

NV



October 10, 2022

New Mexico Oil Conservation Division

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

Re: Third Quarter 2022 – Solar SVE System Update

Bell Federal GC B#1
San Juan County, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NCS1729355513
Ensolum Project No. 07A1988001

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Third Quarter 2022 – Solar SVE System Update* report summarizing the solar soil vapor extraction (SVE) system performance at the Bell Federal GC B#1 natural gas production well (Site), located in Section 11, Township 30 North, Range 13 West in San Juan County, New Mexico (Figure 1). The SVE system has operated since January 16, 2018 to remediate subsurface soil impacts originating from a release of approximately 58 barrels (bbls) of natural gas condensate caused by an act of vandalism. This report summarizes Site activities performed in July, August, and September of 2022 to the New Mexico Oil Conservation Division (NMOCD).

SVE SYSTEM SPECIFICATIONS

Currently, a solar SVE system is operating at the Site, which consists of a 1/3-horsepower blower capable of producing 22 cubic feet per minute (cfm) flow at a vacuum of 29 inches of water column (IWC); three solar panels, with a total of 915 watts of maximum power output; and charged by four 12-volt deep cycle batteries that subsequently power the SVE blower. The system operation is controlled by a timer adjusted throughout the year based on available nominal daylight hours (generally 9 hours per day during the winter and 14 hours per day during the summer). Four SVE wells (SVE01 through SVE04) are currently present at the Site as depicted on Figure 2.

THIRD QUARTER 2022 ACTIVITIES

During the third quarter of 2022, Ensolum and Hilcorp personnel performed bi-weekly operation and maintenance (O&M) visits to verify the system was operating as designed and to perform any required maintenance. During Site visits, the system timer and the angle of the solar panels were adjusted to account for seasonal variations and maximize system efficiency. Field notes collected during O&M visits are presented in Appendix A.

During the third quarter of 2022, operating SVE wells were rotated so vacuum on the vadose zone within two wells at a time to induce air flow in the impacted zones at the Site. Between June 16 and September 21, 2022, approximately 1,299 total hours of nominal daylight were available for the solar SVE system to operate. Available nominal daylight hours are based on estimates by the National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS) for the Site location. Between these dates, the actual runtime for the system was 1,452 hours, equating to a third quarter 2022 runtime efficiency of 111.8 percent (%). For solar SVE systems, runtime efficiency can be greater than 100% when the solar panels charge the system's batteries during daylight hours and continue to run the SVE blower for a longer duration of time than the nominal daylight hours available at the Site due to excess energy stored in the batteries. Table 1 presents the SVE system runtime compared to nominal available daylight hours per month. Appendix B presents photographs of the runtime meter for calculating the third quarter runtime efficiency.

A third quarter 2022 emissions sample was collected on September 8, 2022 from a sample port located between the SVE piping manifold and the SVE blower using a high vacuum air sampler. Prior to collection, the emission sample was field screened with a photoionization detector (PID) for organic vapor monitoring (OVM). The emission sample was collected directly into two 1-Liter Tedlar® bags and analyzed by Pace Analytical for analysis of total volatile petroleum hydrocarbons (TVPH – also known as total petroleum hydrocarbons – gasoline range organics (TPH-GRO)) and volatile organic compounds (VOCs) following Environmental Protection Agency (EPA) Method TO-15, as well as fixed gas analysis of oxygen and carbon dioxide following American Society for Testing and Materials (ASTM) Method D-1946. Table 2 presents a summary of analytical data collected during this sampling event and historical sampling events, with the full laboratory analytical report included in Appendix C. Air sample data and measured stack flow rates are used to estimate total mass recovered and total emissions generated by the SVE system (Table 3). Based on these estimates, 40,470 pounds (20 tons) of TVPH have been removed by the system to date.

Of note, air samples collected by Hilcorp during the third quarter 2022 sampling event were incidentally analyzed for TVPH and VOCs by EPA Method TO-15 instead of EPA Methods 8015D and 8260B, respectively. As presented in the document titled *A Comparison between EPA Compendium Method TO-15 and EPA Method 8260B for VOC Determination in Soil Gas* (Hayes, Benton, Grewal, and Khan, 2005), EPA Methods TO-15 and 8260B generate comparable results for the compounds studied. Additionally, the document concluded that TO-15 analysis generally outperforms EPA Method 8260 analysis when comparing recovery rates, reporting limits, and calibration results. As such, the use of EPA Method TO-15 for analysis of TVPH and VOCs is acceptable for the purposes of assessing quarterly air concentrations and calculating emissions generated from the SVE system at the Site.

RECOMMENDATIONS

Bi-weekly O&M visits will continue to be performed by Ensolum and/or Hilcorp personnel to verify the SVE system is operating within normal working ranges (i.e., temperature, pressure, and vacuum). Deviations from regular operations will be noted on field logs and included in the following quarterly report. Additionally, the fourth quarter 2022 air sample will be analyzed by EPA Methods 8015D and 8260B for TVPH and VOCs, respectively, in order to be consistent with historical sampling events.

Hilcorp will continue operating the SVE until asymptotic conditions are observed. At that time, an evaluation of residual petroleum hydrocarbons will be assessed and further recommendations for remedial actions, if any, will be provided to NMOCD.

Hilcorp Energy Company
Bell Federal GC B#1
October 10, 2022



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

Sincerely,
Ensolum, LLC

A handwritten signature in black ink, appearing to read "SH", is positioned above the contact information for Stuart Hyde.

