

NV



# ENSOLUM

October 25, 2023

New Mexico Oil Conservation Division – District III  
New Mexico Energy, Mineral, and Natural Resources Department  
1000 Rio Brazos Road  
Aztec, New Mexico 87410

**Subject: 2023 Third Quarter – Solar SVE System Update**  
**Trunk L Tank Battery**  
**Harvest Four Corners, LLC**  
Incident Number NVF1900731813  
Remediation Permit Number 3RP-13665  
Rio Arriba County, New Mexico

To Whom It May Concern:

Ensolum, LLC (Ensolum), on behalf of Harvest Four Corners, LLC (Harvest), presents the following *2023 Third Quarter – Solar SVE System Update* report summarizing the soil vapor extraction (SVE) system performance at the Trunk L Tank Battery (Site), located in Unit A of Section 28, Township 28 North, Range 05 West, in Rio Arriba County, New Mexico (Figure 1).

## BACKGROUND

The solar SVE system was installed on September 18, 2019, to remediate subsurface impacts following a release on December 14, 2018. Excessive liquids were released onto the Site during a pigging event. Additionally, the volume of fluid in the slug catcher was elevated due to a stuck float valve, causing a release of approximately 22 barrels (bbls) into the lined secondary containment. Harvest reported the release to the New Mexico Oil Conservation Division (NMOCD) on a release Notification and Corrective Action Form C-141 on December 28, 2018, and the event was assigned Incident Number NVF1900731813. A solar SVE system was installed to remediate impacts resulting from the release. Reports summarizing remediation system operation for previous quarters of system operation have been submitted to the NMOCD.

## SOLAR SVE SYSTEM OPERATION AND MONITORING

The solar SVE system consists of three shallow wells (SVE01, SVE03, and SVE05) with depths ranging from 15 feet to 20 feet below ground surface (bgs) with ten 10-foot screened intervals, and three deep wells (SVE02, SVE04, and SVE06) with depths ranging from 35 feet to 40 feet bgs with 10-foot screened intervals. The solar SVE system is comprised of a 2.75 horsepower, three-phase blower capable of extracting 105 cubic feet per minute (cfm) at 50 inches of water column (IWC) vacuum, with a maximum vacuum capability of 84 IWC. Each SVE well has a dedicated leg with an adjustable valve and vacuum gauge to control the individual flow rates and vacuum prior to manifolding together before the water knockout tank and blower. Harvest utilized a solar-powered SVE system due to the remote location and the lack of electrical grid power at the Site. The direct-drive blower motor is connected to the solar panels via a motor controller that automatically starts the system as sunlight is available and throttles the blower up as sun power increases throughout the day to maximize efficiency. Seasonally, there are approximately 10 hours in the winter and 12 hours in the summer of available solar power in Farmington, New Mexico. The complete solar SVE system is constructed as one unit designed for utilization at off-

Harvest Four Corners, LLC  
Trunk L Tank Battery

grid locations and operates autonomously. The layout of the solar SVE system is depicted on Figure 2.

Between startup of the solar SVE system on September 18, 2019, and the last quarterly Site visit on September 22, 2023, there have been 1,465 days of operation, with an estimated 17,154 total hours of nominal daylight available for solar SVE system operations. A photographic log of the hours meter reading is included as Appendix A. Since installation, the system had an actual runtime of 17,697 hours, for an overall uptime of 103.2 percent (%) of the available runtime hours. Below is a table showing SVE system runtime in comparison with nominal available daylight hours per month, according to the National Renewable Energy Laboratory (NREL).

### SVE System Runtime

Time Period	Start up July 16, 2020 to March 15, 2023	June 22, 2023 to June 30, 2023	July 1, 2023 to July 31, 2023	August 1, 2023 to August 31, 2023	September 1, 2023 to September 20, 2023
Days	1071	9	31	31	20
Avg. Nominal Daylight Hours	11.58	14	14	13	12
Available Runtime Hours	12,402	126	434	403	240
<b>Total Available Daylight Runtime Hours</b>					<b>13,605</b>
<b>Actual Runtime Hours</b>					<b>13,993</b>
<b>Cumulative % Runtime</b>					<b>102.9%</b>
<b>Quarterly Available Daylight Runtime Hours</b>					<b>1,203</b>
<b>Quarterly Runtime Hours</b>					<b>1,214</b>
<b>Quarterly % Runtime</b>					<b>100.9%</b>

