Hilcorp Energy Company

Federal 18 #1T Remediation System
Incident No. NCS2103335776
2021 1st Quarter Report

Submitted By:
Mitch Killough
Environmental Specialist
Hilcorp Energy Company
713-757-5247

Submitted to:
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1000 Rio Brazos Road
Aztec, New Mexico 87410
505-334-6178 Ext 111

May 2021

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Introduction

The purpose of this report is to summarize the current on-site activities involving venting gas and producing water from a former coal bed methane gas well at the Federal 18 #1T. The casing of this well has been modified to vent gas and purge water from the Ojo Alamo Formation. The setup and initial installation of this system is detailed in a report submitted to Brandon Powell, New Mexico Oil Conservation Division (OCD), in November 2010. This quarterly report details operations for the quarter.

History

The vacuum system at the Federal 18 #1T is being operated as part of an on-going effort between the OCD and Hilcorp Energy Company (Hilcorp) *(project formerly under XTO Energy, Inc.)* to vent gas from the Nacimiento formation just above the Ojo Alamo Formation. Gas was found in the Nacimiento formation, which could have come from several contributing sources. The Federal 1 #18 (30-045-09466), located in Section 10 of Township 30N, Range 13W and approximately 2,600' to the south-west of water well SJ-01737, was plugged in 1988 by Southern Union Oil Company. This well only had an initial surface casing of 200' when it was drilled in 1959. Section 18 also has one (1) additional well plugged by XTO Energy, Inc. (XTO) in 2010. Section 19 of Township 30N, Range 12W has two (2) historically plugged wells. Approximately 4,400' to the south of water well SJ-01737, the Dansby #2 (30-045-09402) was plugged by Don Trader, Inc. in 1954 with a total depth of 1980' and a surface casing of only 100', and the second was a well plugged by Amoco Production in 1988. There are also three (3) additional wells plugged by Texacoma in 1997 in Section 19. There are additionally numerous oil and gas wells being operated by local exploration and production companies in the area. In Section 18, there are five (5) wells being operated by Hilcorp Energy Company (Hilcorp). In Section 19, there are nine (9) wells being operated by Hilcorp. In Section 7, there are seven (7) wells being operated by Hilcorp, and four (4) wells being operated by Robert L Bayless Producers, LLC. Furthermore, there is naturally occurring gas in the formation according to statements from local water well drillers, and a casing leak was discovered at the New Mexico Federal N #3E well site, (located in Unit D, Section 18, Township 30N, Range 12W, and San Juan County, New Mexico). This leak was identified as a result of discovery of gas in a local water well (SJ 1737) in April 2010. Bradenhead pressures were observed at several Hilcorp wells in the area. The New Mexico Federal N #3E, the New Mexico Federal N #3F and the New Mexico Federal N #3 all had bradenhead pressure tests performed. The bradenhead pressure from the New Mexico Federal N #3E was 17 psi, indicating a leak in the casing. The casing leak was repaired, and the New Mexico Federal N #3E was put back into operation. In agreement with the OCD, a nearby gas well scheduled to be plugged, Federal 18 #1T, was modified to act as a venting well by setting a plug at approximately 513 feet. Perforations were made in the casing at 437 feet and 457 feet in order to assess the groundwater and vent gas from the Nacimiento.

On September 24, 2010, a swab rig was used to determine if the well would produce water using the perforations. The swab rig recovered approximately 2 barrels of water, indicating that the perforations would produce water. A sample collected during the swab returned results above Water Quality Control Commission (WQCC) standards for benzene, total xylenes, and total chlorides; see attached ***Federal 18 #1T Water Results Table***. Due to the low pH and high chlorides, it was inferred that the acid used to dissolve cement during perforation activities may

have infiltrated the aquifer, causing the increased levels shown in the sampling results. XTO recommended pumping the aquifer until sampling results were below the WQCC standards for BTEX and chlorides.

A pump was installed in the Federal 18 #1T on November 9, 2010 at approximately 485 feet. During the pump installation, the water level was checked using a Keck ET Long water level indicator. The static water level was found to be approximately 402.20 feet. The pump was initially set to operate four (4) times a day for 15 minutes, purging approximately 260 gallons per day. During swab and pump installation activities, no gas was found flowing from the well.