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

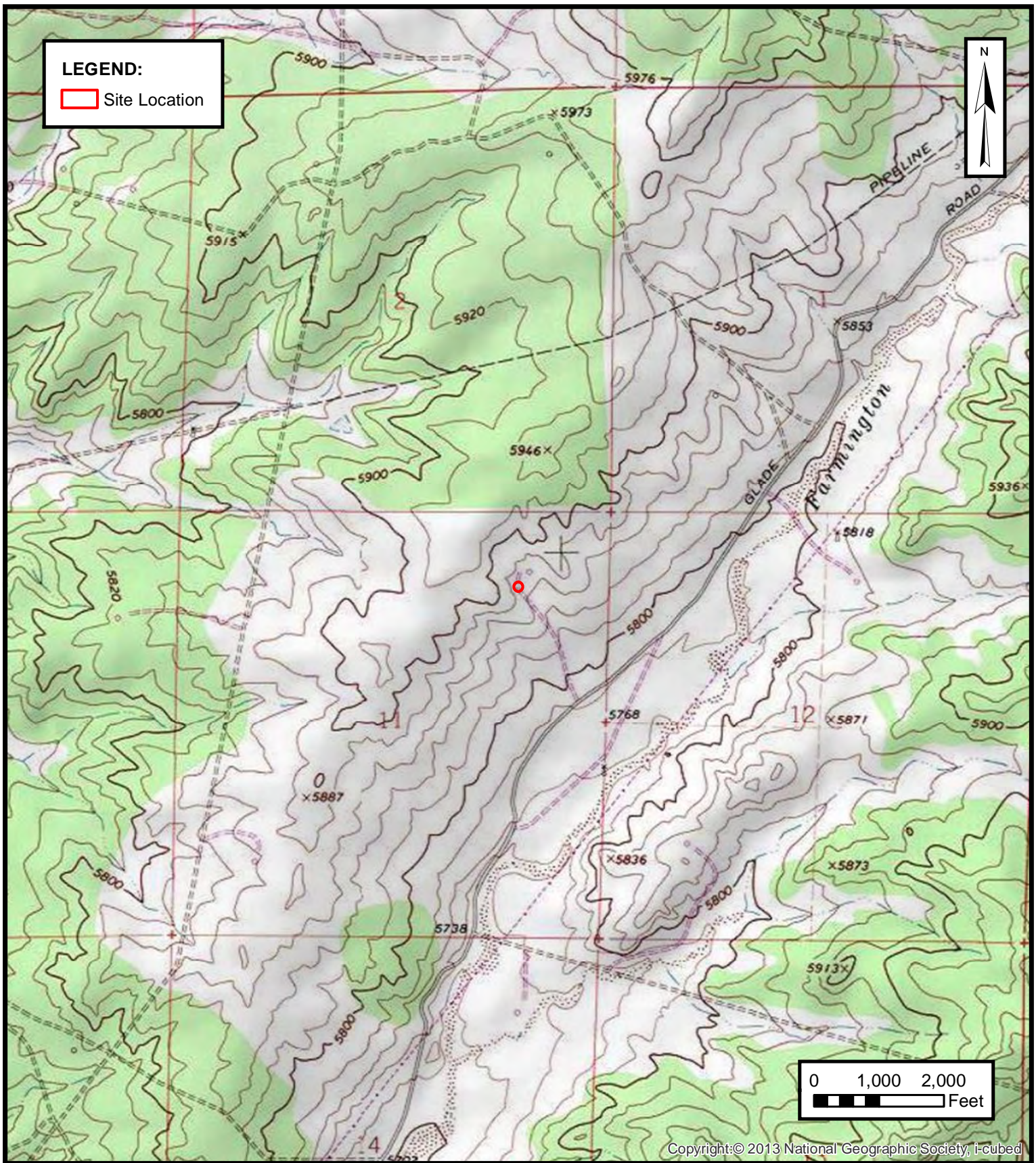
A handwritten signature in black ink, appearing to read "DM", is positioned above the contact information for Daniel R. Moir.

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

Figure 1	Site Location
Figure 2	SVE System Configuration
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
Appendix A	Field Notes
Appendix B	Project Photographs
Appendix C	Laboratory Analytical Reports



FIGURES



ENSOLUM

Environmental & Hydrogeologic Consultants

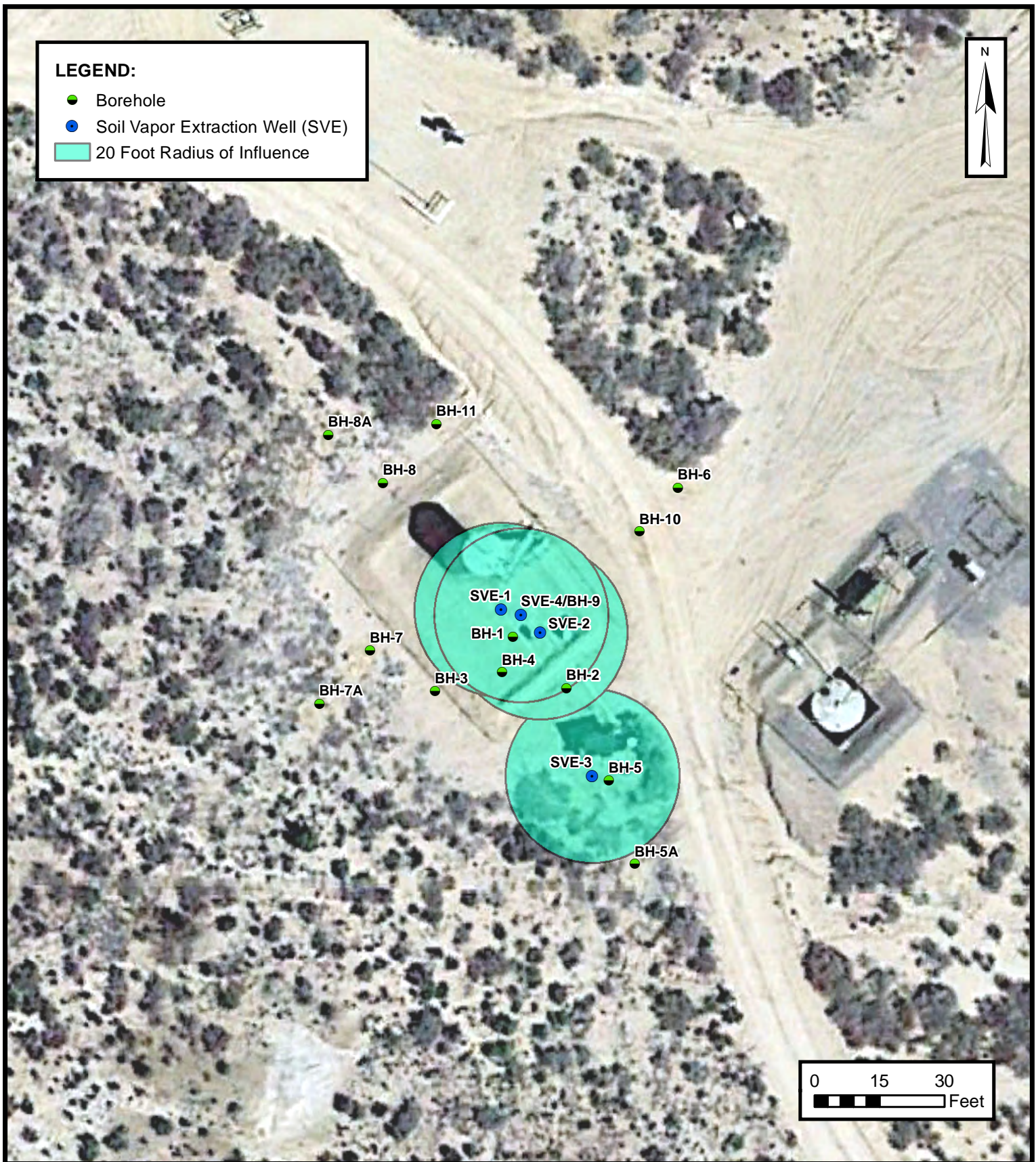
SITE LOCATION

HILCORP ENERGY COMPANY
 BELL FEDERAL GC B#1
 NENE SEC 11 T30N R13W, San Juan County, New Mexico
 36.893345° N, 107.899185° W

PROJECT NUMBER: 07A1988001

FIGURE

1



SVE SYSTEM CONFIGURATION

HILCORP ENERGY COMPANY
BELL FEDERAL GC B#1
NENE SEC 11 T30N R13W, San Juan County, New Mexico
36.893345° N, 107.899185° W

PROJECT NUMBER: 07A1988001

FIGURE
2



TABLES



TABLE 1
SOIL VAPOR EXTRACTION SYSTEM RUNTIME CALCULATIONS

Hilcorp Energy Company - Bell Federal GC B#1

San Juan County, New Mexico

Ensolum Project No. 07A1988001

Date	Total Operational Hours	Delta Hours
6/16/2022	15,733.8	---
9/21/2022	17,186.4	1,452.6