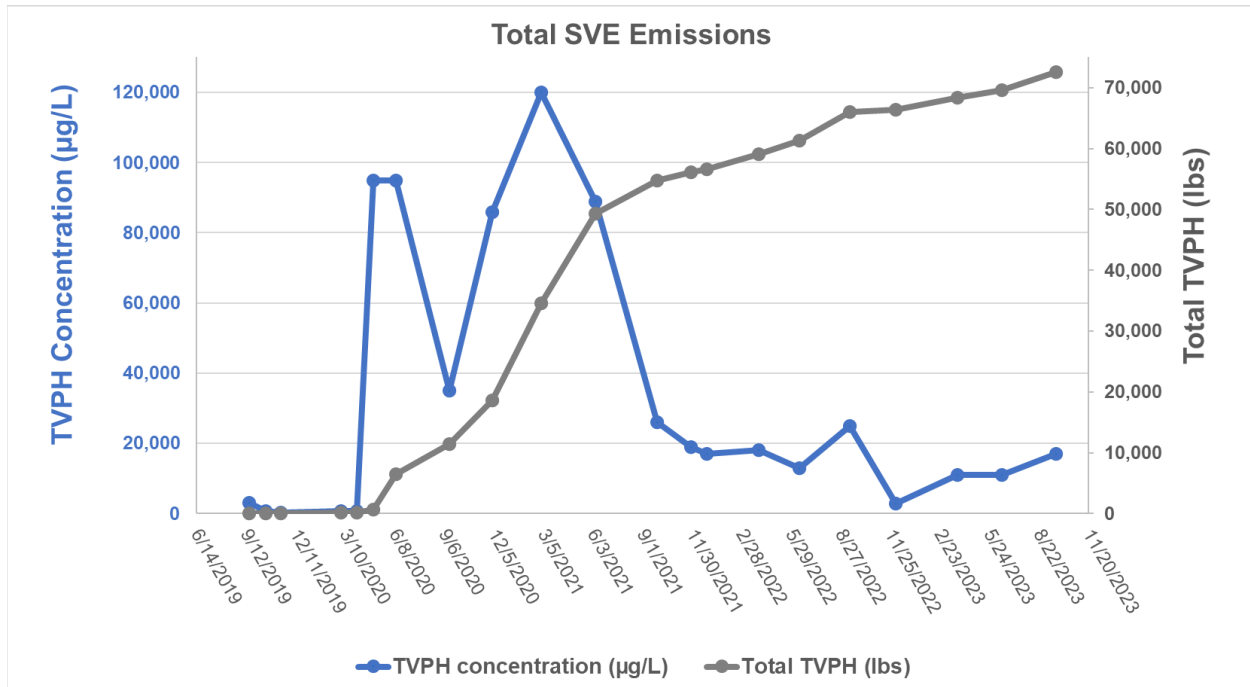
### AIR EMISSIONS MONITORING

An initial air sample was collected on September 18, 2019, from the influent side of the blower on the SVE system. Subsequent air samples were collected quarterly with the most recent sample collected September 22, 2023 (Table 1). Samples were collected in 1-Liter Tedlar® bags via a high vacuum air sampler and submitted to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico, for analyses of benzene, toluene, ethylbenzene, and total xylenes (BTEX) following United States Environmental Protection Agency (EPA) Method 8021B and total volatile petroleum hydrocarbons (TVPH) following EPA Method 8015D. The laboratory analytical report from the September 2023 sampling event is included as Appendix B.

Estimated air emissions were calculated using air sample data collected to date (Table 2). The impacted mass source removal via the solar SVE system to-date is estimated to be 72,564 pounds (lbs) (or 36.28 tons) of TVPH. An increase in TVPH mass removal was observed in May 2020 as a result of system optimization, through focusing system operation on the four SVE wells that were recovering vapor with the highest photoionization detector (PID) measurements (SVE03, SVE04, SVE05, and SVE06). After the reconfiguration in May 2020, there was a peak TVPH inlet concentration in March 2021 of 120,000 micrograms per liter (µg/L). From March 2021 to December 2022, mass removal declined significantly. Since December 2022, mass removal has increased slightly, as seen in the graph below, due to system repairs and optimization.

In July 2023, system repairs were made, and operation was adjusted to focus on wells SVE02, SVE03, SVE04, SVE05, and SVE06. Operation on these five wells continued through September 2023.

Harvest Four Corners, LLC  
Trunk L Tank Battery



**Notes:**

TVPH – total volatile petroleum hydrocarbons  
µg/L – micrograms per liter  
lbs – pounds

The September 2023 TVPH emissions rate increased to approximately 2.23 pounds per hour (lbs/hr) or approximately 29.55 pounds per day, based on the average nominal daylight hours available, indicating that the SVE system is still effectively remediating the Site. The mass removal rate will continue to be monitored to evaluate system effectiveness.

### PLAN FOR NEXT QUARTER OF OPERATION

During the upcoming fourth quarter 2023 operations, Ensolum will continue to visit the Site monthly to ensure a minimum of 90% runtime efficiency continues and that any maintenance issues are addressed in a timely manner. An air sample will be collected in the fourth quarter and analyzed for BTEX and TVPH. An updated quarterly report with sample results, runtime, and mass source removal will be submitted by January 31, 2024.

Quarterly air sampling and reporting will continue until the mass removal rate declines to an asymptotic level and indicates hydrocarbon impacts have been reduced at the Site to the maximum extent practicable. At that time, Ensolum will conduct additional soil sampling to investigate potential residual impacts and request closure if concentrations of BTEX and TPH are below the applicable Table I Closure Criteria as detailed in the approved *Remediation Work Plan*, dated May 28, 2019.

