NV

TIMBERWOLF ENVIRONMENTAL

1115 Welsh Ave, Suite B
College Station, Texas 77845
979.324.2139
www.teamtimberwolf.com

October 14, 2022

Mr. Nelson Velez, Environmental Specialist – Advanced
New Mexico Oil Conservation Division – District 3
1000 Rio Brazos Road
Aztec, New Mexico 87410

Re: Status Report – 3rd Quarter 2022
San Juan 28-7 Unit 183M
Rio Arriba County, New Mexico
OCD Incident No. NCS1901627746

Dear Mr. Velez:

On behalf of Hilcorp Energy Company (Hilcorp), Timberwolf Environmental, LLC (Timberwolf) presents this report to document remedial activities conducted during the third quarter of 2022 (3Q22) at the San Juan 28-7 Unit 183M (Site).

Environmental Setting and Site Geology

The Site is situated on federal land managed by the Bureau of Land Management (BLM) in western Rio Arriba County, New Mexico (Figure 1). The area consists of sparse vegetative cover comprised primarily of scrub brush and native grasses. Area terrain is comprised of plateaus divided by canyons. The primary canyon in the area is Carrizo Canyon, which drains to the northwest into the San Juan River, approximately 19 miles from the Site (Figures 2 and 3).

The Site is situated along the rimrock of an unnamed side canyon to Carrizo Canyon. Average elevation at the Site is approximately 6,523 feet (ft) above mean sea level. The closest surface water is a first order tributary of Carrizo Creek, situated 1,500 ft southeast of the Site and 330 ft lower in elevation.

According to the U.S. Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), the Site soil consists of the Vessilla-Menefee-Orlie complex, 2 to 30 percent slopes. The surface horizon is comprised of a sandy loam, underlain by bedrock encountered between 15 to 19 inches below ground surface (bgs). Native salinity of the soil is nonsaline to very slightly saline (0.0 to 2.0 millimhos per centimeter (mmhos/cm)).

Site History

Release Event

Corrosion near the base of the former oil tank resulted in the release of approximately 150 barrels (bbls) of oil and 7 bbls of produced water. All released fluid was contained by the berm. Standing fluid was recovered; the tank was removed from service and disposed off-site. The initial investigation identified the area of the former tank battery as the primary area of concern (AOC).

Hilcorp constructed a new tank battery northeast of the original tank battery. Tanks and interconnective piping were removed from the original tank battery.

Investigation and Site Characterization

A soil investigation, conducted during March 2019, revealed the constituents of concern (COC) were: total BTEX (i.e., benzene, toluene, ethylbenzene, and xylene) and total petroleum hydrocarbons (TPH). Impacted soil was horizontally and vertically delineated; the vertical extent of impacted soil was approximately 27 ft bgs. Additionally, the soil investigation revealed that subsurface soil is unconsolidated to a depth of 10 ft below ground surface (bgs) which is underlain by sandstone. Findings of the investigation are documented in Timberwolf's report entitled: *Site Characterization Report and Remedial Action Plan*, dated May 21, 2019.

Remediation – SVE System

To remediate hydrocarbon impacted soil, a soil vapor extraction (SVE) system was designed, constructed, and installed at the Site. System start-up date was 12/18/19. The SVE system is comprised of 11 SVE wells, four vent wells, and a SVE trailer. The SVE trailer is comprised of a regenerative blower (i.e., vacuum pump), hour meter, moisture separator and filter, sampling port, and a manifold with three independent legs. Additionally, the SVE trailer is equipped with a programmable automation panel to control valves for each manifold leg. A natural gas generator powers the trailer.

The SVE system creates a treatment field of approximately 0.15 acres and treats soil to a depth of approximately 30 ft bgs for a total volume of approximately 7,021 cubic yards of soil. The SVE wells, measured radius of influence of 25 ft, and leg configurations are shown in Figure 4.

The work conducted is documented in the following reports:

- *Site Characterization Plan,* dated 03/05/19
- *Site Characterization and Remedial Action Plan*, dated 05/21/19
- *Status Report – 4th Quarter 2019,* dated 01/31/20
- *Status Report – 1st Quarter 2020,* dated 04/30/20
- *Status Report – 2nd Quarter 2020,* dated 09/03/20
- *Status Report – 3rd Quarter 2020,* dated 11/25/20
- *Status Report – 4th Quarter 2020,* dated 01/28/21
- *Status Report – 1st Quarter 2021,* dated 05/05/21
- *Status Report – 2nd Quarter 2021,* dated 07/28/21
- *Status Report – 3rd Quarter 2021,* dated 10/29/22

- *Status Report – 4th Quarter 2021, dated 01/28/22*
- *Status Report – 1st Quarter 2022, dated 04/13/22*
- *Status Report- 2nd Quarter 2022, dated 07/14/22*

SVE System Operations

The SVE system was designed with three independent legs (i.e., Leg 1, Leg 2, and Leg 3). Legs 1 and 3 provide vacuum extraction to the deep SVE wells; Leg 2 is piped to the shallow wells. The automation panel was programmed to oscillate between Legs 1, 2, and 3 every four hours for continuous 24-hr operations. Programmed runtimes are presented in Table 1 below.

Table 1. Programmed Runtimes and Leg Configurations

Leg	SVE Wells and Location	Scheduled Runtime
Leg 1	Deep Wells SVE7, SVE8, and SVE9 Eastern side of treatment zone	4 hours
Leg 2	Shallow Wells SVE1, SVE2, SVE3, and SVE4	4 hours
Leg 3	Deep Wells SVE5, SVE6, SVE10, and SVE11 Central and Western side of treatment zone	4 hours

SVE – soil vapor extraction well

Water and condensate are collected in the moisture separator, which is fitted with a 1-inch PVC pipe to transfer fluids to an open-top tank fitted with bird netting. No water or condensate was recovered during 3Q22. SVE system runtime for 3Q22 is documented in Table 2 below.

Table 2. System Runtime – 3Q22

Date	Hour Meter
06/20/22	1617
07/07/22	2028
07/21/22	2365
08/02/22	2654
08/15/22	2961
09/06/22	3485
09/19/22	3798
Total Runtime	2,181

System runtime between the last reading during 2Q22 (6/20/22) and the final reading of 3Q22 (9/19/22) was 2,181 hours; the total available hours for that period was 2,184 hours. Therefore, the system runtime in 3Q22 was 99.86 percent (%). Photographs of relevant meter readings are documented in the attached Photographic Log.

During 3Q22, Hilcorp personnel conducted six (6) operational checks and one (1) maintenance event; seven (7) operation and maintenance (O&M) events in total. A field log of O&M events and maintenance performed is provided in the attached Table A-1.

Mass Removal

Timberwolf used the laboratory results from a soil-gas sample (collected by Hilcorp on 09/06/22), flow rates, and runtimes to calculate constituent mass removal. Mass removal of GRO and BTEX and associated recovered volume for 3Q22 are presented in Table 3 below; cumulative totals are provided in the attached Table A–2.