Time Period	June 16 to June 30, 2022	July 1 to July 31, 2022	August 1 to August 31, 2022	September 1 to September 21, 2022
Days	15	31	31	21
Avg. Nominal Daylight Hours	14	14	13	12
Available Runtime Hours	210	434	403	252

Quarterly Available Daylight Runtime Hours **1,299**
 Quarterly Runtime Hours **1,452.6**
 Quarterly % Runtime **111.8%**

Month	Days	Nominal Daylight Hours	Total Month Hours
January	31	10	310
February	28	10	280
March	31	11	341
April	30	12	360
May	31	13	403
June	30	14	420
July	31	14	434
August	31	13	403
September	30	12	360
October	31	11	341
November	30	10	300
December	31	9	279



TABLE 2
SOIL VAPOR EXTRACTION SYSTEM EMISSIONS ANALYTICAL RESULTS

Hilcorp Energy Company - Bell Federal GC B#1
San Juan County, New Mexico

Ensolum Project No. 07A1988001

Date	Inlet PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH/GRO (µg/L)	Oxygen (%)	Carbon Dioxide (%)
1/24/2018	1,435	280	200	<5.0	38.0	30,000	--	--
8/17/2018	1,873	160	380	21.0	320	18,000	--	--
3/22/2019	1,607	490	920	24.0	480	NA	--	--
6/18/2019	1,026	72.0	270	27.0	290	NA	--	--
9/25/2019	1,762	220	480	21.0	440	35,000	--	--
12/16/2019	1,902	130	840	21.0	220	22,000	--	--
3/10/2020	1,171	120	380	19.0	330	31,000	--	--
6/25/2020	978.0	180	430	25.0	480	45,000	--	--
9/16/2020	1,766	186	433	18.0	497	32,100	18.2%	3.29%
12/8/2020	1,741	114	292	10.6	324	16,000	17.3%	4.45%
3/23/2021	1,252	45	86.3	2.3	95.4	7,930	20.2%	<0.500%
6/10/2021	165.8	8.5	20	<0.50	20.0	5,700	17.3%	2.21%
9/8/2021	NM	130	240	5.9	150	33,000	--	--
12/15/2021	1,374	95	160	11.0	220	24,098	16.3%	3.32%
3/16/2022	1,096	53	120	<0.50	82	26,000	16.8%	3.01%
6/16/2022	708	24	69	<5.0	38	13,000	21.0%	0.82%
9/8/2022	545	50.2	129	4.99	612	10,500	17.7%	2.80%

Notes:

GRO: gasoline range hydrocarbons

µg/L: microgram per liter

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

%: percent

--: not sampled

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



TABLE 3
SOIL VAPOR EXTRACTION SYSTEM MASS REMOVAL AND EMISSIONS
Hilcorp Energy Company - Bell Federal GC B#1
San Juan County, New Mexico

Ensolum Project No. 07A1988001

Flow and Laboratory Analysis						
Date	Inlet PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
1/24/2018	1,435	280	200	5.0	38	30,000
8/17/2018	1,873	160	380	21	320	18,000
3/22/2019	1,607	490	920	24	480	--
6/18/2019	1,026	72	270	27	290	--
9/25/2019	1,762	220	480	21	440	35,000
12/16/2019	1,902	130	840	21	220	22,000
3/10/2020	1,171	120	380	19	330	31,000
6/25/2020	978	180	430	25	480	45,000
9/16/2020	1,766	186	433	18	497	32,100
12/8/2020	1,741	114	292	11	324	16,000
3/23/2021	1,252	45	86	2	95	7,930
6/10/2021	166	9	20	0.50	20	5,700
9/8/2021	--	130	240	6	150	33,000
12/15/2021	1,374	95	160	11	220	24,098
3/16/2022	1,096	53	120	0.50	82	26,000
6/16/2022	708	24	69	5.00	38	13,000
9/8/2022	545	50	129	4.99	612	10,500
Average	1,275	139	321	13	273	23,289

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)
1/24/2018	40	164,400	164,400	0.042	0.030	0.001	0.0057	4.5
8/17/2018	33	5,240,130	5,075,730	0.027	0.036	0.0016	0.022	3.0
3/22/2019	32	9,176,130	3,936,000	0.039	0.078	0.0027	0.048	--
6/18/2019	32	11,096,130	1,920,000	0.034	0.071	0.0031	0.046	--
9/25/2019	33	13,610,730	2,514,600	0.018	0.046	0.0030	0.045	3.3
12/16/2019	32	15,513,450	1,902,720	0.021	0.079	0.0025	0.039	3.4
3/10/2020	29	17,246,490	1,733,040	0.014	0.066	0.0022	0.030	2.9
6/25/2020	29	19,123,950	1,877,460	0.016	0.044	0.0024	0.044	4.1
9/16/2020	31	20,825,850	1,701,900	0.021	0.050	0.0025	0.057	4.5
12/8/2020	30	22,049,850	1,224,000	0.017	0.041	0.0016	0.046	2.7
3/23/2021	30	23,122,650	1,072,800	0.0089	0.021	0.00073	0.024	1.3
6/10/2021	33	23,514,690	392,040	0.0033	0.0066	0.00017	0.0071	0.84
9/8/2021	33	23,831,490	316,800	0.0085	0.0160	0.00039	0.010	2.4
12/15/2021	33	26,136,210	2,304,720	0.014	0.025	0.0010	0.023	3.5
3/16/2022	33	27,701,202	1,564,992	0.0091	0.017	0.00071	0.019	3.1
6/16/2022	25	29,520,102	1,818,900	0.0036	0.009	0.00026	0.0056	1.8
9/8/2022	31	31,835,244	2,315,142	0.0043	0.011	0.00058	0.038	1.4
Average				0.018	0.038	0.0015	0.030	2.8

Flow and Laboratory Analysis								
Date	Total SVE System Hours	Delta Hours	Benzene (pounds)	Toluene (pounds)	Ethylbenzene (pounds)	Total Xylenes (pounds)	TVPH (pounds)	TVPH (tons)
1/24/2018	69	69	2.9	2.0	0.051	0.39	307	0.15
8/17/2018	2,632	2,564	70	92	4.1	57	7,593	3.8
3/22/2019	4,682	2,050	80	159	5.5	98	--	--
6/18/2019	5,682	1,000	33.6	71	3.1	46	--	--
9/25/2019	6,952	1,270	23	59	3.8	57	4,154	2.1
12/16/2019	7,943	991	21	78	2.5	39	3,380	1.7
3/10/2020	8,939	996	14	66	2.2	30	2,863	1.4
6/25/2020	10,018	1,079	18	47	2.6	47	4,447	2.2
9/16/2020	10,933	915	19	46	2.3	52	4,090	2.0
12/8/2020	11,613	680	11.4	28	1.1	31	1,835	0.92
3/23/2021	12,209	596	5.3	12.6	0.43	14.0	800	0.40
6/10/2021	12,407	198	0.66	1.30	0.035	1.41	167	0.083
9/8/2021	12,567	160	1.4	2.6	0.06	1.7	382	0.19
12/15/2021	13,731	1,164	16	29	1.2	27	4,101	2.1
3/16/2022	14,521	790	7.2	14	0.561	14.7	2,444	1.2
6/16/2022	15,734	1,213	4.4	11	0.31	6.8	2,211	1.1
9/8/2022	16,979	1,245	5.4	14	0.72	46.9	1,696	0.8
Total Mass Recovery to Date			332	732	30	570	40,470	20