If the final delineation samples indicate hydrocarbon impacts have been remediated with chemicals of concern concentrations in compliance with the Table 1 Closure Criteria, Ensolum will present the confirmation laboratory analysis data in a report and request closure of the release. Should the results indicate analytes in the soil exceed the Table I Closure Criteria, Ensolum will either make operational adjustments and restart the SVE system based on the results of the investigation or develop an alternative remedial approach to reach Site closure.

Harvest Four Corners, LLC  
Trunk L Tank Battery

Ensolum appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this update, do not hesitate to contact Danny Burns at (303) 601-1420 or via email at [dburns@ensolum.com](mailto:dburns@ensolum.com) or Jennifer Deal at (505) 324-5128 or at [jdeal@harvestmidstream.com](mailto:jdeal@harvestmidstream.com).

Sincerely,

**ENSOLUM, LLC**



Reece Hanson  
Staff Geologist



Danny Burns  
Senior Geologist

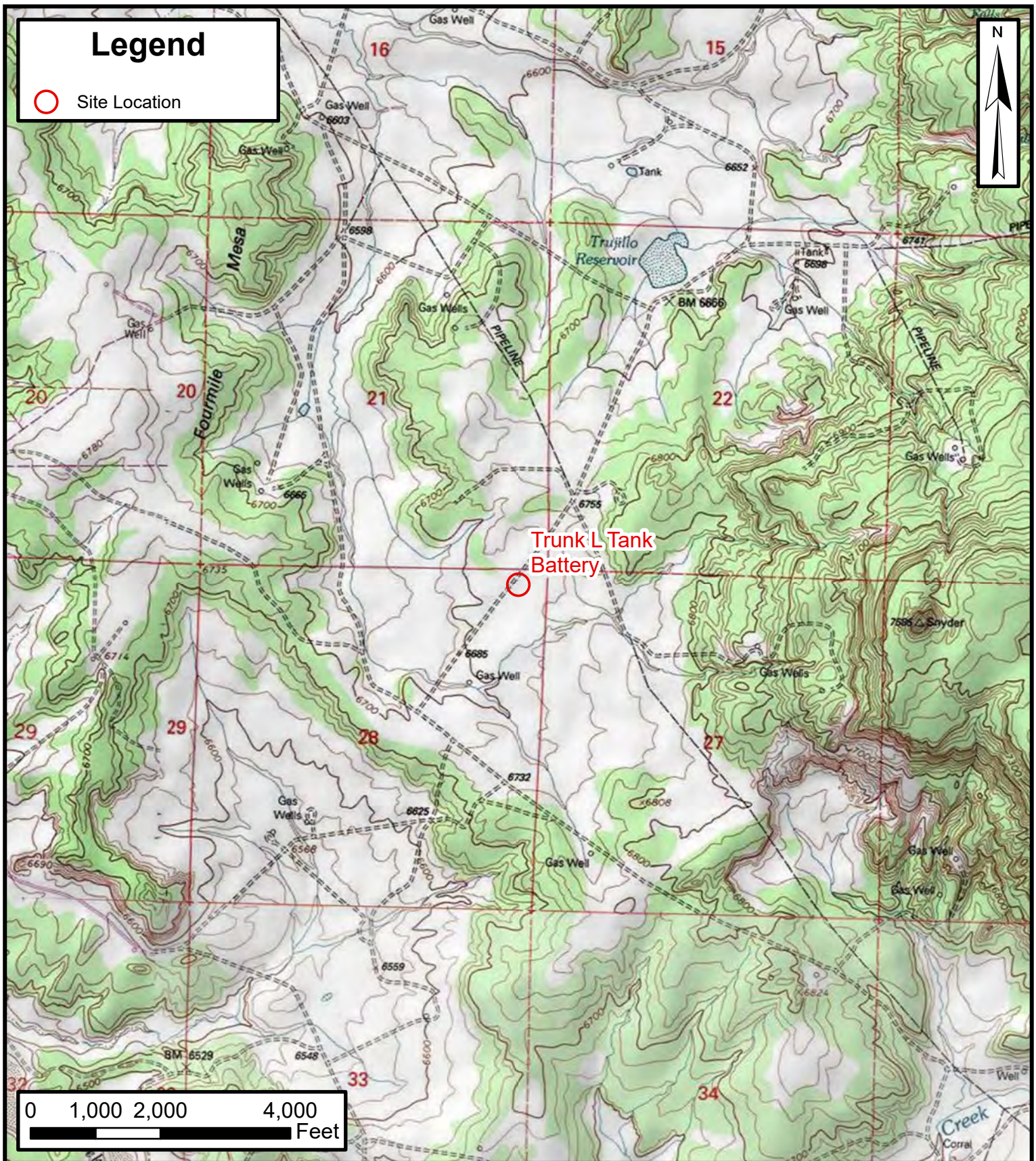
## APPENDICES

Figure 1 – Site Location Map  
Figure 2 – SVE System Layout  
Table 1 – SVE System Emissions Analytical Results  
Table 2 – SVE Mass Removal & Emissions Summary  
Appendix A – Photographic Log  
Appendix B – Laboratory Analytical Report