On November 11, 2010, a small vacuum pump was installed at the Federal 18 #1T to determine if gas could be vented. The discharge from the vacuum was checked using a MSA 4-Gas Monitor, which confirmed that methane, was being vented from the vacuum pump discharge. The vacuum pump operates at a discharge rate of three (3) standard cubic feet per minute (scfm), which is equivalent to approximately six (6) actual cubic feet per minute (acfm) based on elevation. This volume was calculated using the conversion factors provided by the vacuum pump manufacturer, Becker. The vacuum pump initially held a vacuum of approximately -12 inches of mercury on the casing of the Federal 18 #1T during operation. A portable generator placed on-site powered both the vacuum pump and the water pump.

The water pump was plumbed into the existing water lines on site, so that all water would pump into the 210-barrel water tank left on-site from production activities. Water piping above ground was wrapped with heat trace and insulation to prevent freezing.

The system was electrified on February 3, 2011 to prevent down time due to generator maintenance issues.

The Federal 18-1T system is visually checked typically on a weekly basis, but no more than every other week depending on weather-related delays. The site check includes verifying pump operation, vacuum operation, recording volume changes based on prior visit, and verifying that no other site conditions need adjustment. The SJ 1737 well is evaluated on a weekly basis to open the valve for a week and then close the valve the following week. Before the valve is opened the next week, a record of the pressure is taken before opening the valve.

1Q2021 Activities

As discussed in Hilcorp's previous quarterly report submittal (dated January 2021), operations had observed during a site visit on July 8, 2020 that the vacuum pump at the Federal 18 1T had malfunctioned. Since this pump had been replaced fairly recently on September 16, 2019, it is believed that the pump had been oversized for the intended application, which caused the pump to burn up. As a solution, Hilcorp purchased a Becker BT 4.8 (single phase, 0.59-HP) vacuum pump as a replacement on January 31, 2021. However, upon arrival on February 15, 2021, the pump was determined to be defective. Upon receiving a replacement, Hilcorp was able to successfully start-up the pump on March 23, 2021. The pump ran for the remainder of March 2021.

Hilcorp operations collected a water sample from the Federal 18 1T on February 17, 2021. A total of 1,131,123 gallons of water have been removed from the Federal 18 1T as of the collection date of this first quarter Federal 18 1T water sample. The attached ***Federal 18 #1T Water Results Table*** shows that the benzene concentrations have increased since last quarter and results remain above the WQCC standard at 73 ppb. Chloride concentrations have increased slightly from 13.9 ppm to 18 ppm, but remain below WQCC standards. pH values decreased slightly from last quarter to 7.42. TDS continues to remain above WQCC standards at 2200 ppm, but concentrations have decreased when compared to the previous quarter. It should be noted that TDS baseline levels (1,400 ppm) in water well SJ 1737 were historically above WQCC standards.

The pressure at well SJ 1737 was checked over the course of the quarter. The pressure was checked by shutting in the casing for a minimum of one (1) week prior to reading the pressure gauge. The pressure readings are outlined in the attached ***Well SJ 1737 Casing Pressures Table***. The pressure remained fairly constant over the course of the quarter.

Recommendations

Groundwater samples will continue to be collected quarterly to monitor the benzene concentration in this well. Hilcorp proposes the continued operation of the vacuum pump and water pump at the Federal 18 #1T. Groundwater samples will continue to be collected on a quarterly basis until benzene levels remain below the WQCC standards for four (4) consecutive quarters. An alternative sampling schedule may be recommended at that time.

Mitch Killough
Environmental Specialist
Hilcorp Energy Company

Federal 18 #1T Gas Vented			
Date	SCFM	ACFM	Gas Vented Total (MCF)
7/1/2019	3	6	26374.8
7/8/2019	3	6	26435.2
8/2/2019	3	6	26676.8
8/20/2019	Vacuum Pump not running		
8/29/2019	Vacuum Pump not running		
9/10/2019	Vacuum Pump removed		
9/17/2019	4		26676.8
10/7/2019	4		26848.8
10/21/2019	4		26969.2
10/28/2019	4		27029.6
12/5/2019	4		27356.4
12/19/2019	4		27477.2
1/7/2020	4	6	27954.1
1/17/2020	4	6	28040.4
1/30/2020	4	6	28152.6
2/12/2020	4	6	28264.8
2/25/2020	4	6	28377.0
4/3/2020	4	6	28704.6
4/9/2020	4	6	28756.3
4/15/2020	4	6	28808.0
4/23/2020	4	6	28877.0
4/30/2020	4	6	28937.4
5/15/2020	4	6	29066.7
5/21/2020	4	6	29118.4
5/29/2020	4	6	29178.8
6/5/2020	4	6	29239.2
6/29/2020	0	0	Hot not running
7/8/2020	0	0	Unit Down
8/11/2020	0	0	Unit Down
8/25/2020	0	0	Unit Down
9/16/2020	0	0	Unit Down
9/22/2020	0	0	Unit Down
10/26/2020	0	0	Unit Down
11/9/2020	0	0	Unit Down
12/8/2020	0	0	Unit Down
1/5/2021	0	0	Unit Down
1/20/2021	0	0	Unit Down
2/11/2021	0	0	Unit Down
2/17/2021	0	0	Unit Down
3/25/2021	0	0	Unit Down on timer
*3/31/2021	0	0	29240.7