Notes:

cf: cubic feet

cfm: cubic feet per minute

µg/L: micrograms per liter

lb/hr: pounds per hour

--: not sampled

PID: photoionization detector

ppm: parts per million

TVPH: total volatile petroleum hydrocarbons

gray: laboratory reporting limit used for calculating emissions



APPENDIX A

Field Notes

**BELL FEDERAL GC B1 SVE SYSTEM
BIWEEKLY O&M FORM**

DATE: 7/5/22
TIME ONSITE: 1028

O&M PERSONNEL: Reece Hansen
TIME OFFSITE: 1115

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: ☐ KO TANK HIGH LEVEL

			TIMER SETTINGS	
SVE SYSTEM	READING	TIME	Month	Timer Setting
Blower Hours (take photo)	16016.0	1032	January	8 AM to 7 PM
Pre K/O Vacuum (IWC)	17		February	8 AM to 7 PM
Thermal Anemometer Flow (fpm)	3298		March	8 AM to 8 PM
Thermal Anemometer Temp (C)	11.0		April	8 AM to 9 PM
Inlet PID	1441		May	7 AM to 9 PM
Exhaust PID	1216		June	6 AM to 9 PM
Solar Panel Angle	—		July	6 AM to 9 PM
K/O Tank Drum Level	empty		August	7 AM to 9 PM
K/O Liquid Drained (gallons)	NA		September	8 AM to 9 PM
Timer Setting	6 AM to 9 PM		October	8 AM to 8 PM
Heat Trace (on/off)			November	9 AM to 8 PM
			December	8 AM to 6 PM

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID:	SAMPLE TIME:
Analytes: TVPH (8015), VOCs (8260), Fixed Gas (CO/CO2/O2)	
OPERATING WELLS: SVE 2,3	

Change in Well Operation: —

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	ADJUSTMENTS
SVE01			
SVE02			
SVE03			
SVE04			

PRODUCT RECOVERY

LOCATION	DEPTH TO PRODUCT	DEPTH TO WATER	RECOVERED VOLUME	COMMENTS
SVE-1				
SVE-2RS				
SVE-4				
SVE-11S				
SVE-13S				
SVE-14S				

COMMENTS/OTHER MAINTENANCE:

SVE 03 44.45 = DTI 47.93 = DTW
Bailed 11002 PSH from SVE 03

SAUNDERS
www.saunders-usa.comBELL FEDERAL GC B1 SVE SYSTEM
BIWEEKLY O&M FORMDATE: 7-22
TIME ONSITE: _____O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL

			TIMER SETTINGS	
			Month	Timer Setting
SVE SYSTEM			January	8 AM to 7 PM
READING			February	8 AM to 7 PM
TIME			March	8 AM to 8 PM
Blower Hours (take photo)	16269.9	1000	April	8 AM to 9 PM
Pre K/O Vacuum (IWC)	14		May	7 AM to 9 PM
Thermal Anemometer Flow (fpm)	5.18		June	6 AM to 9 PM
Thermal Anemometer Temp (C)	44.6		July	6 AM to 9 PM
Inlet PID	417.1		August	7 AM to 9 PM
Exhaust PID	625.3		September	8 AM to 9 PM
Solar Panel Angle			October	8 AM to 8 PM
K/O Tank Drum Level			November	9 AM to 8 PM
K/O Liquid Drained (gallons)			December	8 AM to 6 PM
Timer Setting				
Heat Trace (on/off)				

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____

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

OPERATING WELLS

Change in Well Operation: _____

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01				
SVE02	56.01			
SVE03	861.5			
SVE04				

PRODUCT RECOVERY

LOCATION	DEPTH TO PRODUCT	DEPTH TO WATER	RECOVERED VOLUM	COMMENTS
SVE-1				
SVE-2RS				
SVE-4				
SVE-11S				
SVE-13S				
SVE-14S				

COMMENTS/OTHER MAINTENANCE:

**BELL FEDERAL GC B1 SVE SYSTEM
BIWEEKLY O&M FORM**DATE: 8-3-22
TIME ONSITE: _____O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____**SVE SYSTEM - MONTHLY O&M**

SVE ALARMS: _____ KO TANK HIGH LEVEL

			TIMER SETTINGS	
SVE SYSTEM	READING	TIME	Month	Timer Setting
Blower Hours (take photo)	16451.1		January	8 AM to 7 PM
Pre K/O Vacuum (IWC)	16		February	8 AM to 7 PM
Thermal Anemometer Flow (fpm)	532.4		March	8 AM to 8 PM
Thermal Anemometer Temp (C)	46.35		April	8 AM to 9 PM
Inlet PID	679		May	7 AM to 9 PM
Exhaust PID	766		June	6 AM to 9 PM
Solar Panel Angle			July	6 AM to 9 PM
K/O Tank Drum Level			August	7 AM to 9 PM
K/O Liquid Drained (gallons)			September	8 AM to 9 PM
Timer Setting			October	8 AM to 8 PM
Heat Trace (on/off)			November	9 AM to 8 PM
			December	8 AM to 6 PM

SVE SYSTEM - QUARTERLY SAMPLING

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

Change in Well Operation: _____

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01				
SVE02		61.4		
SVE03		1023		
SVE04				

PRODUCT RECOVERY

LOCATION	DEPTH TO PRODUCT	DEPTH TO WATER	RECOVERED VOLUME	COMMENTS
SVE-1				
SVE-2RS				
SVE-4				
SVE-11S				
SVE-13S				
SVE-14S				

COMMENTS/OTHER MAINTENANCE:

**BELL FEDERAL GC B1 SVE SYSTEM
BIWEEKLY O&M FORM**DATE: 8-18
TIME ONSITE: _____O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____**SVE SYSTEM - MONTHLY O&M**

SVE ALARMS: _____ KO TANK HIGH LEVEL _____

			TIMER SETTINGS	
			Month	Timer Setting
SVE SYSTEM	READING	TIME	January	8 AM to 7 PM
Blower Hours (take photo)	16676.3	1225	February	8 AM to 7 PM
Pre K/O Vacuum (IWC)	16		March	8 AM to 8 PM
Thermal Anemometer Flow (fpm)	1429		April	8 AM to 9 PM
Thermal Anemometer Temp (C)	35.15		May	7 AM to 9 PM
Inlet PID	595		June	6 AM to 9 PM
Exhaust PID	479		July	6 AM to 9 PM
Solar Panel Angle			August	7 AM to 9 PM
K/O Tank Drum Level			September	8 AM to 9 PM
K/O Liquid Drained (gallons)			October	8 AM to 8 PM
Timer Setting			November	9 AM to 8 PM
Heat Trace (on/off)			December	8 AM to 6 PM