FIGURES





## Site Location Map

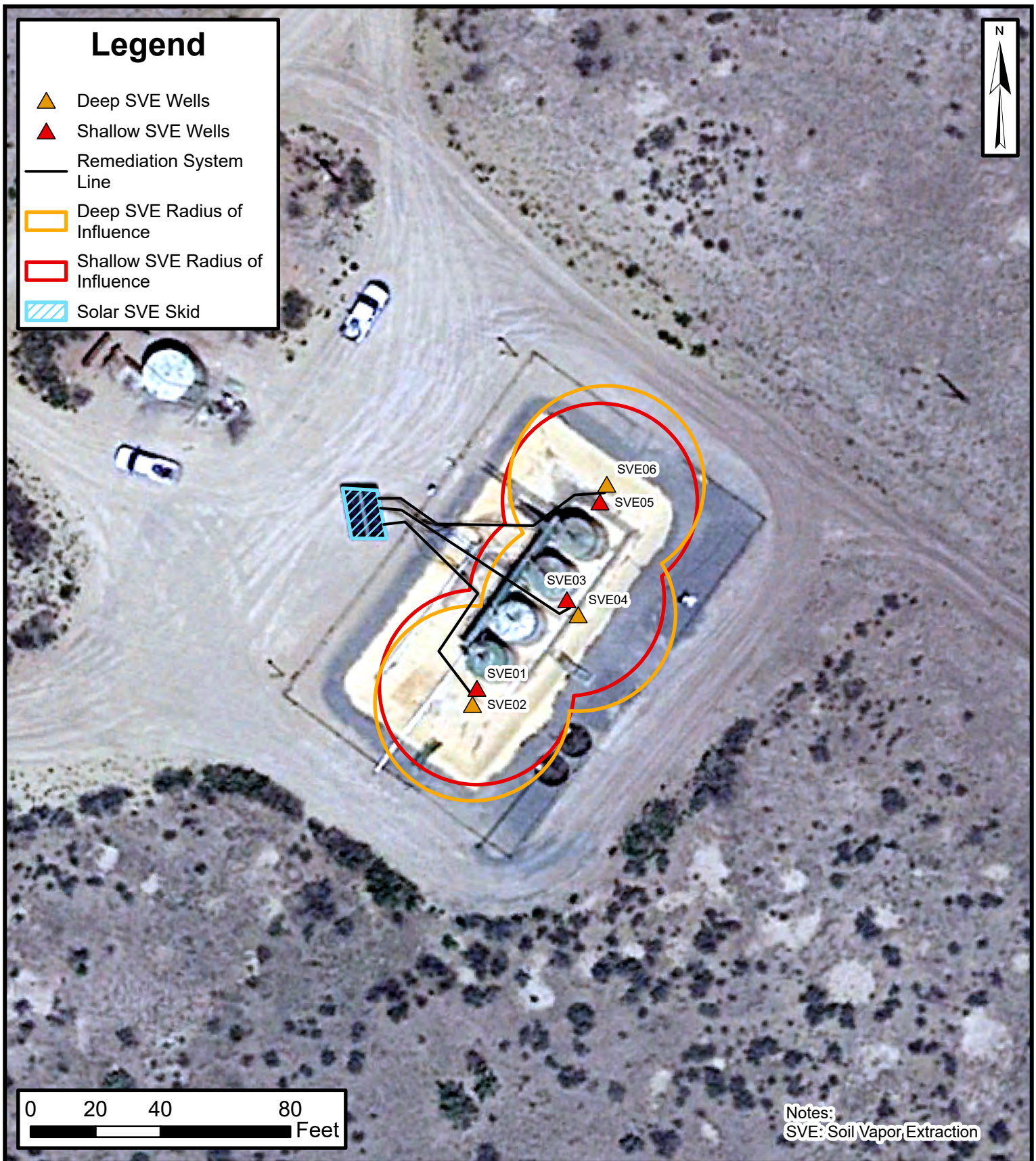
Trunk L Tank Battery  
 Harvest Four Corners, LLC  
 36.638705, -107.357047  
 Rio Arriba County, New Mexico

FIGURE

1

**ENSOLUM**  
 Environmental, Engineering and  
 Hydrogeologic Consultants





## SVE System Layout

Trunk L Tank Battery  
Harvest Four Corners, LLC  
36.638705, -107.357047  
Rio Arriba County, New Mexico

FIGURE  
2



TABLES





**TABLE 1**  
**SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS**  
 Trunk L Tank Battery  
 Harvest Four Corners, LLC  
 Rio Arriba County, New Mexico