Table 3. Mass Removal and Associated Volume – 3Q22

Constituent	Mass Removal (kg)[1]	Total Mass Removed[2] (lbs)	Recovered Volume[3] (bbl)
GRO	420.8	211.8	2.54
Benzene	1.79	3.93	NC
Toluene	7.75	17.1	NC
Ethylbenzene	1.09	2.40	NC
Xylenes	8.77	19.29	NC

[1]Calculation = minutes ran * CFM * Concentration (mg/m^3) * 1 M^3/35.3147 ft^3 *1g/1000 mg * 1 kg/1000 g
[2]Calculation = Mass Removal in kg * 2.2 lbs/kg
[3]Calculation = lbs / 6.42 lb/gal / 42 gal/bbl
GRO = from TPH (GC/MS) Low Fraction (i.e., gasoline range organics)
kg – kilograms
bbl -barrel
lbs – pounds
NC – not calculated
Assumptions:

- API Gravity = 52
- Concentrations of VOCs in soil gas vapor have remained static over the quarter
- Runtime readings based on hour meter readings on 06/01/22 and 07/07/22. Cygnet remote monitoring confirmed minimal down time during 3Q22

Collection and Analysis of Soil-Gas Sample

On 09/06/22, Hilcorp personnel collected a quarterly soil-gas sample utilizing a vacuum pump and Tedlar® bag. The vacuum pump was connected to the SVE systems sampling port while all three (3) legs were open. The valve on the sampling port was then opened and pump was activated to purge ambient air from the connecting tubing and pump.

After purging, the Tedlar® bag was connected to the vacuum pump outlet using dedicated tubing, the valve on the Tedlar® bag was opened and the vacuum pump was activated to collect the SVE gas sample. Once the Tedlar® bag was filled, the valve on the bag was closed and disconnected from the tubing. The sampling port was then closed, and vacuum pump disconnected from sampling port.

The gas sample was transported to Hall Environmental and Analytical Laboratory (HEAL) in Albuquerque, New Mexico. HEAL subcontracted the analysis to Pace National in Mt. Juliet, Tennessee for chemical analysis. All sample transfers were conducted under proper chain-of-custody protocol.

The sample was analyzed for volatile organic compounds (VOCs) using EPA Method Toxic Organics 15 (i.e., TO–15) and Organic Compounds (GC) by ASTM Method D1946. Laboratory report and chain-of-custody documents are attached.

Constituents that exceeded laboratory detection limits are presented in Table 4 below; laboratory results of all constituents are documented in the Attached Table A-3.

Table 4. Soil-Gas Analysis – 09/06/22

Constituents	SVE
Volatile Organic Carbons, mg/m3	
Benzene	21.1
Ethylbenzene	12.9
Acetone	3.42
Benzyl Chloride	21.1
Cyclohexane	135
Ethanol	3.22
Ethylbenzene	12.9
4-Ethyltoluene	6.38
Heptane	235
n-Hexane	137
Isopropylbenezene	2.64
2-Butanone	1.1
2-Propanol	23.0
Propene	0.32
Toluene	91.5
1,2,4-Trimethylbenzene	3.74
1,3,5-Trimethylbenzene	5.99
1,2,3-Trimethylbenzene	0.486
Total Xylenes	103.5
1,1-Difluoroethane	1.18
Methyl Cyclohexane	518
TPH (GC/MS) Low Fraction (i.e., GRO)	3,670
Organic Compounds, %	
Oxygen	20.6

mg/m^3 – milligrams per cubic meter
% - percent
TPH – total petroleum hydrocarbons
GRO – gasoline range organics

Summary

System runtime during 3Q22 was 99.86% of total available hours during the period. Runtime hours based on hour meter readings taken on 06/20/22 and 09/19/22. Cygnet remote monitoring system confirms operation through the quarter.

Mass removal calculations indicated the following product recovery during the quarter:

- 2.54 bbl of GRO
- 3.93 lbs of benzene
- 17.1 lbs of toluene
- 2.40 lbs of ethylbenzene
- 19.3 lbs of xylene

Further Actions – Fourth Quarter 2022

During 4Q22, the following activities are planned for the Site:

- Conduct bi-weekly Site O&M to ensure proper system function and drain any water/condensate accumulation from the moisture separator as needed
- Collect a quarterly soil vapor gas sample and for laboratory analysis
- Prepare a 4Q22 status report

If you have any questions regarding this report, please call us at 979-324-2139.

Sincerely,
Timberwolf Environmental, LLC

Kevin Cole
Project Manager

Jim Foster
President

Attachments: Figures
Attached Tables
Photographic Log
Laboratory Report and Chain-of-Custody Documents