* - Pump operated from 3/23 - 3/31/2021. Vacuum pumps off 168 scf per day based on manufacture specifications.

Well SJ 1737 Casing Pressure Readings

Date	Casing Pressure (oz)	Average
7/1/2019	0.5	0.100
7/8/2019	0	0.000
8/2/2019	0	0.000
8/20/2019	0	0.000
8/29/2019	0.5	0.056
9/10/2019	0	0.000
9/17/2019	1	0.143
10/7/2019	0	0.000
10/21/2019	1.75	0.125
10/28/2019	0	0.000
12/5/2019	0	0.000
12/19/2019	3	0.214
1/7/2020	0	0.000
1/17/2020	1.25	0.125
1/30/2020	0	0.000
2/12/2020	2.25	0.173
2/25/2020	0	0.000
4/3/2020	1.75	0.046
4/9/2020	0	0.000
4/15/2020	3	0.500
4/23/2020	0	0.000
4/30/2020	0.5	0.071
5/15/2020	0	0.000
5/21/2020	1.25	0.208
5/29/2020	0	0.000
6/5/2020	0.5	0.071
6/29/2020	0	0.000
7/8/2020	0.75	0.083
7/22/2020	0	0.000
8/11/2020	0	0.000
8/25/2020	0	0.000
9/16/2020	0	0.000
9/22/2020	0	0.000
10/26/2020	2.75	0.081
11/9/2020	0	0.000
12/8/2020	0	0.000
12/18/2020	0	0.000
1/5/2021	1.75	0.097
1/20/2021	0	0.000
2/11/2021	1.75	0.080
2/17/2021	0	0.000
3/25/2021	3.5	0.097