Date	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)
9/18/2019	946	1,000	1,500	50	550	NA
10/18/2019	931	250	410	6.5	74	NA
11/14/2019	578	1.8	4.3	0.19	1.7	250
3/3/2020	868	3.9	22	1.3	13	760
5/1/2020	913	610	1,500	58	570	95,000
6/10/2020	1,527	640	1,600	56	530	95,000
9/15/2020	1,077	180	840	24	230	35,000
12/2/2020	1,320	380	1,100	23	270	86,000
3/1/2021	1,469	440	2,100	110	1,100	120,000
6/8/2021	1,380	300	1,200	42	380	89,000
9/28/2021	916	150	230	<10	49	26,000
11/29/2021	573	78	280	9.1	84	19,000
12/27/2021	NA	120	240	<5.0	47	17,000
3/31/2022	406	76	210	5.5	47	18,000
6/13/2022	736	65	190	<5.0	51	13,000
9/13/2022	1,640	62	170	<5.0	33	25,000
12/5/2022	4,561	15	54	<5.0	13	2,900
3/28/2023	1,296	27	89	5.8	57	11,000
6/16/2023	1,263	22	63	<5.0	39	11,000
9/22/2023	1,238	47	160	5.1	110	17,000

**Notes:**

NA: Not analyzed

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

GRO: gasoline range organics

TVPH: total volatile petroleum hydrocarbons

*Italics denote that the laboratory method detection limit was reported*



**TABLE 2**  
**SOIL VAPOR EXTRACTION MASS REMOVAL AND EMISSIONS**  
 Trunk L Tank Battery  
 Harvest Four Corners, LLC  
 Rio Arriba 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)
9/18/2019*	1,435	1,000	1,500	50	550	3,013
10/18/2019*	931	250	410	6.5	74	744
11/14/2019	578	1.8	4.3	0.19	1.7	250
3/3/2020	868	3.9	22	1.3	13	760
4/1/2020**	838	3.7	21	1.2	12	733
5/1/2020	913	610	1,500	58	570	95,000
6/10/2020	1,527	640	1,600	56	530	95,000
9/15/2020	1,077	180	840	24	230	35,000
12/2/2020	1,320	380	1,100	23	270	86,000
3/1/2021	1,469	440	2,100	110	1,100	120,000
6/8/2021	1,380	300	1,200	42	380	89,000
9/28/2021	916	150	230	10	49	26,000
11/29/2021	573	78	280	9.1	84	19,000
12/27/2021	—	120	240	5.0	47	17,000
3/31/2022	406	76	210	5.5	47	18,000
6/13/2022	736	65	190	5.0	51	13,000
9/13/2022	1,640	62	170	5.0	33	25,000
12/5/2022	4,561	15	54	5.0	13	2,900
3/28/2023	1,296	27	89	5.8	57	11,000
6/16/2023	1,263	22	63	5.0	39	11,000
9/22/2023	1,238	47	160	5.1	110	17,000
<b>Average</b>	1,248	213	571	21	203	32,638

**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)
9/18/2019	33.7	3,033	3,033	0.1262	0.1892	0.0063	0.0694	0.3801
10/18/2019	37.8	723,303	720,270	0.0353	0.0579	0.0009	0.0105	0.1051
11/14/2019	38.0	1,334,343	611,040	0.0003	0.0006	0.0000	0.0002	0.0356
3/3/2020	21.3	2,898,866	1,564,523	0.0003	0.0018	0.0001	0.0010	0.0605
4/1/2020	21.3	3,795,613	896,747	0.0003	0.0017	0.0001	0.0010	0.0583
5/1/2020	39.2	3,882,637	87,024	0.0895	0.2201	0.0085	0.0836	13.9404
6/10/2020	29.3	4,869,885	987,248	0.0703	0.1757	0.0061	0.0582	10.4304
9/15/2020	27.8	7,089,263	2,219,378	0.0187	0.0873	0.0025	0.0239	3.6384
12/2/2020	26.6	8,447,393	1,358,130	0.0379	0.1097	0.0023	0.0269	8.5730
3/1/2021	40.0	10,571,393	2,124,000	0.0659	0.3144	0.0165	0.1647	17.9683
6/8/2021	34.2	13,226,681	2,655,288	0.0384	0.1536	0.0054	0.0486	11.3941
9/28/2021	37.0	16,596,641	3,369,960	0.0208	0.0319	0.0014	0.0068	3.6011
11/29/2021	28.7	17,746,416	1,149,775	0.0084	0.0301	0.0010	0.0090	2.0434
12/27/2021	30.4	18,233,905	487,489	0.0137	0.0273	0.0006	0.0054	1.9365
3/31/2022	36.0	20,402,545	2,168,640	0.0102	0.0283	0.0007	0.0063	2.4257
6/13/2022	46.0	23,209,465	2,806,920	0.0112	0.0327	0.0009	0.0088	2.2385
9/13/2022	40.0	26,214,265	3,004,800	0.0093	0.0255	0.0007	0.0049	3.7434
12/5/2022	31.0	27,901,285	1,687,020	0.0017	0.0063	0.0006	0.0015	0.3365
3/28/2023	42.0	30,864,805	2,963,520	0.0042	0.0140	0.0009	0.0090	1.7294
6/16/2023	27.0	32,607,925	1,743,120	0.0022	0.0064	0.0005	0.0039	1.1118
9/22/2023	35.0	35,415,625	2,807,700	0.0062	0.0210	0.0007	0.0144	2.2273
<b>Average</b>				0.03	0.07	0.003	0.03	4.19