SVE SYSTEM - QUARTERLY SAMPLING

SAMPLE ID: _____ SAMPLE TIME: _____

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

OPERATING WELLS _____

Change in Well Operation: _____

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01				
SVE02		92.3		
SVE03		95.2		
SVE04				

PRODUCT RECOVERY

LOCATION	DEPTH TO PRODUCT	DEPTH TO WATER	RECOVERED VOLUM	COMMENTS
SVE-1				
SVE-2RS				
SVE-4				
SVE-11S				
SVE-13S				
SVE-14S				

COMMENTS/OTHER MAINTENANCE: _____

BELL FEDERAL GC B1 SVE SYSTEM
BIWEEKLY O&M FORM

DATE: 9-7
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL

			TIMER SETTINGS	
SVE SYSTEM	READING	TIME	Month	Timer Setting
Blower Hours (take photo)	16978.7	1531	January	8 AM to 7 PM
Pre K/O Vacuum (IWC)	16		February	8 AM to 7 PM
Thermal Anemometer Flow (fpm)	1614		March	8 AM to 8 PM
Thermal Anemometer Temp (C)	45.25		April	8 AM to 9 PM
Inlet PID	545		May	7 AM to 9 PM
Exhaust PID	735		June	6 AM to 9 PM
Solar Panel Angle			July	6 AM to 9 PM
K/O Tank Drum Level			August	7 AM to 9 PM
K/O Liquid Drained (gallons)			September	8 AM to 9 PM
Timer Setting			October	8 AM to 8 PM
Heat Trace (on/off)			November	9 AM to 8 PM
			December	8 AM to 6 PM

SVE SYSTEM - QUARTERLY SAMPLING

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

Change in Well Operation: _____

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01				
SVE02		69.8		
SVE03		582		
SVE04				

PRODUCT RECOVERY

LOCATION	DEPTH TO PRODUCT	DEPTH TO WATER	RECOVERED VOLUME	COMMENTS
SVE-1				
SVE-2RS				
SVE-4				
SVE-11S				
SVE-13S				
SVE-14S				

COMMENTS/OTHER MAINTENANCE:

Communication issue (sygnet)

BELL FEDERAL GC B1 SVE SYSTEM
BIWEEKLY O&M FORM

DATE: 9-21-22
TIME ONSITE: _____

O&M PERSONNEL: B Sinclair
TIME OFFSITE: _____

SVE SYSTEM - MONTHLY O&M

SVE ALARMS: _____ KO TANK HIGH LEVEL _____

			TIMER SETTINGS	
SVE SYSTEM	READING	TIME	Month	Timer Setting
Blower Hours (take photo)	17186.4	1347	January	8 AM to 7 PM
Pre K/O Vacuum (IWC)	18		February	8 AM to 7 PM
Thermal Anemometer Flow (fpm)	1463		March	8 AM to 8 PM
Thermal Anemometer Temp (C)	28.35		April	8 AM to 9 PM
Inlet PID	660		May	7 AM to 9 PM
Exhaust PID	1014		June	6 AM to 9 PM
Solar Panel Angle			July	6 AM to 9 PM
K/O Tank Drum Level			August	7 AM to 9 PM
K/O Liquid Drained (gallons)			September	8 AM to 9 PM
Timer Setting			October	8 AM to 8 PM
Heat Trace (on/off)			November	9 AM to 8 PM
			December	8 AM to 6 PM

SVE SYSTEM - QUARTERLY SAMPLING

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

Change in Well Operation:

LOCATION	VACUUM (IWC)	PID HEADSPACE (PPM)	FLOW (CFM)	ADJUSTMENTS
SVE01				
SVE02		113		
SVE03		933		
SVE04				

PRODUCT RECOVERY

LOCATION	DEPTH TO PRODUCT	DEPTH TO WATER	RECOVERED VOLUME	COMMENTS
SVE-1				
SVE-2RS				
SVE-4				
SVE-11S				
SVE-13S				
SVE-14S				

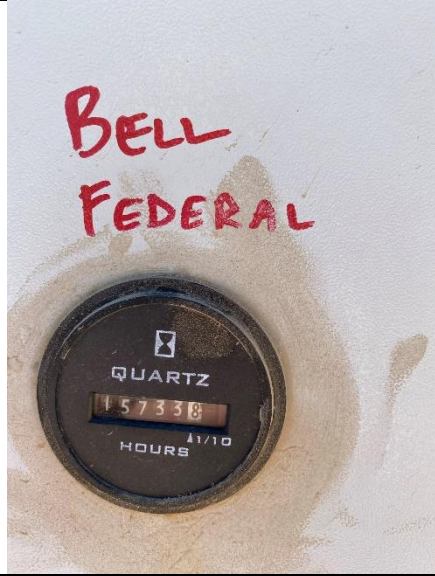

COMMENTS/OTHER MAINTENANCE:



APPENDIX B

Project Photographs

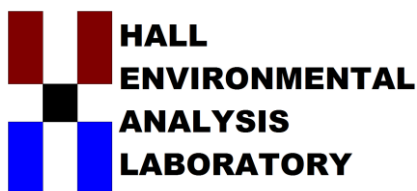
PROJECT PHOTOGRAPHS
Bell Federal GC B#1
San Juan County, New Mexico
Hilcorp Energy Company

Photograph 1 Runtime meter taken on June 16, 2022 at 12:30 PM Hours = 15,733.8	
Photograph 2 Runtime meter taken on September 21, 2022 at 1:47 PM Hours = 17,186.4	 <p>DIRECTION 36.83212°N ACCURACY 4 m 140 deg(T) 108.16895°W DATUM WGS84</p> <p>Blower Hours Bell Federal GC 2022-09-21 B1 13:47:52-06:00</p>



APPENDIX C

Laboratory Analytical Reports



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

September 19, 2022

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

RE: Bell Fed GC B1

OrderNo.: 2209433

Dear Mitch Killough:

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

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

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

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

Sincerely,

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

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109



ANALYTICAL REPORT

September 16, 2022

Hall Environmental Analysis Laboratory

Sample Delivery Group: L1534920

Samples Received: 09/13/2022

Project Number:

Description:

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

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Entire Report Reviewed By:

A handwritten signature in blue ink that reads "John V. Hawkins".

John Hawkins
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

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

Cp: Cover Page	1	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
2209433-001A SVE-1 L1534920-01	5	⁴ Cn
Qc: Quality Control Summary	7	
Volatile Organic Compounds (MS) by Method TO-15	7	⁵ Sr
Organic Compounds (GC) by Method D1946	12	⁶ Qc
Gl: Glossary of Terms	13	⁷ Gl
Al: Accreditations & Locations	14	⁸ Al
Sc: Sample Chain of Custody	15	⁹ Sc

SAMPLE SUMMARY

2209433-001A SVE-1 L1534920-01 Air

Collected by
Collected date/time
Received date/time

09/08/22 15:00 09/13/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1925454	100	09/14/22 02:04	09/14/22 02:04	CEP	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1927061	5000	09/15/22 18:44	09/15/22 18:44	SDS	Mt. Juliet, TN
Organic Compounds (GC) by Method D1946	WG1926699	1	09/15/22 14:33	09/15/22 14:33	JAP	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

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.