Cc: Kate Kaufman, Hilcorp Energy Company

Figures

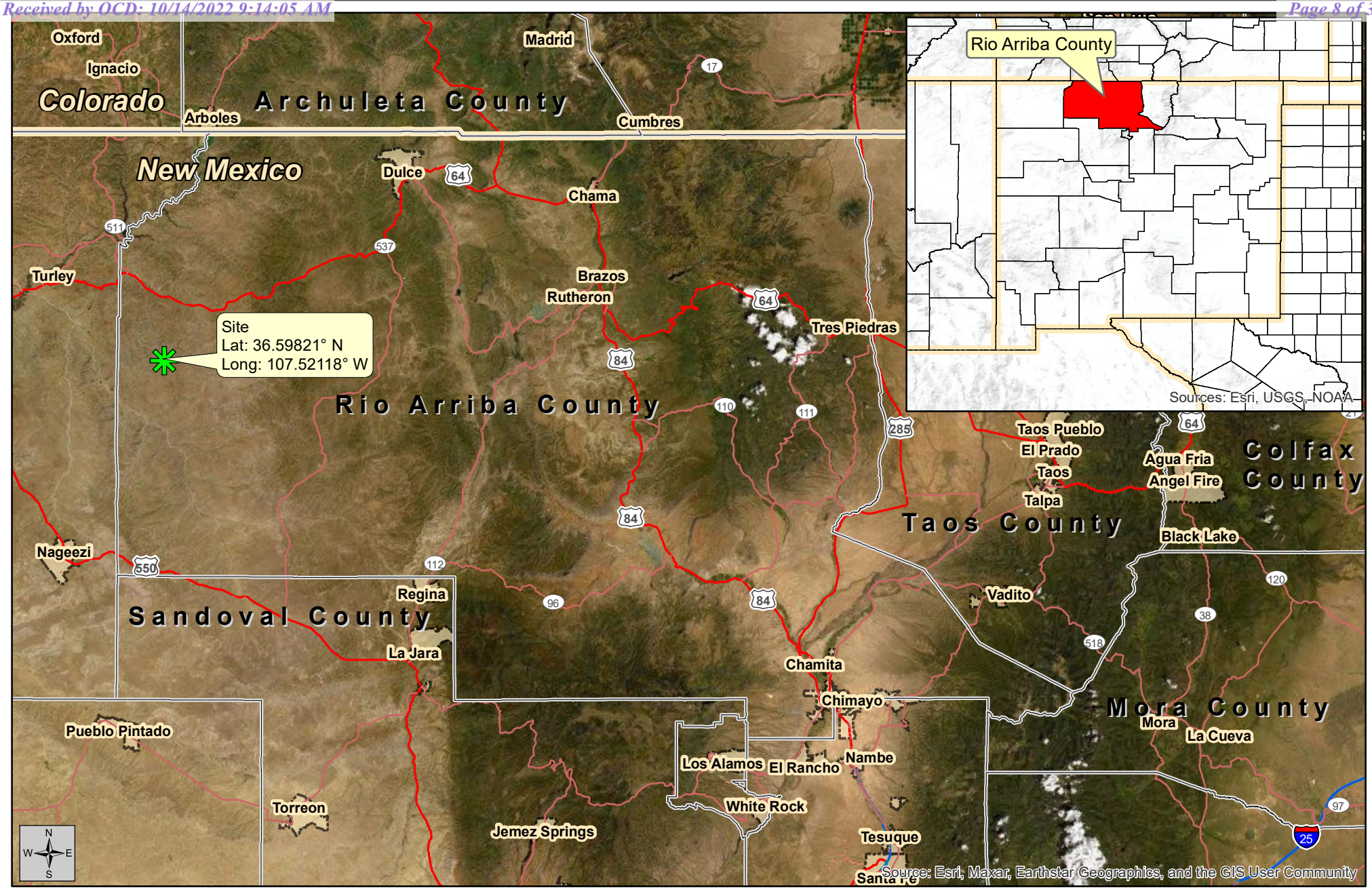

Figure 1
Site Location Map

Status Report - 3rd Quarter 2022

October 11, 2022

1:1,250,000

0 20 40 60 80 100 120 Miles

San Juan 28-7 Unit 183M (OCD Incident No. NCS1901627746)
Hilcorp Energy Company
Rio Arriba County, New Mexico

Timberwolf Environmental

Created By:
Brett Berno
TE Project No.: HEC-190007

Datum: NAD83
Imagery Source: ESRI
Vector Source: ESRI and TE

Site

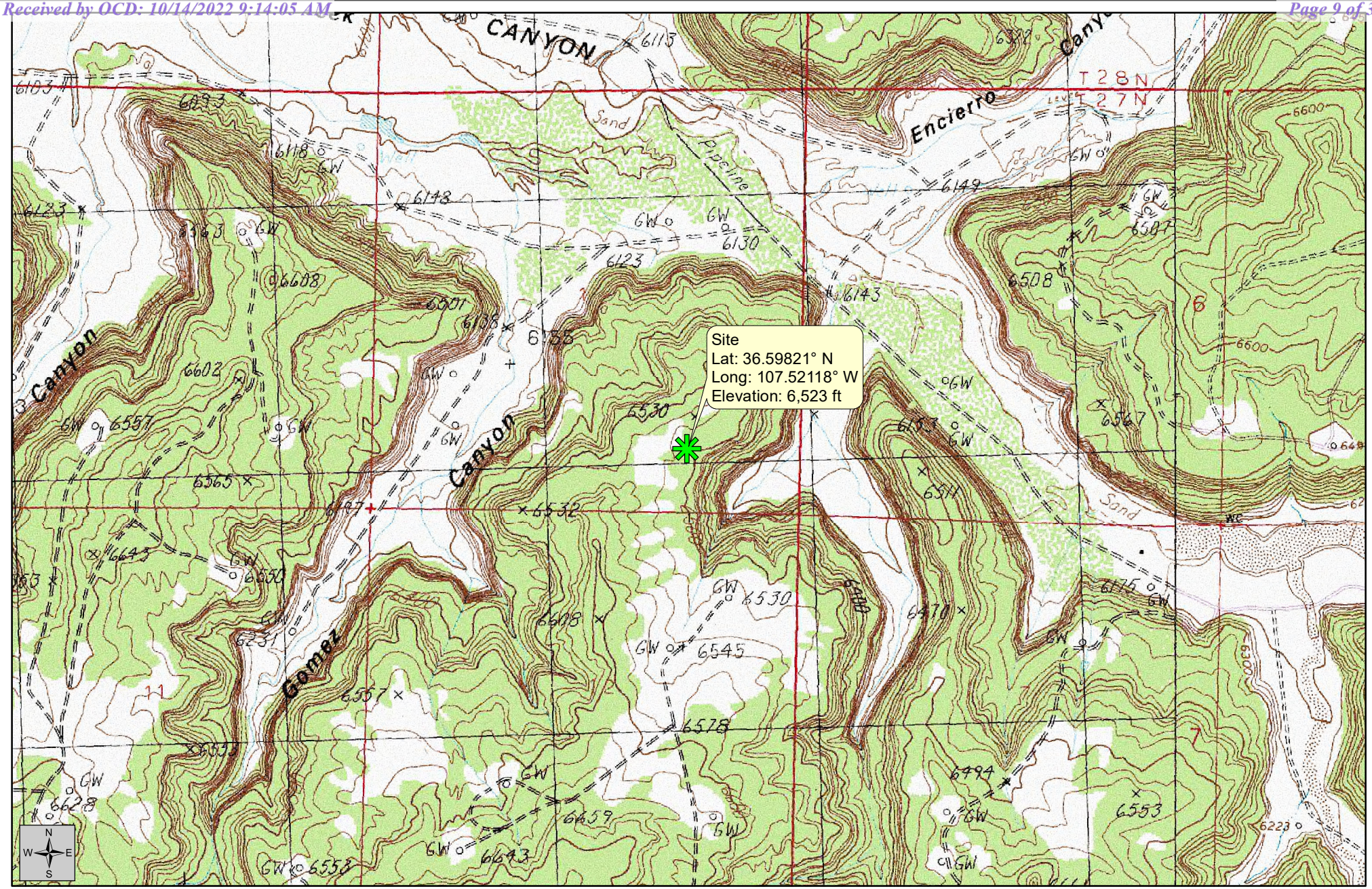

Figure 2 **Topographic Map**	**Status Report - 3rd Quarter 2022**	**October 11, 2022**

1:24,000

0 0.5 1 1.5 2 Miles

San Juan 28-7 Unit 183M (OCD Incident No. NCS1901627746)
Hilcorp Energy Company
Rio Arriba County, New Mexico

Created By:
Brett Berno
TE Project No.: HEC-190007

Datum: NAD83
Imagery Source: USGS
Quads: Gould Pass and Santos Peak
Vector Source: TE

Site

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Figure 3
Aerial Map

Status Report - 3rd Quarter 2022

October 11, 2022

1:10,000

0 0.25 0.5 0.75 1 Miles

San Juan 28-7 Unit 183M (OCD Incident No. NCS1901627746)
Hilcorp Energy Company
Rio Arriba County, New Mexico

