critical Temperature Natural Gas Analysis - Specific Gravity Natural Gas Analysis - Temperature Base
G22030400-002	2203B44-002B; Influent SVE Skid #2	03/21/22 15:45	03/23/22	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, 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 tests results, please contact your Project Manager.

Report Approved By:

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LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Hall Environmental
Project: Not Indicated
Client Sample ID: 2203B44-001B; Influent SVE Skid #1
Location:
Lab ID: G22030400-001

Report Date: 03/25/22
Collection Date: 03/21/22 15:30
Date Received: 03/23/22
Sampled By: Not Indicated

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT					
Oxygen	22.375	Mol %		GPA 2261	03/24/22 15:16 / blb
Nitrogen	77.584	Mol %		GPA 2261	03/24/22 15:16 / blb
Carbon Dioxide	0.041	Mol %		GPA 2261	03/24/22 15:16 / blb
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
Methane	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
Ethane	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
Propane	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
Isobutane	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
n-Butane	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
Isopentane	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
n-Pentane	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
Hexanes plus	< 0.001	Mol %		GPA 2261	03/24/22 15:16 / blb
GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS					
GPM Ethane	< 0.0003	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM Propane	< 0.0003	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM Isobutane	< 0.0003	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM n-Butane	< 0.0003	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM Isopentane	< 0.0004	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM n-Pentane	< 0.0004	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM Hexanes plus	< 0.0004	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM Pentanes plus	< 0.0004	gal/MCF		GPA 2261	03/24/22 15:16 / blb
GPM Total	< 0.0004	gal/MCF		GPA 2261	03/24/22 15:16 / blb
CALCULATED PROPERTIES					
Calculation Pressure Base	14.730	psia		GPA 2261	03/24/22 15:16 / blb
Calculation Temperature Base	60	°F		GPA 2261	03/24/22 15:16 / blb
Compressibility Factor, Z	1.0000	unitless		GPA 2261	03/24/22 15:16 / blb
Molecular Weight	28.91	unitless		GPA 2261	03/24/22 15:16 / blb
Pseudo-critical Pressure, psia	547	psia		GPA 2261	03/24/22 15:16 / blb
Pseudo-critical Temperature, deg R	239	deg R		GPA 2261	03/24/22 15:16 / blb
Specific Gravity (air=1.000)	1.001	unitless		GPA 2261	03/24/22 15:16 / blb
Gross BTU per cu ft @ std cond, dry	< 0.01	BTU/cu ft		GPA 2261	03/24/22 15:16 / blb
Gross BTU per cu ft @ std cond, wet	< 0.01	BTU/cu ft		GPA 2261	03/24/22 15:16 / blb

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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LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Hall Environmental
Project: Not Indicated
Client Sample ID: 2203B44-002B; Influent SVE Skid #2
Location:
Lab ID: G22030400-002

Report Date: 03/25/22
Collection Date: 03/21/22 15:45
Date Received: 03/23/22
Sampled By: Not Indicated

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT					
Oxygen	21.807	Mol %		GPA 2261	03/24/22 15:31 / blb
Nitrogen	77.508	Mol %		GPA 2261	03/24/22 15:31 / blb
Carbon Dioxide	0.310	Mol %		GPA 2261	03/24/22 15:31 / blb
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	03/24/22 15:31 / blb
Methane	< 0.001	Mol %		GPA 2261	03/24/22 15:31 / blb
Ethane	< 0.001	Mol %		GPA 2261	03/24/22 15:31 / blb
Propane	0.001	Mol %		GPA 2261	03/24/22 15:31 / blb
Isobutane	0.005	Mol %		GPA 2261	03/24/22 15:31 / blb
n-Butane	0.018	Mol %		GPA 2261	03/24/22 15:31 / blb
Isopentane	0.035	Mol %		GPA 2261	03/24/22 15:31 / blb
n-Pentane	0.040	Mol %		GPA 2261	03/24/22 15:31 / blb
Hexanes plus	0.276	Mol %		GPA 2261	03/24/22 15:31 / blb
GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS					
GPM Ethane	< 0.0003	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM Propane	< 0.0003	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM Isobutane	0.0020	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM n-Butane	0.0060	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM Isopentane	0.0130	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM n-Pentane	0.0140	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM Hexanes plus	0.1200	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM Pentanes plus	0.1470	gal/MCF		GPA 2261	03/24/22 15:31 / blb
GPM Total	0.1550	gal/MCF		GPA 2261	03/24/22 15:31 / blb
CALCULATED PROPERTIES					
Calculation Pressure Base	14.730	psia		GPA 2261	03/24/22 15:31 / blb
Calculation Temperature Base	60	°F		GPA 2261	03/24/22 15:31 / blb
Compressibility Factor, Z	1.0000	unitless		GPA 2261	03/24/22 15:31 / blb
Molecular Weight	29.15	unitless		GPA 2261	03/24/22 15:31 / blb
Pseudo-critical Pressure, psia	547	psia		GPA 2261	03/24/22 15:31 / blb
Pseudo-critical Temperature, deg R	242	deg R		GPA 2261	03/24/22 15:31 / blb
Specific Gravity (air=1.000)	1.010	unitless		GPA 2261	03/24/22 15:31 / blb
Gross BTU per cu ft @ std cond, dry	18.00	BTU/cu ft		GPA 2261	03/24/22 15:31 / blb
Gross BTU per cu ft @ std cond, wet	17.68	BTU/cu ft		GPA 2261	03/24/22 15:31 / blb