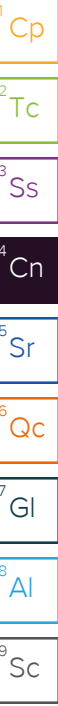


John Hawkins
Project Manager

Sample Delivery Group (SDG) Narrative

Sample received in tedlar bag.

<u>Lab Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
L1534920-01	2209433-001A SVE-1	TO-15, 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	ND	ND		100	WG1925454
Allyl chloride	107-05-1	76.53	20.0	62.6	ND	ND		100	WG1925454
Benzene	71-43-2	78.10	1000	3190	15700	50200	Q	5000	WG1927061
Benzyl Chloride	100-44-7	127	20.0	104	ND	ND		100	WG1925454
Bromodichloromethane	75-27-4	164	20.0	134	ND	ND		100	WG1925454
Bromoform	75-25-2	253	60.0	621	ND	ND		100	WG1925454
Bromomethane	74-83-9	94.90	20.0	77.6	ND	ND		100	WG1925454
1,3-Butadiene	106-99-0	54.10	200	443	ND	ND		100	WG1925454
Carbon disulfide	75-15-0	76.10	20.0	62.2	ND	ND		100	WG1925454
Carbon tetrachloride	56-23-5	154	20.0	126	ND	ND		100	WG1925454
Chlorobenzene	108-90-7	113	20.0	92.4	ND	ND		100	WG1925454
Chloroethane	75-00-3	64.50	20.0	52.8	ND	ND		100	WG1925454
Chloroform	67-66-3	119	20.0	97.3	ND	ND		100	WG1925454
Chloromethane	74-87-3	50.50	20.0	41.3	ND	ND		100	WG1925454
2-Chlorotoluene	95-49-8	126	20.0	103	ND	ND		100	WG1925454
Cyclohexane	110-82-7	84.20	1000	3440	287000	988000	Q	5000	WG1927061
Dibromochloromethane	124-48-1	208	20.0	170	ND	ND		100	WG1925454
1,2-Dibromoethane	106-93-4	188	20.0	154	ND	ND		100	WG1925454
1,2-Dichlorobenzene	95-50-1	147	20.0	120	ND	ND		100	WG1925454
1,3-Dichlorobenzene	541-73-1	147	20.0	120	ND	ND		100	WG1925454
1,4-Dichlorobenzene	106-46-7	147	20.0	120	ND	ND		100	WG1925454
1,2-Dichloroethane	107-06-2	99	20.0	81.0	ND	ND		100	WG1925454
1,1-Dichloroethane	75-34-3	98	20.0	80.2	ND	ND		100	WG1925454
1,1-Dichloroethene	75-35-4	96.90	20.0	79.3	ND	ND		100	WG1925454
cis-1,2-Dichloroethene	156-59-2	96.90	20.0	79.3	ND	ND		100	WG1925454
trans-1,2-Dichloroethene	156-60-5	96.90	20.0	79.3	ND	ND		100	WG1925454
1,2-Dichloropropane	78-87-5	113	20.0	92.4	ND	ND		100	WG1925454
cis-1,3-Dichloropropene	10061-01-5	111	20.0	90.8	ND	ND		100	WG1925454
trans-1,3-Dichloropropene	10061-02-6	111	20.0	90.8	ND	ND		100	WG1925454
1,4-Dioxane	123-91-1	88.10	20.0	72.1	ND	ND		100	WG1925454
Ethanol	64-17-5	46.10	125	236	1330	2510		100	WG1925454
Ethylbenzene	100-41-4	106	20.0	86.7	1150	4990		100	WG1925454
4-Ethyltoluene	622-96-8	120	20.0	98.2	841	4130		100	WG1925454
Trichlorofluoromethane	75-69-4	137.40	20.0	112	ND	ND		100	WG1925454
Dichlorodifluoromethane	75-71-8	120.92	20.0	98.9	ND	ND		100	WG1925454
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	20.0	153	ND	ND		100	WG1925454
1,2-Dichlorotetrafluoroethane	76-14-2	171	20.0	140	ND	ND		100	WG1925454
Heptane	142-82-5	100	1000	4090	77500	317000	Q	5000	WG1927061
Hexachloro-1,3-butadiene	87-68-3	261	63.0	673	ND	ND		100	WG1925454
n-Hexane	110-54-3	86.20	3150	11100	249000	878000	Q	5000	WG1927061
Isopropylbenzene	98-82-8	120.20	20.0	98.3	184	905		100	WG1925454
Methylene Chloride	75-09-2	84.90	20.0	69.4	ND	ND		100	WG1925454
Methyl Butyl Ketone	591-78-6	100	125	511	ND	ND		100	WG1925454
2-Butanone (MEK)	78-93-3	72.10	125	369	ND	ND		100	WG1925454
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	125	512	ND	ND		100	WG1925454
Methyl methacrylate	80-62-6	100.12	20.0	81.9	ND	ND		100	WG1925454
MTBE	1634-04-4	88.10	20.0	72.1	ND	ND		100	WG1925454
Naphthalene	91-20-3	128	63.0	330	ND	ND		100	WG1925454
2-Propanol	67-63-0	60.10	125	307	7800	19200		100	WG1925454
Propene	115-07-1	42.10	125	215	ND	ND		100	WG1925454
Styrene	100-42-5	104	20.0	85.1	ND	ND		100	WG1925454
1,1,2,2-Tetrachloroethane	79-34-5	168	20.0	137	ND	ND		100	WG1925454
Tetrachloroethylene	127-18-4	166	20.0	136	ND	ND		100	WG1925454
Tetrahydrofuran	109-99-9	72.10	20.0	59.0	ND	ND		100	WG1925454
Toluene	108-88-3	92.10	2500	9420	34300	129000	Q	5000	WG1927061
1,2,4-Trichlorobenzene	120-82-1	181	63.0	466	ND	ND		100	WG1925454

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

22094920-01A SVL 1

Collected date/time: 09/08/22 15:00

L1534920

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	WG1925454
1,1,2-Trichloroethane	79-00-5	133	20.0	109	ND	ND		100	WG1925454
Trichloroethylene	79-01-6	131	20.0	107	ND	ND		100	WG1925454
1,2,4-Trimethylbenzene	95-63-6	120	20.0	98.2	534	2620		100	WG1925454
1,3,5-Trimethylbenzene	108-67-8	120	20.0	98.2	853	4190		100	WG1925454
2,2,4-Trimethylpentane	540-84-1	114.22	20.0	93.4	ND	ND		100	WG1925454
Vinyl chloride	75-01-4	62.50	20.0	51.1	ND	ND		100	WG1925454
Vinyl Bromide	593-60-2	106.95	20.0	87.5	ND	ND		100	WG1925454
Vinyl acetate	108-05-4	86.10	20.0	70.4	ND	ND		100	WG1925454
m&p-Xylene	1330-20-7	106	40.0	173	13800	59800		100	WG1925454
o-Xylene	95-47-6	106	20.0	86.7	3130	13600		100	WG1925454
TPH (GC/MS) Low Fraction	8006-61-9	101	1000000	4130000	2550000	10500000	B Q	5000	WG1927061
1,1-Difluoroethane	75-37-6	66.05	100	270	817	2210		100	WG1925454
1,2,3-Trimethylbenzene	526-73-8	120.10	20.0	98.2	116	570		100	WG1925454
Chlorodifluoromethane	75-45-6	86.50	20.0	70.8	ND	ND		100	WG1925454
Ethyl acetate	141-78-6	88	20.0	72.0	ND	ND		100	WG1925454
Methyl Cyclohexane	108-87-2	98.1860	1000	4020	373000	1500000	Q	5000	WG1927061
Tert-Amyl Ethyl Ether	919-94-8	116.20	20.0	95.1	ND	ND		100	WG1925454
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		161		J1		WG1925454
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		99.6				WG1927061