Federal 18 #1T Water Results

Date	Lab	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylene (ppb)	Chlorides (ppm)	TDS (ppm)	EC (umhos/cm)	pH	Purge Water Volume
NA	NA	10	750	750	620	250	1000	NA	6 thru 9	NA
9/24/2010	ESC	**150**	BDL	76	**670**	NS	NS	NS	NS	NA
9/24/2010	ESC	**190**	170	24	210	**6800**	**13000**	18000	6.1	NA
9/24/2010	Etech	**143**	221	63.6	**950**	NS	NS	NS	NS	NA
9/24/2010	Etech	**320**	377	31.8	568	**7150**	**11100**	16000	**5.84**	NA
12/10/2011	Hall	NS	NS	NS	NS	**2800**	**7610**	8900	6.36	3032.5
1/5/2011	Hall	**67**	93	7.9	25	NS	NS	NS	NS	7,798
1/5/2011	ESC	**73**	99	10	39	**1600**	**4800**	6000	6.6	7,798
1/29/2011	ESC	**60**	93	10	33	**930**	NS	4900	6.4	10791.0
2/28/2011	ESC	**42**	60	6.1	20	**550**	**3400**	4000	6.7	14795.0
4/1/2011	ESC	**23**	27	1.8	6.8	**260**	**2700**	3100	6.8	31237.5
4/29/2011	ESC	**29**	28	2.4	7.3	140	**2600**	2900	6.9	50217.0
5/31/2011	ESC	**14**	19	1.4	4.9	89	**2500**	2800	6.7	76513.0
6/14/2011	ESC	**55**	81	2.8	15	73	**2500**	2700	6.7	88120.0
6/30/2011	ESC	**52**	67	2.6	12	61	**2500**	2700	6.9	101208.5
8/15/2011	ESC	**21**	25	1.2	5.8	44	**2500**	2600	6.8	140267.0
9/2/2011	ESC	**10**	12	0.64	3.2	41	**2500**	2600	7.2	155801.0
9/16/2011	ESC	9.6	11	0.64	3	38	**2400**	2500	7.2	168040.0
9/30/2011	ESC	7.2	8.7	0.64	2.5	35	**2500**	2600	7	180392.5
10/28/2011	ESC	5.1	BDL	1.8	2.7	31	**2300**	2600	6.9	205,220
11/30/2011	ESC	4	BDL	3.9	2	27	**2500**	2600	7.1	233,487.5
12/30/2011	ESC	3.4	BDL	BDL	2.9	27	**2500**	2500	7.5	261,390.5
4/3/2012	ESC	6	BDL	BDL	1.6	NS	NS	NS	NS	351,300
4/9/2012	ESC	NS	NS	NS	NS	19	**2400**	2400	7.4	NA
7/3/2012	ESC	5.3	BDL	BDL	BDL	16	**2300**	2400	7.4	NA
7/6/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	441,053
9/19/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	521,271
9/27/2012	ESC	6.2	BDL	BDL	BDL	15	**2300**	2500	7.1	NA
12/14/2012	NA	NS	NS	NS	NS	NS	NS	NS	NS	598,540
12/31/2012	Etech	**13.9**	1.1	ND	3.3	15.5	**2690**	2440	7.05	604,689
1/23/2013	ESC	**160**	190	BDL	26	15	**2400**	2500	8	PUMP SHUT OFF
2/22/2013	ESC	7.1	77	BDL	1.8	15	**2100**	2500	7.1	605,860
5/2/2013	ESC	9	6.9	BDL	BDL	15	**2400**	2600	7.5	612,601
8/19/2013	ESC	**20**	11	BDL	2.3	16	**2200**	2600	7.2	NA
9/23/2013	ESC	**13**	11	BDL	2.2	16	**2300**	2500	7.1	621,744
11/25/2013	ESC	4.6	5.2	BDL	BDL	15	**2200**	2700	7.7	631,430
2/4/2014	ESC	15	17	0.72	3.1	16	**2200**	2500	7.3	636,120
10/1/2015	ESC	**54.2**	57	1.37	9.77	21.3	**2260**	2640	6.98	639,410
10/20/2015	ESC	**42.3**	39.9	0.964	7.06	18.1	**2330**	1460	7.09	642,650
3/28/2016	ESC	**38**	34.1	0.835	4.82	21.6	**2230**	2570	6.86	650,850
6/14/2016	ESC	**78.3**	58.4	1.16	7.22	13.7	**2890**	2600	6.89	704,371
8/29/2016	ESC	**19**	BDL	BDL	2.18	14.8	**2410**	2590	7.02	763,261
11/18/2016	ESC	**13.2**	5.61	BDL	2.33	13.9	**2470**	2580	7.03	842,610
3/31/2017	ESC	9.61	7.87	BDL	BDL	14.4	**2300**	2570	7.28	858,190
6/16/2017	ESC	**64.6**	29.2	0.781	5.4	14.2	**2360**	2570	7.05	927,854
9/7/2017	ESC	4.61	1.73	BDL	BDL	13.7	**2030**	2450	7.14	997,330
12/5/2017	ESC	138	51.5	1.65	9.378	14.4	**2230**	2590	7.2	1,080,550
3/6/2018	ESC	19.9	14.8	0.543	2.71	14.4	**2290**	2620	7.13	1,080,840
8/7/2018	Pace	7.9	8.06	<0.5	<1.5	13.7	**2200**	2300	7.19	1,082,751
1/3/2019	Pace	7.07	3.29	0.177	1.08	15.8	**2080**	6750	6.35	1,120,220
2/22/2019	Pace	19.8	11.1	<0.5	3.97	14.1	**2270**	2710	7.46	1,120,366
5/24/2019	Pace	11.9	10.8	ND	ND	13.4	**2380**	2760	7.15	1,123,853
9/10/2019	Pace	23.2	18.8	ND	ND	14.3	**2260**	2600	7.37	1,125,478
10/29/2019	Pace	5.41	5.68	ND	ND	14	**2300**	2530	7.09	1,127,076
2/27/2020	Pace	20.7	19.3	ND	ND	14.4	**2280**	2580	7.06	1,128,506
5/15/2020	Pace	10.3	8.91	ND	ND	13.6	**2460**	2570	7.27	1,131,033
8/25/2020	Pace	3.9	3.5	ND	ND	13.9	**2190**	2640	7.62	1,131,100
10/27/2020	Pace	31.1	24.4	ND	ND	13.9	**2240**	2530	7.43	1,131,119
2/17/2021	Hall	73	<1	<1	<1.5	18	**2200**	2400	7.42	1,131,123
11/5/2010	ESC	ND	5.2	ND	ND	15	**1400**	2600	7.2	NA