Timberwolf Environmental

Created By:
Brett Berno
TE Project No.: HEC-190007

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Site

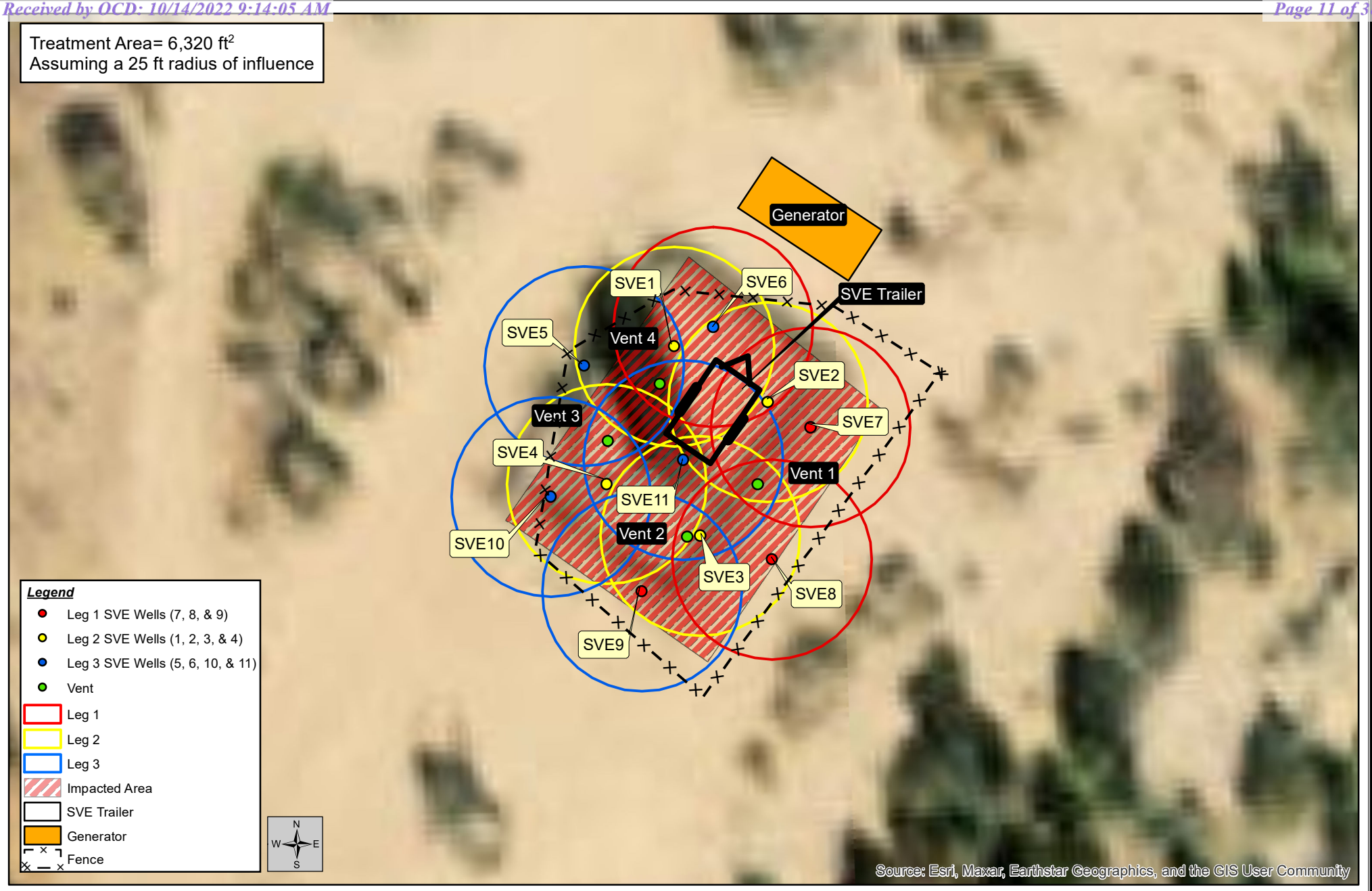


Figure 4 **SVE System Overview**	**Status Report - 3rd Quarter 2022**	**October 11, 2022**

1:250

0 25 50 75 100 125 Feet

San Juan 28-7 Unit 183M (OCD Incident No. NCS1901627746)
Hilcorp Energy Company
Rio Arriba County, New Mexico

TIMBERWOLF ENVIRONMENTAL

Created By:
Brett Berno
TE Project No.: HEC-190007

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Attached Tables

Table A-1. Operation and Maintenance Events
Status Report - 3rd Quarter 2022
San Juan 28-7 Unit 183M (OCD Incident No. NCS1901627746)

Date	Hour Meter (hrs)	Water/Condenstate Recovered (gal)	Maintenance Performed
07/07/22	2,028.0	0.0	• Brandon Sinclair with Hilcorp performed SVE system O&M checks
07/21/22	2,365.0	0.0	• Brandon Sinclair with Hilcorp performed SVE system O&M checks
08/02/22	2,654.6	0.0	• Brandon Sinclair with Hilcorp performed SVE system O&M checks
08/04/22	--	0.0	• System was down for routine generator maintenance
08/15/22	2,961.0		• Brandon Sinclair with Hilcorp performed SVE system O&M checks
09/06/22	3,485.4	0.0	• Brandon Sinclair with Hilcorp performed SVE system O&M checks
09/19/22	3,798.2	0.0	• Brandon Sinclair with Hilcorp performed SVE system O&M checks

gal - gallons
hrs - hours

Table A-2. Cumulative Mass Removal
Status Report - 3rd Quarter 2022
San Juan 28-7 Unit 183M (OCD Incident No. NCS1901627746)

Quarter	Constituent (lbs)					Recovered Volume (bbl)
	Benzene	Toluene	Ethylbenzene	Xylene	GRO	GRO
4Q19	18.5	32.4	0.73	6.27	1,017	3.77
1Q20	5.01	18.01	0.48	3.65	403.47	1.50
2Q20	6.66	23.95	0.64	4.85	536.65	1.99
3Q20	14.82	53.32	1.43	10.80	1,194.72	4.43
4Q20	1.71	6.16	0.16	1.25	138.07	0.51
1Q21	22.85	82.18	2.20	16.65	1,841.41	6.83
2Q21	2.13	15.09	1.17	12.63	55.43	0.21
3Q21	2.51	17.78	1.38	14.88	65.30	0.24
4Q21	2.60	18.40	1.43	15.40	67.57	0.25
1Q22	0.44	3.60	0.32	4.84	242.40	0.90
2Q22	0.32	2.61	0.27	5.57	146.98	0.55
3Q22	2.54	3.93	17.10	2.40	684.10	2.54
Total	80.09	277.43	27.31	99.19	6,393.10	23.72

mass (mg) removed equation = ((CFM*volatile*runtime in minutes)/(35.3147))
lbs - pounds
bbl - barrels

Table A-3. Gas Analysis - 09/07/22
Status Report - 3rd Quarter 2022
San Juan 28-7 Unit 183M
Rio Arriba County, New Mexico