Sample Narrative:

L1534920-01 WG1925454: 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	17.7	T8	1	WG1926699
Carbon Monoxide	630-08-0	28	2.00	ND	T8	1	WG1926699
Carbon Dioxide	124-38-9	44.01	0.500	2.80	T8	1	WG1926699
Methane	74-82-8	16	0.400	ND	T8	1	WG1926699

Volatile Organic Compounds (MS) by Method TO-15 [L1534920-01](#)

Method Blank (MB)

(MB) R3837020-3 09/13/22 09:59

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
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	U		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
2-Butanone (MEK)	U		0.0814	1.25

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3837020-3 09/13/22 09:59

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
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	0.144	U	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	0.342	U	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	94.3			60.0-140

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

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

(LCS) R3837020-1 09/13/22 08:40 • (LCSD) R3837020-2 09/13/22 09:20

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	3.40	3.45	90.7	92.0	70.0-130			1.46	25
Allyl Chloride	3.75	3.72	3.41	99.2	90.9	70.0-130			8.70	25
Benzyl Chloride	3.75	4.05	4.05	108	108	70.0-152			0.000	25
Bromodichloromethane	3.75	3.79	3.90	101	104	70.0-130			2.86	25
Bromoform	3.75	4.00	4.12	107	110	70.0-130			2.96	25

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

(LCS) R3837020-1 09/13/22 08:40 • (LCSD) R3837020-2 09/13/22 09:20

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Bromomethane	3.75	3.78	3.75	101	100	70.0-130			0.797	25
1,3-Butadiene	3.75	3.14	3.15	83.7	84.0	70.0-130			0.318	25
Carbon disulfide	3.75	4.03	4.11	107	110	70.0-130			1.97	25
Carbon tetrachloride	3.75	3.84	3.93	102	105	70.0-130			2.32	25
Chlorobenzene	3.75	3.85	3.97	103	106	70.0-130			3.07	25
Chloroethane	3.75	3.57	3.62	95.2	96.5	70.0-130			1.39	25
Chloroform	3.75	3.87	3.95	103	105	70.0-130			2.05	25
Chloromethane	3.75	3.33	3.40	88.8	90.7	70.0-130			2.08	25
2-Chlorotoluene	3.75	3.91	4.01	104	107	70.0-130			2.53	25
Dibromochloromethane	3.75	3.84	3.97	102	106	70.0-130			3.33	25
1,2-Dibromoethane	3.75	3.90	4.05	104	108	70.0-130			3.77	25
1,2-Dichlorobenzene	3.75	3.98	4.10	106	109	70.0-130			2.97	25
1,3-Dichlorobenzene	3.75	3.94	4.05	105	108	70.0-130			2.75	25
1,4-Dichlorobenzene	3.75	3.93	4.00	105	107	70.0-130			1.77	25
1,2-Dichloroethane	3.75	3.58	3.69	95.5	98.4	70.0-130			3.03	25
1,1-Dichloroethane	3.75	3.82	3.88	102	103	70.0-130			1.56	25
1,1-Dichloroethene	3.75	3.79	3.86	101	103	70.0-130			1.83	25
cis-1,2-Dichloroethene	3.75	3.74	3.85	99.7	103	70.0-130			2.90	25
trans-1,2-Dichloroethene	3.75	3.79	3.87	101	103	70.0-130			2.09	25
1,2-Dichloropropane	3.75	3.70	3.87	98.7	103	70.0-130			4.49	25
cis-1,3-Dichloropropene	3.75	3.95	4.05	105	108	70.0-130			2.50	25
trans-1,3-Dichloropropene	3.75	3.91	4.02	104	107	70.0-130			2.77	25
1,4-Dioxane	3.75	4.04	4.11	108	110	70.0-140			1.72	25
Ethanol	3.75	3.40	3.45	90.7	92.0	55.0-148			1.46	25
Ethylbenzene	3.75	4.00	4.04	107	108	70.0-130			0.995	25
4-Ethyltoluene	3.75	4.01	4.14	107	110	70.0-130			3.19	25
Trichlorofluoromethane	3.75	3.60	3.70	96.0	98.7	70.0-130			2.74	25
Dichlorodifluoromethane	3.75	3.82	3.86	102	103	64.0-139			1.04	25
1,1,2-Trichlorotrifluoroethane	3.75	3.98	4.03	106	107	70.0-130			1.25	25
1,2-Dichlorotetrafluoroethane	3.75	3.81	3.91	102	104	70.0-130			2.59	25
Hexachloro-1,3-butadiene	3.75	3.84	3.95	102	105	70.0-151			2.82	25
Isopropylbenzene	3.75	4.02	4.15	107	111	70.0-130			3.18	25
Methylene Chloride	3.75	3.33	3.41	88.8	90.9	70.0-130			2.37	25
Methyl Butyl Ketone	3.75	3.56	3.64	94.9	97.1	70.0-149			2.22	25
Methyl Ethyl Ketone	3.75	3.97	4.05	106	108	70.0-130			2.00	25
4-Methyl-2-pentanone (MIBK)	3.75	3.42	3.54	91.2	94.4	70.0-139			3.45	25
Methyl Methacrylate	3.75	3.94	4.07	105	109	70.0-130			3.25	25
MTBE	3.75	4.04	4.15	108	111	70.0-130			2.69	25
Naphthalene	3.75	3.70	3.71	98.7	98.9	70.0-159			0.270	25
2-Propanol	3.75	3.52	3.60	93.9	96.0	70.0-139			2.25	25

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3837020-1 09/13/22 08:40 • (LCSD) R3837020-2 09/13/22 09:20