**TABLE 2**  
**SOIL VAPOR EXTRACTION MASS REMOVAL AND EMISSIONS**  
 Trunk L Tank Battery  
 Harvest Four Corners, LLC  
 Rio Arriba County, New Mexico

Flow and Laboratory Analysis

Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
9/18/2019	1.5	1.5	0.2	0.3	0.0	0.1	0.6	0.000
10/18/2019	319.5	318	11.2	18.4	0.3	3.3	33.4	0.017
11/14/2019	587.5	268	0.1	0.2	0.0	0.1	9.5	0.005
3/3/2020	1,814	1,226.5	0.4	2.1	0.1	1.3	74.2	0.037
4/1/2020	2,517	703	0.2	1.2	0.1	0.7	41.0	0.021
5/1/2020	2,554	37	3.3	8.1	0.3	3.1	515.8	0.258
6/10/2020	3,115	561	39.4	98.6	3.4	32.6	5,851	2.926
9/15/2020	4,447	1,332	24.9	116.3	3.3	31.8	4,846	2.423
12/2/2020	5,297	850	32.2	93.2	1.9	22.9	7,287	3.644
3/1/2021	6,182	885	58.3	278.3	14.6	145.8	15,902	7.951
6/8/2021	7,476	1,294	49.7	198.8	7.0	63.0	14,744	7.372
9/28/2021	8,994	1,518	31.5	48.4	2.1	10.3	5,467	2.733
11/29/2021	9,661	667	5.6	20.1	0.7	6.0	1,363	0.681
12/27/2021	9,928	267	3.6	7.3	0.2	1.4	517.0	0.259
3/31/2022	10,932	1,004	10.3	28.4	0.7	6.4	2,435	1.218
6/13/2022	11,949	1,017	11.4	33.3	0.9	8.9	2,277	1.138
9/13/2022	13,201	1,252	11.6	31.9	0.9	6.2	4,687	2.343
12/5/2022	14,108	907	1.6	5.7	0.5	1.4	305	0.153
3/28/2023	15,284	1,176	5.0	16.5	1.1	10.5	2,034	1.017
6/16/2023	16,360	1,076	2.4	6.9	0.5	4.2	1,196	0.598
9/22/2023	17,697	1,337	8.2	28.0	0.9	19.3	2,978	1.489
<b>Total Mass Recovery to Date</b>			311.2	1,041.8	39.6	379.3	72,563.8	36.3

**Notes:**

\* - TVPH data extrapolated from PID values

\*\* - Analytical data extrapolated from PID values

BTEX - benzene, toluene, ethylbenzene, total xylenes

cf - cubic feet

cfm - cubic feet per minute

lbs - pounds

lb/hr - pounds per hour

µg/L - microgram per liter

PID - photoionization detector

ppm - parts per million

TVPH - total volatile petroleum hydrocarbons

VOC - volatile organic compounds

VOC Mass Removed (lbs) = Influent VOCs (mg/m<sup>3</sup>) \* Air Flow Rates (cfm) \* (1 m<sup>3</sup>/35.3147 ft<sup>3</sup>) \* (1 lb/453,592 mg) \* Time Period (min)

*Italics denote that the laboratory method detection limit was used for calculations for a non-detected result*





## APPENDIX A

### Photographic Log



Photographic Log  
Trunk L Tank  
Battery  
Harvest Four Corners,  
LLC  
Rio Arriba County,  
New Mexico

Photo #1  
SVE Hours Reading 7/24/2023





Photographic Log  
Trunk L Tank  
Battery  
Harvest Four Corners,  
LLC  
Rio Arriba County,  
New Mexico

Photo #2  
SVE Hours Reading 8/28/2023







Photographic Log  
Trunk L Tank  
Battery  
Harvest Four Corners,  
LLC  
Rio Arriba County,  
New Mexico

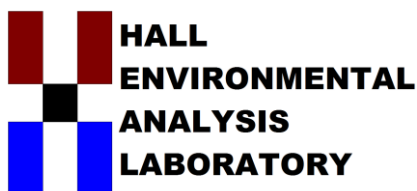
Photo #3  
SVE Hours Reading 9/22/2023





## APPENDIX B

### Laboratory Analytical Report



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

October 03, 2023

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

RE: Trunk L

OrderNo.: 2309D12

Dear Mitch Killough:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/23/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

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

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109



## Analytical Report

Lab Order 2309D12

Date Reported: 10/3/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Trunk L Influent