Volatiles	SVE (ug/m3)
Acetone	3,420
Allyl chloride	< 62.6
Benzene	21,100
Benzyl Chloride	< 104
Bromodichloromethane	< 134
Bromoform	< 621
Bromomethane	< 77.6
1,3-Butadiene	< 443
Carbon disulfide	< 62.2
Carbon tetrachloride	< 126
Chlorobenzene	< 92.4
Chloroethane	< 52.8
Chloroform	< 97.3
Chloromethane	< 41.3
2-Chlorotoluene	< 103
Cyclohexane	135,000
Dibromochloromethane	< 170
1,2-Dibromoethane	< 154
1,2-Dichlorobenzene	< 120
1,3-Dichlorobenzene	< 120
1,4-Dichlorobenzene	< 120
1,2-Dichloroethane	< 81.0
1,1-Dichloroethane	< 80.2
1,1-Dichloroethene	< 79.3
cis-1,2-Dichloroethene	< 79.3
trans-1,2-Dichloroethene	< 79.3
1,2-Dichloropropane	< 92.4
cis-1,3-Dichloropropene	< 90.8
trans-1,3-Dichloropropene	< 90.8
1,4-Dioxane	< 72.1
Ethanol	3,220
Ethylbenzene	12,900
4-Ethyltoluene	6,380
Trichlorofluoromethane	< 112
Dichlorodifluoromethane	< 98.9
1,1,2-Trichlorotrifluoroethane	< 153
1,2-Dichlorotetrafluoroethane	< 140
Heptane	235,000
Hexachloro-1,3-butadiene	< 673
n-Hexane	137,000

Isopropylbenzene	2,640.0
Methylene Chloride	< 69.4
Methyl Butyl Ketone	< 511
2-Butanone (MEK)	1,100
4-Methyl-2-pentanone (MIBK)	< 512
Methyl methacrylate	< 81.9
MTBE	< 72.1
Naphthalene	< 330
2-Propanol	23,000
Propene	320
Styrene	< 85.1
1,1,2,2-Tetrachloroethane	< 137
Tetrachloroethylene	< 136
Tetrahydrofuran	< 59.0
Toluene	91,500
1,2,4-Trichlorobenzene	< 466
1,1,1-Trichloroethane	< 109
1,1,2-Trichloroethane	< 109
Trichloroethylene	< 107
1,2,4-Trimethylbenzene	3,740
1,3,5-Trimethylbenzene	5,990
2,2,4-Trimethylpentane	< 93.4
Vinyl chloride	< 51.1
Vinyl Bromide	< 87.5
Vinyl acetate	< 70.4
m&p-Xylene	85,000
o-Xylene	18,500
TPH (GC/MS) Low Fraction	3,670,000 [B]
1,1-Difluoroethane	1,180
1,2,3-Trimethylbenzene	486
Chlorodifluoromethane	< 70.8
Ethyl acetate	< 72.0
Methyl Cyclohexane	518,000
Tert-Amyl Ethyl Ether	< 95.1
Oxygen	20.60%
Carbon Monoxide	< 2.0 %
Carbon Dioxide	< 0.500 %
Methane	< 0.400 %

ug/m3 Micrograms per cubic meter

B - The same analyte is found in the associated blank.

Photographic Log

TIMBERWOLF ENVIRONMENTAL
1920 W. Villa Maria Suite 205
Bryan, TX 77807
(979) 485-9094
www.teamtimberwolf.com

PHOTOGRAPHIC LOG

Project No.:	HEC-190007	**Client:**	Hilcorp Energy Company
Project Name:	San Juan 28-7 No. 183M	**Site Location:**	Rio Arriba County, New Mexico
Task Description:	Status Report - 3rd Quarter 2022	**Date:**	July - September, 2022

Photo No.: 1

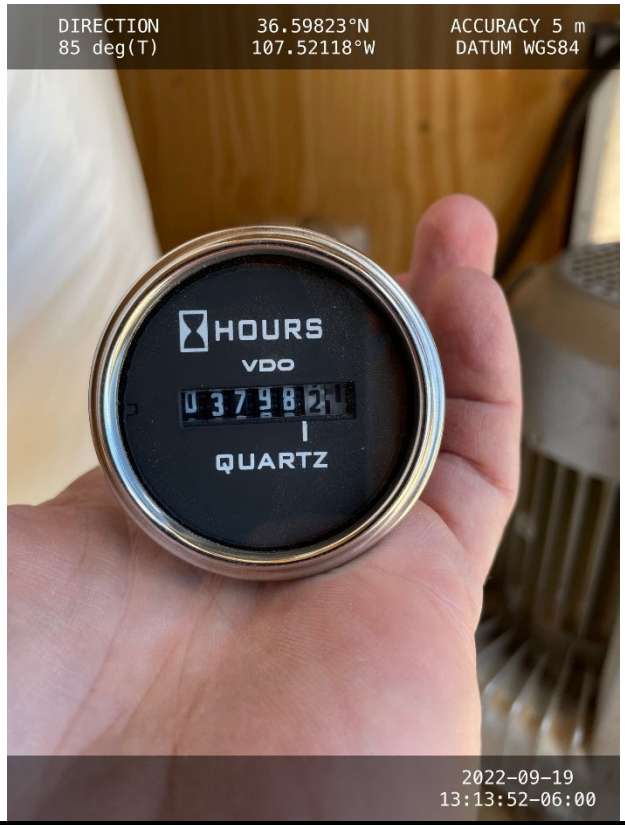
Direction: N/A

Comments: View of hour meter on 06/20/22.

Photo No.: 2

Direction: N/A

Comments: View of hour meter from 9/19/22.



Laboratory Data and Chain-of-Custody Documents

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

September 19, 2022

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

RE: SJ 28 7 Unit 183M OrderNo.: 2209235

Dear Kate Kaufman:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/7/2022 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com 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

Pace Analytical®

ANALYTICAL REPORT

September 16, 2022

Hall Environmental Analysis Laboratory

Sample Delivery Group:	L1533401
Samples Received:	09/08/2022
Project Number:	
Description:	

Report To: Andy Freeman
4901 Hawkins NE
Albuquerque, NM 87109

Entire Report Reviewed By: John V Hawkins

John Hawkins
Project Manager

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

2209235-001A SVE-1 L1533401-01 Air

	Collected by	Collected date/time	Received date/time
		09/06/22 11:30	09/08/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1925401	100	09/13/22 12:41	09/13/22 12:41	CEP	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1926156	2000	09/14/22 12:20	09/14/22 12:20	DAH	Mt. Juliet, TN
Organic Compounds (GC) by Method D1946	WG1925243	1	09/13/22 11:22	09/13/22 11:22	JAP	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Sample Delivery Group (SDG) Narrative

Sample received in tedlar bag.

Lab Sample ID	Project Sample ID	Method
L1533401-01	2209235-001A SVE-1	TO-15

Analysis was performed from an improper container for the following samples.