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 Gillette, WY Branch

Client: Hall Environmental **Work Order:** G22030400 **Report Date:** 03/25/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **GPA 2261**									Analytical Run: R270004
Lab ID: **CCV-2203241254**	Continuing Calibration Verification Standard								03/24/22 12:55
Oxygen	0.637	Mol %	0.001	106	90	110			
Nitrogen	1.378	Mol %	0.001	98	85	110			
Carbon Dioxide	0.954	Mol %	0.001	95	90	110			
Hydrogen Sulfide	0.025	Mol %	0.001	100	70	130			
Methane	93.438	Mol %	0.001	100	90	110			
Ethane	1.014	Mol %	0.001	101	90	110			
Propane	1.009	Mol %	0.001	101	90	110			
Isobutane	0.495	Mol %	0.001	99	90	110			
n-Butane	0.495	Mol %	0.001	99	90	110			
Isopentane	0.200	Mol %	0.001	100	90	110			
n-Pentane	0.201	Mol %	0.001	100	90	110			
Hexanes plus	0.154	Mol %	0.001	103	90	110			
Lab ID: **ICV-2203241303**	Initial Calibration Verification Standard								03/24/22 13:04
Oxygen	0.391	Mol %	0.001	97	75	110			
Nitrogen	5.154	Mol %	0.001	103	90	110			
Carbon Dioxide	4.900	Mol %	0.001	99	90	110			
Hydrogen Sulfide	0.130	Mol %	0.001	131	100	136			
Methane	73.196	Mol %	0.001	100	90	110			
Ethane	4.997	Mol %	0.001	101	90	110			
Propane	4.993	Mol %	0.001	100	90	110			
Isobutane	1.984	Mol %	0.001	99	90	110			
n-Butane	1.965	Mol %	0.001	98	90	110			
Isopentane	0.986	Mol %	0.001	99	90	110			
n-Pentane	0.997	Mol %	0.001	100	90	110			
Hexanes plus	0.307	Mol %	0.001	102	90	110			
Lab ID: **CCV-2203241628**	Continuing Calibration Verification Standard								03/24/22 16:28
Oxygen	0.609	Mol %	0.001	102	90	110			
Nitrogen	1.288	Mol %	0.001	92	85	110			
Carbon Dioxide	0.965	Mol %	0.001	97	90	110			
Hydrogen Sulfide	0.021	Mol %	0.001	84	70	130			
Methane	93.560	Mol %	0.001	100	90	110			
Ethane	1.015	Mol %	0.001	101	90	110			
Propane	1.006	Mol %	0.001	101	90	110			
Isobutane	0.492	Mol %	0.001	98	90	110			
n-Butane	0.492	Mol %	0.001	98	90	110			
Isopentane	0.199	Mol %	0.001	99	90	110			
n-Pentane	0.200	Mol %	0.001	100	90	110			
Hexanes plus	0.153	Mol %	0.001	102	90	110			
Method: **GPA 2261**									Batch: R270004
Lab ID: **G22030400-001ADUP**	Sample Duplicate				Run: Varian GC_220324A				03/24/22 15:25
Oxygen	22.373	Mol %	0.001				0.0	10	

Qualifiers:

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QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental **Work Order:** G22030400 **Report Date:** 03/25/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261									Batch: R270004
Lab ID: G22030400-001ADUP	Sample Duplicate				Run: Varian GC_220324A				03/24/22 15:25
Nitrogen	77.587	Mol %	0.001				0.0	10	
Carbon Dioxide	0.040	Mol %	0.001				2.5	10	
Hydrogen Sulfide	< 0.001	Mol %	0.001					10	
Methane	< 0.001	Mol %	0.001					10	
Ethane	< 0.001	Mol %	0.001					10	
Propane	< 0.001	Mol %	0.001					10	
Isobutane	< 0.001	Mol %	0.001					10	
n-Butane	< 0.001	Mol %	0.001					10	
Isopentane	< 0.001	Mol %	0.001					10	
n-Pentane	< 0.001	Mol %	0.001					10	
Hexanes plus	< 0.001	Mol %	0.001					10	
Lab ID: G22030400-002ADUP	Sample Duplicate				Run: Varian GC_220324A				03/24/22 15:36
Oxygen	21.803	Mol %	0.001				0.0	10	
Nitrogen	77.501	Mol %	0.001				0.0	10	
Carbon Dioxide	0.310	Mol %	0.001				0.0	10	
Hydrogen Sulfide	< 0.001	Mol %	0.001					10	
Methane	< 0.001	Mol %	0.001					10	
Ethane	< 0.001	Mol %	0.001					10	
Propane	0.001	Mol %	0.001				0.0	10	
Isobutane	0.005	Mol %	0.001				0.0	10	
n-Butane	0.018	Mol %	0.001				0.0	10	
Isopentane	0.035	Mol %	0.001				0.0	10	
n-Pentane	0.040	Mol %	0.001				0.0	10	
Hexanes plus	0.287	Mol %	0.001				3.9	10	

Qualifiers:

RL - Analyte Reporting Limit

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Work Order Receipt Checklist

Hall Environmental

G22030400

Login completed by: Jill S. Jeffress
Date Received: 3/23/2022
Reviewed by: Misty Stephens
Received by: csj
Reviewed Date: 3/24/2022
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:	°C		
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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

SUB CONTRATOR: Energy Labs-Gillette	COMPANY: Energy Laboratories	PHONE: (866) 686-7175	FAX:
ADDRESS: 400 W Boxelder Rd		ACCOUNT #	EMAIL:
CITY, STATE, ZIP: Gillette, WY 82718			

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2203B44-001B	Influent SVE Skid #1	TEDLAR	Air	3/21/2022 3 30:00 PM	1	Natural Gases O2, CO2
2	2203B44-002B	Influent SVE Skid #2	TEDLAR	Air	3/21/2022 3 45:00 PM	1	Natural Gases O2, CO2

6220 30400

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: 3/22/2022	Time: 8:56 AM	Received By: M. Ray	Date: 03/23/2023	Time: 1030
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ☑ RUSH: Next BD ☐ 2nd BD ☐ 3rd BD ☐

REPORT TRANSMITTAL DESIRED

☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples: _____ °C Attempt to Cool ? _____

Comments: _____

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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: 2203B44 RcptNo: 1

Received By: Cheyenne Cason 3/22/2022 7:15:00 AM

Completed By: Sean Livingston 3/22/2022 8:44:56 AM

Reviewed By: KDG 3/22/22

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? (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: TN 3/22/22

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	NA	Good				

Chain-of-Custody Record

Client: Hilcorp Energy Co
Attn: Kate Kaufman
Mailing Address:
Phone #:
email or Fax#:
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: OH Randel #5
Project #:
Project Manager: WSP-Devin Hencmann, Danny Burns
Sampler: D. Burns
On Ice: ☐ Yes ☒ No
# of Coolers: 1
Cooler Temp(including CF): N/A (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2203844	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) Full 8260	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Fixed Gas O_2, CO_2
3-21-22	1530	Air	Influent SVE Skid #1	2-Tedlar	NA	001		X						X			X
3/21/22	1545	Air	Influent SVE Skid #2	2-Tedlar	NA	002		X						X			X

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
3-21-22	1650				3/21/22	1650
3/21/22	1810			Courier	3/22/22	0715

Remarks:
cc: devin.hencmann@wsp.com
danny.burns@wsp.com
seal intact

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 98721

CONDITIONS

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 98721
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See App ID 125248 for most updated status.	9/22/2022