Project: Trunk L

Collection Date: 9/22/2023 1:20:00 PM

Lab ID: 2309D12-001

Matrix: AIR

Received Date: 9/23/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260B: VOLATILES</b>						Analyst: CCM
Benzene	47	5.0		µg/L	50	9/25/2023 3:37:00 PM
Toluene	160	5.0		µg/L	50	9/25/2023 3:37:00 PM
Ethylbenzene	5.1	5.0		µg/L	50	9/25/2023 3:37:00 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2,4-Trimethylbenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,3,5-Trimethylbenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Naphthalene	ND	10		µg/L	50	9/25/2023 3:37:00 PM
1-Methylnaphthalene	ND	20		µg/L	50	9/25/2023 3:37:00 PM
2-Methylnaphthalene	ND	20		µg/L	50	9/25/2023 3:37:00 PM
Acetone	ND	50		µg/L	50	9/25/2023 3:37:00 PM
Bromobenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Bromodichloromethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Bromoform	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Bromomethane	ND	10		µg/L	50	9/25/2023 3:37:00 PM
2-Butanone	ND	50		µg/L	50	9/25/2023 3:37:00 PM
Carbon disulfide	ND	50		µg/L	50	9/25/2023 3:37:00 PM
Carbon tetrachloride	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Chlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Chloroethane	ND	10		µg/L	50	9/25/2023 3:37:00 PM
Chloroform	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Chloromethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
2-Chlorotoluene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
4-Chlorotoluene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
cis-1,2-DCE	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
cis-1,3-Dichloropropene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2-Dibromo-3-chloropropane	ND	10		µg/L	50	9/25/2023 3:37:00 PM
Dibromochloromethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Dibromomethane	ND	10		µg/L	50	9/25/2023 3:37:00 PM
1,2-Dichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,3-Dichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,4-Dichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Dichlorodifluoromethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,1-Dichloroethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,1-Dichloroethene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2-Dichloropropane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,3-Dichloropropane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
2,2-Dichloropropane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM

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

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.
	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 2309D12

Date Reported: 10/3/2023

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: Trunk L Influent

Project: Trunk L

Collection Date: 9/22/2023 1:20:00 PM

Lab ID: 2309D12-001

Matrix: AIR

Received Date: 9/23/2023 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 8260B: VOLATILES</b>						Analyst: CCM
1,1-Dichloropropene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Hexachlorobutadiene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
2-Hexanone	ND	50		µg/L	50	9/25/2023 3:37:00 PM
Isopropylbenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
4-Isopropyltoluene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
4-Methyl-2-pentanone	ND	50		µg/L	50	9/25/2023 3:37:00 PM
Methylene chloride	ND	15		µg/L	50	9/25/2023 3:37:00 PM
n-Butylbenzene	ND	15		µg/L	50	9/25/2023 3:37:00 PM
n-Propylbenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
sec-Butylbenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Styrene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
tert-Butylbenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Tetrachloroethene (PCE)	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
trans-1,2-DCE	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
trans-1,3-Dichloropropene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2,3-Trichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2,4-Trichlorobenzene	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,1,1-Trichloroethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,1,2-Trichloroethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Trichloroethene (TCE)	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Trichlorofluoromethane	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
1,2,3-Trichloropropane	ND	10		µg/L	50	9/25/2023 3:37:00 PM
Vinyl chloride	ND	5.0		µg/L	50	9/25/2023 3:37:00 PM
Xylenes, Total	110	7.5		µg/L	50	9/25/2023 3:37:00 PM
Surr: Dibromofluoromethane	89.4	70-130		%Rec	50	9/25/2023 3:37:00 PM
Surr: 1,2-Dichloroethane-d4	81.6	70-130		%Rec	50	9/25/2023 3:37:00 PM
Surr: Toluene-d8	113	70-130		%Rec	50	9/25/2023 3:37:00 PM
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	50	9/25/2023 3:37:00 PM
<b>EPA METHOD 8015D: GASOLINE RANGE</b>						Analyst: CCM
Gasoline Range Organics (GRO)	17000	250		µg/L	50	9/25/2023 3:37:00 PM
Surr: BFB	87.9	70-130		%Rec	50	9/25/2023 3:37:00 PM

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

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

Page 2 of 2



## ANALYTICAL SUMMARY REPORT

October 02, 2023

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

Work Order: B23092180 Quote ID: B15626

Project Name: Not Indicated

---

Energy Laboratories Inc Billings MT received the following 1 sample for Hall Environmental on 9/26/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23092180-001	2309D12-001B, Trunk L Influent	09/22/23 13:20	09/26/23	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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Billings, MT 406.252.6325 • Casper, WY 307.235.0515  
Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

**LABORATORY ANALYTICAL REPORT**

Prepared by Billings, MT Branch

**Client:** Hall Environmental  
**Project:** Not Indicated  
**Lab ID:** B23092180-001  
**Client Sample ID:** 2309D12-001B, Trunk L Influent