Lab Sample ID	Project Sample ID	Method
L1533401-01	2209235-001A SVE-1	D1946

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	125	297	1440	3420		100	WG1925401
Allyl chloride	107-05-1	76.53	20.0	62.6	ND	ND		100	WG1925401
Benzene	71-43-2	78.10	20.0	63.9	6620	21100		100	WG1925401
Benzyl Chloride	100-44-7	127	20.0	104	ND	ND		100	WG1925401
Bromodichloromethane	75-27-4	164	20.0	134	ND	ND		100	WG1925401
Bromoform	75-25-2	253	60.0	621	ND	ND		100	WG1925401
Bromomethane	74-83-9	94.90	20.0	77.6	ND	ND		100	WG1925401
1,3-Butadiene	106-99-0	54.10	200	443	ND	ND		100	WG1925401
Carbon disulfide	75-15-0	76.10	20.0	62.2	ND	ND		100	WG1925401
Carbon tetrachloride	56-23-5	154	20.0	126	ND	ND		100	WG1925401
Chlorobenzene	108-90-7	113	20.0	92.4	ND	ND		100	WG1925401
Chloroethane	75-00-3	64.50	20.0	52.8	ND	ND		100	WG1925401
Chloroform	67-66-3	119	20.0	97.3	ND	ND		100	WG1925401
Chloromethane	74-87-3	50.50	20.0	41.3	ND	ND		100	WG1925401
2-Chlorotoluene	95-49-8	126	20.0	103	ND	ND		100	WG1925401
Cyclohexane	110-82-7	84.20	400	1380	39200	135000		2000	WG1926156
Dibromochloromethane	124-48-1	208	20.0	170	ND	ND		100	WG1925401
1,2-Dibromoethane	106-93-4	188	20.0	154	ND	ND		100	WG1925401
1,2-Dichlorobenzene	95-50-1	147	20.0	120	ND	ND		100	WG1925401
1,3-Dichlorobenzene	541-73-1	147	20.0	120	ND	ND		100	WG1925401
1,4-Dichlorobenzene	106-46-7	147	20.0	120	ND	ND		100	WG1925401
1,2-Dichloroethane	107-06-2	99	20.0	81.0	ND	ND		100	WG1925401
1,1-Dichloroethane	75-34-3	98	20.0	80.2	ND	ND		100	WG1925401
1,1-Dichloroethene	75-35-4	96.90	20.0	79.3	ND	ND		100	WG1925401
cis-1,2-Dichloroethene	156-59-2	96.90	20.0	79.3	ND	ND		100	WG1925401
trans-1,2-Dichloroethene	156-60-5	96.90	20.0	79.3	ND	ND		100	WG1925401
1,2-Dichloropropane	78-87-5	113	20.0	92.4	ND	ND		100	WG1925401
cis-1,3-Dichloropropene	10061-01-5	111	20.0	90.8	ND	ND		100	WG1925401
trans-1,3-Dichloropropene	10061-02-6	111	20.0	90.8	ND	ND		100	WG1925401
1,4-Dioxane	123-91-1	88.10	20.0	72.1	ND	ND		100	WG1925401
Ethanol	64-17-5	46.10	125	236	1710	3220		100	WG1925401
Ethylbenzene	100-41-4	106	20.0	86.7	2980	12900		100	WG1925401
4-Ethyltoluene	622-96-8	120	20.0	98.2	1300	6380		100	WG1925401
Trichlorofluoromethane	75-69-4	137.40	20.0	112	ND	ND		100	WG1925401
Dichlorodifluoromethane	75-71-8	120.92	20.0	98.9	ND	ND		100	WG1925401
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	20.0	153	ND	ND		100	WG1925401
1,2-Dichlorotetrafluoroethane	76-14-2	171	20.0	140	ND	ND		100	WG1925401
Heptane	142-82-5	100	400	1640	57500	235000		2000	WG1926156
Hexachloro-1,3-butadiene	87-68-3	261	63.0	673	ND	ND		100	WG1925401
n-Hexane	110-54-3	86.20	1260	4440	38800	137000		2000	WG1926156
Isopropylbenzene	98-82-8	120.20	20.0	98.3	537	2640		100	WG1925401
Methylene Chloride	75-09-2	84.90	20.0	69.4	ND	ND		100	WG1925401
Methyl Butyl Ketone	591-78-6	100	125	511	ND	ND		100	WG1925401
2-Butanone (MEK)	78-93-3	72.10	125	369	372	1100		100	WG1925401
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	125	512	ND	ND		100	WG1925401
Methyl methacrylate	80-62-6	100.12	20.0	81.9	ND	ND		100	WG1925401
MTBE	1634-04-4	88.10	20.0	72.1	ND	ND		100	WG1925401
Naphthalene	91-20-3	128	63.0	330	ND	ND		100	WG1925401
2-Propanol	67-63-0	60.10	125	307	9360	23000		100	WG1925401
Propene	115-07-1	42.10	125	215	186	320		100	WG1925401
Styrene	100-42-5	104	20.0	85.1	ND	ND		100	WG1925401
1,1,2,2-Tetrachloroethane	79-34-5	168	20.0	137	ND	ND		100	WG1925401
Tetrachloroethylene	127-18-4	166	20.0	136	ND	ND		100	WG1925401
Tetrahydrofuran	109-99-9	72.10	20.0	59.0	ND	ND		100	WG1925401
Toluene	108-88-3	92.10	1000	3770	24300	91500		2000	WG1926156
1,2,4-Trichlorobenzene	120-82-1	181	63.0	466	ND	ND		100	WG1925401

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	20.0	109	ND	ND		100	WG1925401
1,1,2-Trichloroethane	79-00-5	133	20.0	109	ND	ND		100	WG1925401
Trichloroethylene	79-01-6	131	20.0	107	ND	ND		100	WG1925401
1,2,4-Trimethylbenzene	95-63-6	120	20.0	98.2	762	3740		100	WG1925401
1,3,5-Trimethylbenzene	108-67-8	120	20.0	98.2	1220	5990		100	WG1925401
2,2,4-Trimethylpentane	540-84-1	114.22	20.0	93.4	ND	ND		100	WG1925401
Vinyl chloride	75-01-4	62.50	20.0	51.1	ND	ND		100	WG1925401
Vinyl Bromide	593-60-2	106.95	20.0	87.5	ND	ND		100	WG1925401
Vinyl acetate	108-05-4	86.10	20.0	70.4	ND	ND		100	WG1925401
m&p-Xylene	1330-20-7	106	40.0	173	19600	85000		100	WG1925401
o-Xylene	95-47-6	106	20.0	86.7	4270	18500		100	WG1925401
TPH (GC/MS) Low Fraction	8006-61-9	101	400000	1650000	889000	3670000	B	2000	WG1926156
1,1-Difluoroethane	75-37-6	66.05	100	270	438	1180		100	WG1925401
1,2,3-Trimethylbenzene	526-73-8	120.10	20.0	98.2	98.9	486		100	WG1925401
Chlorodifluoromethane	75-45-6	86.50	20.0	70.8	ND	ND		100	WG1925401
Ethyl acetate	141-78-6	88	20.0	72.0	ND	ND		100	WG1925401
Methyl Cyclohexane	108-87-2	98.1860	400	1610	129000	518000		2000	WG1926156
Tert-Amyl Ethyl Ether	919-94-8	116.20	20.0	95.1	ND	ND		100	WG1925401
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*201*				WG1925401
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*100*				WG1926156

Sample Narrative:

L1533401-01 WG1925401: Surrogate failure due to matrix interference

Organic Compounds (GC) by Method D1946

Analyte	CAS #	Mol. Wt.	RDL %	Result %	Qualifier	Dilution	Batch
Oxygen	7782-44-7	32	5.00	20.6		1	WG1925243
Carbon Monoxide	630-08-0	28	2.00	ND		1	WG1925243
Carbon Dioxide	124-38-9	44.01	0.500	ND		1	WG1925243
Methane	74-82-8	16	0.400	ND		1	WG1925243