BDL = Below Detection Limits
NS = Not Sampled
Values in **BOLD** exceed WQCC Standards
Baseline Sample (Well SJ 1737)
WQCC Standards

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

February 25, 2021

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

RE: Federal 18 1T OrderNo.: 2102863

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 1 sample(s) on 2/19/2021 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2102863**
Date Reported: **2/25/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Tubing
Project: Federal 18 1T
Collection Date: 2/17/2021 9:20:00 AM
Lab ID: 2102863-001 **Matrix:** AQUEOUS **Received Date:** 2/19/2021 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	18	2.5		mg/L	5	2/19/2021 2:50:31 PM	R75435
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MH**	
Conductivity	2400	10		µmhos/c	1	2/22/2021 12:24:42 PM	R75456
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **MH**	
Total Dissolved Solids	2200	40.0	*D	mg/L	1	2/24/2021 8:40:00 AM	58254
SM4500-H+B / 9040C: PH						Analyst: **MH**	
pH	7.42		H	pH units	1	2/22/2021 12:24:42 PM	R75456
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Benzene	73	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Toluene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Ethylbenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Naphthalene	ND	2.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1-Methylnaphthalene	ND	4.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
2-Methylnaphthalene	ND	4.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Acetone	ND	10		µg/L	1	2/20/2021 3:31:41 AM	R75438
Bromobenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Bromodichloromethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Bromoform	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Bromomethane	ND	3.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
2-Butanone	ND	10		µg/L	1	2/20/2021 3:31:41 AM	R75438
Carbon disulfide	ND	10		µg/L	1	2/20/2021 3:31:41 AM	R75438
Carbon Tetrachloride	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Chlorobenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Chloroethane	ND	2.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Chloroform	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Chloromethane	ND	3.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
2-Chlorotoluene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
4-Chlorotoluene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
cis-1,2-DCE	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Dibromochloromethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix

Analytical Report
Lab Order **2102863**
Date Reported: **2/25/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Tubing
Project: Federal 18 1T
Collection Date: 2/17/2021 9:20:00 AM
Lab ID: 2102863-001 **Matrix:** AQUEOUS **Received Date:** 2/19/2021 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Dibromomethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2-Dichlorobenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,3-Dichlorobenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,4-Dichlorobenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Dichlorodifluoromethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,1-Dichloroethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,1-Dichloroethene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2-Dichloropropane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,3-Dichloropropane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
2,2-Dichloropropane	ND	2.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,1-Dichloropropene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Hexachlorobutadiene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
2-Hexanone	ND	10		µg/L	1	2/20/2021 3:31:41 AM	R75438
Isopropylbenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
4-Isopropyltoluene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
4-Methyl-2-pentanone	ND	10		µg/L	1	2/20/2021 3:31:41 AM	R75438
Methylene Chloride	ND	3.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
n-Butylbenzene	ND	3.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
n-Propylbenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
sec-Butylbenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Styrene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
tert-Butylbenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
trans-1,2-DCE	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,1,1-Trichloroethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,1,2-Trichloroethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Trichloroethene (TCE)	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Trichlorofluoromethane	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
1,2,3-Trichloropropane	ND	2.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Vinyl chloride	ND	1.0		µg/L	1	2/20/2021 3:31:41 AM	R75438
Xylenes, Total	ND	1.5		µg/L	1	2/20/2021 3:31:41 AM	R75438
Surr: 1,2-Dichloroethane-d4	93.1	70-130		%Rec	1	2/20/2021 3:31:41 AM	R75438
Surr: 4-Bromofluorobenzene	99.7	70-130		%Rec	1	2/20/2021 3:31:41 AM	R75438
Surr: Dibromofluoromethane	93.5	70-130		%Rec	1	2/20/2021 3:31:41 AM	R75438