**Report Date:** 10/02/23  
**Collection Date:** 09/22/23 13:20  
**Date Received:** 09/26/23  
**Matrix:** Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>GAS CHROMATOGRAPHY ANALYSIS REPORT</b>							
Oxygen	19.12	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Nitrogen	77.96	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Carbon Dioxide	2.40	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Hydrogen Sulfide	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Methane	0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Ethane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Propane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Isobutane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
n-Butane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Isopentane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
n-Pentane	<0.01	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Hexanes plus	0.51	Mol %		0.01		GPA 2261-95	09/27/23 13:39 / jrj
Propane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj
Isobutane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj
n-Butane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj
Isopentane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj
n-Pentane	< 0.001	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj
Hexanes plus	0.215	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj
GPM Total	0.215	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj
GPM Pentanes plus	0.215	gpm		0.001		GPA 2261-95	09/27/23 13:39 / jrj

**CALCULATED PROPERTIES**

Gross BTU per cu ft @ Std Cond. (HHV)	24		1		GPA 2261-95	09/27/23 13:39 / jrj
Net BTU per cu ft @ std cond. (LHV)	23		1		GPA 2261-95	09/27/23 13:39 / jrj
Pseudo-critical Pressure, psia	552		1		GPA 2261-95	09/27/23 13:39 / jrj
Pseudo-critical Temperature, deg R	248		1		GPA 2261-95	09/27/23 13:39 / jrj
Specific Gravity @ 60/60F	1.02		0.001		D3588-81	09/27/23 13:39 / jrj
Air, %	87.37		0.01		GPA 2261-95	09/27/23 13:39 / jrj

- The analysis was not corrected for air.

**COMMENTS**

-	-	09/27/23 13:39 / jrj
- 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: B23092180

Report Date: 10/02/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: GPA 2261-95</b>									Batch: R409565	
<b>Lab ID: B23092155-001ADUP</b> 12 Sample Duplicate									Run: GCNGA-B_230927A 09/27/23 09:43	
Oxygen		21.9	Mol %	0.01				0	20	
Nitrogen		78.1	Mol %	0.01				0	20	
Carbon Dioxide		0.05	Mol %	0.01				0.0	20	
Hydrogen Sulfide		<0.01	Mol %	0.01					20	
Methane		<0.01	Mol %	0.01					20	
Ethane		<0.01	Mol %	0.01					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	
<b>Lab ID: LCS092723</b> 11 Laboratory Control Sample									Run: GCNGA-B_230927A 09/27/23 15:27	
Oxygen		0.62	Mol %	0.01	124	70	130			
Nitrogen		6.02	Mol %	0.01	100	70	130			
Carbon Dioxide		1.00	Mol %	0.01	101	70	130			
Methane		74.3	Mol %	0.01	99	70	130			
Ethane		6.04	Mol %	0.01	101	70	130			
Propane		5.35	Mol %	0.01	108	70	130			
Isobutane		1.98	Mol %	0.01	99	70	130			
n-Butane		1.98	Mol %	0.01	99	70	130			
Isopentane		1.02	Mol %	0.01	102	70	130			
n-Pentane		1.00	Mol %	0.01	100	70	130			
Hexanes plus		0.73	Mol %	0.01	91	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

B23092180

Login completed by: Addison A. Gilbert

Date Received: 9/26/2023

Reviewed by: gmccartney

Received by: dnh

Reviewed Date: 9/27/2023

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 type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" 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:	17.4°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: <b>Energy Labs - Billings</b>		COMPANY: <b>Energy Laboratories</b>		PHONE: <b>(406) 869-6253</b>	FAX: <b>(406) 252-6069</b>
ADDRESS: <b>1120 South 27th Street</b>				ACCOUNT #:	
CITY, STATE, ZIP: <b>Billings, MT 59107</b>				EMAIL:	
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE
1	2309D12-001B	Trunk L Influent	TEDLAR	Air	9/22/2023 1:20:00 PM
					# CONTAINERS
					1 Natural Gas analysis *5 Day TAT*

## ANALYTICAL COMMENTS

B230922155  
B230922180 PG 26 Sep 23

## 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: <i>Cme</i>	Date: <b>9/25/2023</b>	Time: <b>9:36 AM</b>	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: <i>[Signature]</i>	Date: <i>9/26/23</i>	Time: <i>8:00</i>
TAT: Standard <input type="checkbox"/>			RUSH <input checked="" type="checkbox"/> Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>		
			FOR LAB USE ONLY		
			REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARDCOPY (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: 2309D12

RcptNo: 1

Received By: Juan Rojas 9/23/2023 7:00:00 AM

Completed By: Cheyenne Cason 9/25/2023 9:34:38 AM

Reviewed By: SCM 9/25/23

*[Signature]*

*[Signature]*

## Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐

2. How was the sample delivered? Client

## 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.)

# of preserved  
bottles checked  
for pH:

(<2 or >12 unless noted)

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

Checked by: ma/25/23

## 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	NA		



**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 279400

CONDITIONS

Operator: Harvest Four Corners, LLC 1755 Arroyo Dr Bloomfield, NM 87413	OGRID: 373888
	Action Number: 279400
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. Please see App ID 339334 for most updated status.	7/3/2024