Method Blank (MB)

(MB) R3836629-3 09/13/22 10:14

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.584	1.25
Allyl Chloride	U		0.114	0.200
Benzene	U		0.0715	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0702	0.200
Bromoform	U		0.0732	0.600
Bromomethane	U		0.0982	0.200
1,3-Butadiene	U		0.104	2.00
Carbon disulfide	U		0.102	0.200
Carbon tetrachloride	U		0.0732	0.200
Chlorobenzene	U		0.0832	0.200
Chloroethane	U		0.0996	0.200
Chloroform	U		0.0717	0.200
Chloromethane	U		0.103	0.200
2-Chlorotoluene	U		0.0828	0.200
Dibromochloromethane	U		0.0727	0.200
1,2-Dibromoethane	U		0.0721	0.200
1,2-Dichlorobenzene	U		0.128	0.200
1,3-Dichlorobenzene	U		0.182	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0700	0.200
1,1-Dichloroethane	U		0.0723	0.200
1,1-Dichloroethene	U		0.0762	0.200
cis-1,2-Dichloroethene	U		0.0784	0.200
trans-1,2-Dichloroethene	U		0.0673	0.200
1,2-Dichloropropane	U		0.0760	0.200
cis-1,3-Dichloropropene	U		0.0689	0.200
trans-1,3-Dichloropropene	U		0.0728	0.200
1,4-Dioxane	U		0.0833	0.200
Ethanol	0.870	J	0.265	1.25
Ethylbenzene	U		0.0835	0.200
4-Ethyltoluene	U		0.0783	0.200
Trichlorofluoromethane	U		0.0819	0.200
Dichlorodifluoromethane	U		0.137	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0793	0.200
1,2-Dichlorotetrafluoroethane	U		0.0890	0.200
Hexachloro-1,3-butadiene	U		0.105	0.630
Isopropylbenzene	U		0.0777	0.200
Methylene Chloride	U		0.0979	0.200
Methyl Butyl Ketone	U		0.133	1.25

Method Blank (MB)

(MB) R3836629-3 09/13/22 10:14

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
2-Butanone (MEK)	U		0.0814	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0765	1.25
Methyl Methacrylate	U		0.0876	0.200
MTBE	U		0.0647	0.200
Naphthalene	U		0.350	0.630
2-Propanol	U		0.264	1.25
Propene	0.223	J	0.0932	1.25
Styrene	U		0.0788	0.200
1,1,2,2-Tetrachloroethane	U		0.0743	0.200
Tetrachloroethylene	U		0.0814	0.200
Tetrahydrofuran	U		0.0734	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0736	0.200
1,1,2-Trichloroethane	U		0.0775	0.200
Trichloroethylene	U		0.0680	0.200
1,2,4-Trimethylbenzene	U		0.0764	0.200
1,3,5-Trimethylbenzene	U		0.0779	0.200
2,2,4-Trimethylpentane	U		0.133	0.200
Vinyl chloride	U		0.0949	0.200
Vinyl Bromide	U		0.0852	0.200
Vinyl acetate	U		0.116	0.200
m&p-Xylene	U		0.135	0.400
o-Xylene	U		0.0828	0.200
1,1-Difluoroethane	0.520	J	0.129	1.00
1,2,3-Trimethylbenzene	U		0.0805	0.200
Chlorodifluoromethane	U		0.131	0.200
Ethyl acetate	U		0.100	0.200
Tert-Amyl Ethyl Ether	U		0.0778	0.200
(S) 1,4-Bromofluorobenzene	*97.4*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3836629-1 09/13/22 08:51 • (LCSD) R3836629-2 09/13/22 09:34

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	3.75	4.47	4.44	119	118	70.0-130			0.673	25
Allyl Chloride	3.75	4.47	4.41	119	118	70.0-130			1.35	25
Benzene	3.75	4.02	4.04	107	108	70.0-130			0.496	25
Benzyl Chloride	3.75	4.12	4.11	110	110	70.0-152			0.243	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3836629-1 09/13/22 08:51 • (LCSD) R3836629-2 09/13/22 09:34

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromodichloromethane	3.75	4.29	4.30	114	115	70.0-130			0.233	25
Bromoform	3.75	4.37	4.37	117	117	70.0-130			0.000	25
Bromomethane	3.75	3.75	4.12	100	110	70.0-130			9.40	25
1,3-Butadiene	3.75	5.22	5.34	139	142	70.0-130	J4	J4	2.27	25
Carbon disulfide	3.75	4.30	4.31	115	115	70.0-130			0.232	25
Carbon tetrachloride	3.75	4.31	4.35	115	116	70.0-130			0.924	25
Chlorobenzene	3.75	4.19	4.20	112	112	70.0-130			0.238	25
Chloroethane	3.75	4.19	5.26	112	140	70.0-130		J4	22.6	25
Chloroform	3.75	4.20	4.15	112	111	70.0-130			1.20	25
Chloromethane	3.75	4.05	4.03	108	107	70.0-130			0.495	25
2-Chlorotoluene	3.75	4.30	4.30	115	115	70.0-130			0.000	25
Dibromochloromethane	3.75	4.38	4.40	117	117	70.0-130			0.456	25
1,2-Dibromoethane	3.75	4.30	4.30	115	115	70.0-130			0.000	25
1,2-Dichlorobenzene	3.75	4.21	4.22	112	113	70.0-130			0.237	25
1,3-Dichlorobenzene	3.75	4.25	4.26	113	114	70.0-130			0.235	25
1,4-Dichlorobenzene	3.75	4.40	4.36	117	116	70.0-130			0.913	25
1,2-Dichloroethane	3.75	4.18	4.22	111	113	70.0-130			0.952	25
1,1-Dichloroethane	3.75	4.26	4.24	114	113	70.0-130			0.471	25
1,1-Dichloroethene	3.75	4.25	4.24	113	113	70.0-130			0.236	25
cis-1,2-Dichloroethene	3.75	4.25	4.26	113	114	70.0-130			0.235	25
trans-1,2-Dichloroethene	3.75	4.27	4.26	114	114	70.0-130			0.234	25
1,2-Dichloropropane	3.75	4.08	4.13	109	110	70.0-130			1.22	25
cis-1,3-Dichloropropene	3.75	4.20	4.19	112	112	70.0-130			0.238	25
trans-1,3-Dichloropropene	3.75	4.30	4.28	115	114	70.0-130			0.466	25
1,4-Dioxane	3.75	3.57	3.52	95.2	93.9	70.0-140			1.41	25
Ethanol	3.75	4.59	5.90	122	157	55.0-148		J4	25.0	25
Ethylbenzene	3.75	4.28	4.29	114	114	70.0-130			0.233	25
4-Ethyltoluene	3.75	4.38	4.38	117	117	70.0-130			0.000	25
Trichlorofluoromethane	3.75	4.27	4.93	114	131	70.0-130		J4	14.3	25
Dichlorodifluoromethane	3.75	4.17	4.25	111	113	64.0-139			1.90	25
1,1,2-Trichlorotrifluoroethane	3.75	4.33	4.31	115	115	70.0-130			0.463	25
1,2-Dichlorotetrafluoroethane	3.75	4.26	4.27	114	114	70.0-130			0.234	25
Hexachloro-1,3-butadiene	3.75	4.34	4.34	116	116	70.0-151			0.000	25
Isopropylbenzene	3.75	4.21	4.21	112	112	70.0-130			0.000	25
Methylene Chloride	3.75	4.06	4.04	108	108	70.0-130			0.494	25
Methyl Butyl Ketone	3.75	3.80	3.83	101	102	70.0-149			0.786	25
Methyl Ethyl Ketone	3.75	4.33	4.36	115	116	70.0-130			0.690	25
4-Methyl-2-pentanone (MIBK)	3.75	3.91	3.93	104	105	70.0-139			0.510	25
Methyl Methacrylate	3.75	4.19	4.22	112	113	70.0-130			0.713	25
MTBE	3.75	4.16	4.13	111	110	70.0-130			0.724	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3836629-1 09/13/22 08:51 • (LCSD) R3836629-2 09/13/22 09:34