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix

Analytical Report
Lab Order **2102863**
Date Reported: **2/25/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Tubing
Project: Federal 18 1T
Collection Date: 2/17/2021 9:20:00 AM
Lab ID: 2102863-001 **Matrix:** AQUEOUS **Received Date:** 2/19/2021 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Surr: Toluene-d8	106	70-130		%Rec	1	2/20/2021 3:31:41 AM	R75438

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2102863**

25-Feb-21

Client: HILCORP ENERGY

Project: Federal 18 1T

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R75435**	RunNo: **75435**
Prep Date:	Analysis Date: **2/19/2021**	SeqNo: **2665671** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R75435**	RunNo: **75435**
Prep Date:	Analysis Date: **2/19/2021**	SeqNo: **2665672** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	98.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2102863**
25-Feb-21

Client: HILCORP ENERGY
Project: Federal 18 1T

Sample ID: **100ng lcs** SampType: **LCS** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW** Batch ID: **R75438** RunNo: **75438**
Prep Date: Analysis Date: **2/19/2021** SeqNo: **2665774** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	89.6	70	130			
Toluene	19	1.0	20.00	0	96.5	70	130			
Chlorobenzene	20	1.0	20.00	0	102	70	130			
1,1-Dichloroethene	16	1.0	20.00	0	80.8	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	79.4	70	130			
Surr: 1,2-Dichloroethane-d4	9.0		10.00		90.2	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		95.6	70	130			
Surr: Dibromofluoromethane	9.0		10.00		90.3	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID: **mb1** SampType: **MBLK** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW** Batch ID: **R75438** RunNo: **75438**
Prep Date: Analysis Date: **2/19/2021** SeqNo: **2665775** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2102863**
25-Feb-21

Client: HILCORP ENERGY
Project: Federal 18 1T

Sample ID: **mb1** SampType: **MBLK** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW** Batch ID: **R75438** RunNo: **75438**
Prep Date: Analysis Date: **2/19/2021** SeqNo: **2665775** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2102863**
25-Feb-21

Client: HILCORP ENERGY
Project: Federal 18 1T

Sample ID: **mb1** SampType: **MBLK** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW** Batch ID: **R75438** RunNo: **75438**
Prep Date: Analysis Date: **2/19/2021** SeqNo: **2665775** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.3		10.00		82.7	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.6	70	130			
Surr: Dibromofluoromethane	9.9		10.00		99.5	70	130			
Surr: Toluene-d8	11		10.00		111	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2102863**
25-Feb-21

Client: HILCORP ENERGY
Project: Federal 18 1T

Sample ID: **lcs-1 99.5uS eC** SampType: **lcs** TestCode: **SM2510B: Specific Conductance**
Client ID: **LCSW** Batch ID: **R75456** RunNo: **75456**
Prep Date: Analysis Date: **2/22/2021** SeqNo: **2666812** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	10	99.50	0	101	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2102863**

25-Feb-21

Client: HILCORP ENERGY

Project: Federal 18 1T

Sample ID: **MB-58254**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **58254**	RunNo: **75493**
Prep Date: **2/22/2021**	Analysis Date: **2/24/2021**	SeqNo: **2668079** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-58254**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **58254**	RunNo: **75493**
Prep Date: **2/22/2021**	Analysis Date: **2/24/2021**	SeqNo: **2668080** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1010	20.0	1000	0	101	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: HILCORP ENERGY Work Order Number: 2102863 RcptNo: 1

Received By: Sean Livingston 2/19/2021 8:30:00 AM Sean Livingston

Completed By: Sean Livingston 2/19/2021 9:28:18 AM Sean Livingston

Reviewed By: DAD 2/19/21

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: SPA 2.19.21

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	2.0	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp

Mailing Address:

Phone #: 505-324-5128

email or Fax#: 505-486-9543

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: FEDERAL 18 #1T

Project #:

Project Manager: JENNIFER DEAL

Sampler: KURT

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 2.0 +0=2.0 (°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. 2102863	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)	pH, Chloride	SPCOND, TDS	NOT FIELD FILTERED			
2-17	9:20	GW	TUBING	3 VOC 2 250ML	HCl	001								X			X	X	X			

Remarks:

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
2/18/21	1623	Kurt Hostetler	Christ Wall		2/18/21	1623
2/18/21	1811	Christine Waeters	SGL counter		2/19/21	8:30

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

Action 28332

CONDITIONS

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 28332
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See App ID 132101 for most updated status.	9/8/2022