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Propene	3.75	3.39	3.50	90.4	93.3	64.0-144			3.19	25
Styrene	3.75	4.08	4.20	109	112	70.0-130			2.90	25
1,1,2,2-Tetrachloroethane	3.75	3.89	3.96	104	106	70.0-130			1.78	25
Tetrachloroethylene	3.75	3.92	4.05	105	108	70.0-130			3.26	25
Tetrahydrofuran	3.75	3.38	3.47	90.1	92.5	70.0-137			2.63	25
1,2,4-Trichlorobenzene	3.75	3.56	3.59	94.9	95.7	70.0-160			0.839	25
1,1,1-Trichloroethane	3.75	3.85	3.91	103	104	70.0-130			1.55	25
1,1,2-Trichloroethane	3.75	3.82	3.97	102	106	70.0-130			3.85	25
Trichloroethylene	3.75	3.86	3.94	103	105	70.0-130			2.05	25
1,2,4-Trimethylbenzene	3.75	4.04	4.12	108	110	70.0-130			1.96	25
1,3,5-Trimethylbenzene	3.75	4.00	4.07	107	109	70.0-130			1.73	25
2,2,4-Trimethylpentane	3.75	3.77	3.83	101	102	70.0-130			1.58	25
Vinyl chloride	3.75	3.68	3.69	98.1	98.4	70.0-130			0.271	25
Vinyl Bromide	3.75	3.78	3.81	101	102	70.0-130			0.791	25
Vinyl acetate	3.75	3.60	3.58	96.0	95.5	70.0-130			0.557	25
m&p-Xylene	7.50	7.96	8.14	106	109	70.0-130			2.24	25
o-Xylene	3.75	4.03	4.10	107	109	70.0-130			1.72	25
1,1-Difluoroethane	3.75	3.62	3.74	96.5	99.7	70.0-130			3.26	25
1,2,3-Trimethylbenzene	3.75	4.03	4.11	107	110	70.0-130			1.97	25
Chlorodifluoromethane	3.75	3.61	3.82	96.3	102	70.0-130			5.65	25
Ethyl acetate	3.75	3.44	3.46	91.7	92.3	70.0-130			0.580	25
Tert-Amyl Ethyl Ether	3.75	3.94	4.16	105	111	70.0-130			5.43	25
(S) 1,4-Bromofluorobenzene				100	99.5	60.0-140				

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 [L1534920-01](#)

Method Blank (MB)

(MB) R3837925-3 09/15/22 13:38

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ppbv		ppbv	ppbv
Benzene	U		0.0715	0.200
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	61.6	U	39.7	200
Methyl Cyclohexane	U		0.0813	0.200
(S) 1,4-Bromofluorobenzene	96.1			60.0-140

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

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

(LCS) R3837925-1 09/15/22 12:39 • (LCSD) R3837925-2 09/15/22 13:09

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ppbv	ppbv	ppbv	%	%	%			%	%
Benzene	3.75	3.88	3.86	103	103	70.0-130			0.517	25
Cyclohexane	3.75	3.98	3.93	106	105	70.0-130			1.26	25
Heptane	3.75	4.16	4.16	111	111	70.0-130			0.000	25
n-Hexane	3.75	4.24	4.27	113	114	70.0-130			0.705	25
Toluene	3.75	4.02	4.00	107	107	70.0-130			0.499	25
TPH (GC/MS) Low Fraction	203	256	254	126	125	70.0-130			0.784	25
Methyl Cyclohexane	3.75	4.17	4.20	111	112	70.0-130			0.717	25
(S) 1,4-Bromofluorobenzene				102	101	60.0-140				

⁷ Gl

⁸ Al

⁹ Sc

Organic Compounds (GC) by Method D1946

L1534920-01

Method Blank (MB)

(MB) R3837669-3 09/15/22 13:51

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Oxygen	0.286		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) R3837669-1 09/15/22 13:45 • (LCSD) R3837669-2 09/15/22 13:48

Analyte	Spike Amount %	LCS Result %	LCSD Result %	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Oxygen	20.0	19.3	19.2	96.5	96.0	70.0-130			0.519	20
Carbon Monoxide	2.50	2.55	2.52	102	101	70.0-130			1.18	20
Carbon Dioxide	2.50	2.63	2.61	105	104	70.0-130			0.763	20
Methane	2.00	2.20	2.20	110	110	70.0-130			0.000	20

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Guide to Reading and Understanding Your Laboratory Report

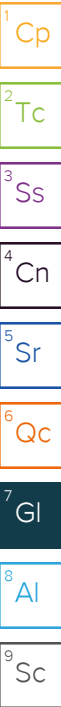
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
Q	Sample was prepared and/or analyzed past holding time as defined in the method. Concentrations should be considered minimum values.
T8	Sample(s) received past/too close to holding time expiration.



Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

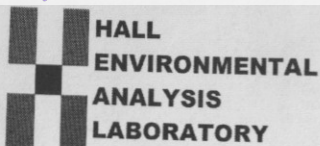
Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	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	LA000356
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.

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

M224

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

SUB CONTRACTOR: 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							
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2209433-001A	SVE-1	TEDLAR	Air	9/8/2022 3:00:00 PM	2	TO-15 . VOC. TPH. + O2 + CO2 D1946

L1534920
-01

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

PAD Screen <0.5 mR/hr: ☒ Y ☐ N

TRK 5155 8093 3271

Temp N/A

BOTTLES RECEIVED 2

SPECIAL INSTRUCTIONS / COMMENTS:

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

Relinquished By: <u>[Signature]</u>	Date: 9/9/2022	Time: 8:36 AM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: Howard Muechling	Date: 10/13	Time: 09:00

REPORT TRANSMITTAL DESIRED:

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

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

TAT:

Standard ☒

RUSH

Next BD ☐2nd BD ☐3rd BD ☐



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: 2209433

RcptNo: 1

Received By: Sean Livingston 9/9/2022 7:30:00 AM

Completed By: Tracy Casarrubias 9/9/2022 8:33:54 AM

Reviewed By: Jnala/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 $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☐ No ☒ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐ Not required
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: KPG 9-09-22

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 $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	NA	Good	Yes			

**HALL ENVIRONMENTAL
ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Chain-of-Custody Record									
Client: <u>Hilcorp</u>		Turn-Around Time: <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush							
Mailing Address:		Project Name: <u>Bell Fed GC B1</u>							
Phone #:		Project #:							
email or Fax#: <u>brandon.sinclair@hilcorp.com</u>		Project Manager: <u>Mitch Killough</u>							
QA/QC Package: <input type="checkbox"/> Standard <input type="checkbox"/> Level 4 (Full Validation)		Sampler: <u>Brandon Sinclair</u>							
Accreditation: <input type="checkbox"/> Az Compliance <input type="checkbox"/> NELAC <input type="checkbox"/> Other		On Ice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							
<input type="checkbox"/> EDD (Type)		# of Coolers: <u>1</u>							
		Cooler Temp (including CF): <u>NA</u>						(°C)	
Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.			
<u>9-8</u>	<u>1500</u>	<u>air</u>	<u>SVE-1</u>	<u>2 Tedlar</u>		<u>2209433</u>			
Date:	Time:	Relinquished by:	Received by:		Via:	Date	Time		
<u>9-8</u>	<u>1705</u>	<u>ym</u>	<u>Christina</u>		<u>Wawa</u>	<u>9/8/23</u>	<u>1725</u>		
Date:	Time:	Relinquished by:	Received by:		Via:	Date	Time		
<u>9/8/23</u>	<u>1847</u>	<u>Christina Wawala</u>	<u>Sam</u>		<u>Wawa</u>	<u>9/9/23</u>	<u>7:30</u>		

Any sub-contracted data will be clearly notated on the analytical report. This serves as notice of this possibility. Any sub-contracted data may be subcontracted to other accredited laboratories. If necessary, samples submitted to Hall Environmental may be subcontracted to Hall Environmental if necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories.

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 149875

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 149875
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See app ID 176023 for most updated status.	2/28/2023