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Naphthalene	3.75	4.14	4.13	110	110	70.0-159			0.242	25
2-Propanol	3.75	4.07	4.09	109	109	70.0-139			0.490	25
Propene	3.75	4.10	4.02	109	107	64.0-144			1.97	25
Styrene	3.75	4.34	4.37	116	117	70.0-130			0.689	25
1,1,2,2-Tetrachloroethane	3.75	4.14	4.15	110	111	70.0-130			0.241	25
Tetrachloroethylene	3.75	4.22	4.24	113	113	70.0-130			0.473	25
Tetrahydrofuran	3.75	3.93	3.87	105	103	70.0-137			1.54	25
1,2,4-Trichlorobenzene	3.75	3.92	3.86	105	103	70.0-160			1.54	25
1,1,1-Trichloroethane	3.75	4.31	4.29	115	114	70.0-130			0.465	25
1,1,2-Trichloroethane	3.75	4.19	4.22	112	113	70.0-130			0.713	25
Trichloroethylene	3.75	4.23	4.22	113	113	70.0-130			0.237	25
1,2,4-Trimethylbenzene	3.75	4.36	4.35	116	116	70.0-130			0.230	25
1,3,5-Trimethylbenzene	3.75	4.30	4.30	115	115	70.0-130			0.000	25
2,2,4-Trimethylpentane	3.75	4.14	4.15	110	111	70.0-130			0.241	25
Vinyl chloride	3.75	4.79	4.84	128	129	70.0-130			1.04	25
Vinyl Bromide	3.75	4.27	4.81	114	128	70.0-130			11.9	25
Vinyl acetate	3.75	4.03	3.93	107	105	70.0-130			2.51	25
m&p-Xylene	7.50	8.56	8.55	114	114	70.0-130			0.117	25
o-Xylene	3.75	4.19	4.20	112	112	70.0-130			0.238	25
1,1-Difluoroethane	3.75	4.57	4.55	122	121	70.0-130			0.439	25
1,2,3-Trimethylbenzene	3.75	4.35	4.33	116	115	70.0-130			0.461	25
Chlorodifluoromethane	3.75	4.26	4.39	114	117	70.0-130			3.01	25
Ethyl acetate	3.75	4.73	4.73	126	126	70.0-130			0.000	25
Tert-Amyl Ethyl Ether	3.75	4.12	4.09	110	109	70.0-130			0.731	25
(S) 1,4-Bromofluorobenzene				*99.1*	*99.3*	*60.0-140*				

Method Blank (MB)

(MB) R3837083-3 09/14/22 09:45

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Cyclohexane	U		0.0753	0.200
Heptane	U		0.104	0.200
n-Hexane	U		0.206	0.630
Toluene	U		0.0870	0.500
TPH (GC/MS) Low Fraction	61.7	J	39.7	200
Methyl Cyclohexane	U		0.0813	0.200
(S) 1,4-Bromofluorobenzene	*95.6*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3837083-1 09/14/22 08:47 • (LCSD) R3837083-2 09/14/22 09:17

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyclohexane	3.75	3.95	4.07	105	109	70.0-130			2.99	25
Heptane	3.75	4.12	4.23	110	113	70.0-130			2.63	25
n-Hexane	3.75	4.18	4.30	111	115	70.0-130			2.83	25
Toluene	3.75	3.93	4.05	105	108	70.0-130			3.01	25
TPH (GC/MS) Low Fraction	203	252	256	124	126	70.0-130			1.57	25
Methyl Cyclohexane	3.75	4.16	4.23	111	113	70.0-130			1.67	25
(S) 1,4-Bromofluorobenzene				*102*	*102*	*60.0-140*				

Method Blank (MB)

(MB) R3836475-3 09/13/22 09:41

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Oxygen	2.25		0.225	5.00
Carbon Monoxide	U		0.665	2.00
Carbon Dioxide	U		0.121	0.500
Methane	U		0.0584	0.400

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3836475-1 09/13/22 09:35 • (LCSD) R3836475-2 09/13/22 09:38

Analyte	Spike Amount %	LCS Result %	LCSD Result %	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Oxygen	20.0	18.9	18.9	94.5	94.5	70.0-130			0.000	20
Carbon Monoxide	2.50	2.52	2.50	101	100	70.0-130			0.797	20
Carbon Dioxide	2.50	2.65	2.65	106	106	70.0-130			0.000	20
Methane	2.00	2.17	2.19	109	110	70.0-130			0.917	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J4	The associated batch QC was outside the established quality control range for accuracy.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

A098

SUB CONTRATOR: Pace TN	COMPANY: PACE TN	PHONE: (800) 767-5859	FAX: (615) 758-5859
ADDRESS: 12065 Lebanon Rd		ACCOUNT #:	EMAIL:
CITY, STATE, ZIP: Mt. Juliet, TN 37122			

L1533401

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2209235-001A	SVE-1	TEDLAR	Air	9/6/2022 11:30:00 AM	2	CO2, Oxygen, TO-15 + TPH 01

5285 8093 3319
Amb

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N		

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: 9/7/2022	Time: 9:44 AM	Received By:	Date: 9/8/22	Time: 900
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: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Hilcorp Energy | Work Order Number: 2209235 | RcptNo: 1

Received By: Tracy Casarrubias 9/7/2022 7:30:00 AM

Completed By: Tracy Casarrubias 9/7/2022 9:31:54 AM

Reviewed By: 9-7-22

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: JA 9/7/22

Special Handling (if applicable)

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

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °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)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: SJ 28-7 Unit 183M

Project #:

Project Manager: Kate Kaufman

Sampler: Brandon Sinclair

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 1.8 - 0.1 = 1.7 (°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. 2209235	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)	TO-15 VOC	TO-15 TPH & GRO	O_2 & CO_2 D1946			
9-6	1130	air	SVE-1	2 Tedlar		001											✓	✓	✓			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time	Remarks:
9-6	1624				9/6/22	1624	
9/6/22	1809				9/7/22	7:30	

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

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 150952
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See app ID 175851 for most updated status.	2/28/2023