

Hilcorp Energy Company

Federal 18 #1T Remediation System RP# (3RP-1034) 2019 2nd Quarter Report

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Attachments

Water Analysis Lab Report

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 (formerly 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.

Currently the Federal 18-1T system visually checked on a weekly basis. The site check includes verifying pump operation, vacuum operation, recording volume changes based on week prior, and verifying that no other site conditions need adjustment. The 1737 well is evaluated on a weekly basis to open the valve for a week and then closing the valve the following week, before the valve is opened the next week a record of the pressure is taken before opening the valve.

2nd Quarter Activities

Hilcorp Operations sampled on May 24, 2019. A total of 1,123,853 gallons of water has been removed from the Federal 18 1T as of June 26, 2019. The attached *Federal 18 #1T Water Results Table* shows that the benzene concentrations have decreased since last month but results are still the WQCC standard at 11.9 ppb. Chloride levels have decreased from last month with a result of 13.4 ppm. pH values decreased from last month to 7.15. TDS continues to be above WQCC standards at 2380 ppm, but background levels (1,400 ppm) in water well SJ 1737 are historically above WQCC standards as well.

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. An overall decreasing trend has existed in the water well casing since 2011.

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.

Jennifer Deal Environmental Specialist Hilcorp Energy Company

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10/1/2015 ESC 54.2 57 1.37 9.77 21.3 2260 2640 6.98 6.39,41 10/20/2015 ESC 42.3 33.3 0.364 7.06 18.1 2330 1460 7.03 6642,65 3/28/2016 ESC 38 34.1 0.835 4.82 21.6 2230 2570 6.86 650,85 6/14/2016 ESC 78.3 58.4 1.16 7.22 13.7 2830 2600 6.83 704,37 8/29/2016 ESC 13 BDL BDL 2.16 14.8 2410 2580 7.02 763,24 11/18/2016 ESC 13.2 5.61 BDL 2.33 13.3 2470 2580 7.03 842,61 3/31/2017 ESC 64.6 29.2 0.761 5.4 14.2 2360 2570 7.05 327,85 3/11/2017 ESC 64.61 1.73 BDL BDL 13.7	11/25/2013	ESC		5.2	BDL	BDL			2700	7.7	631,430
0/20/2015 ESC 42.3 33.9.3 0.964 7.06 18.1 2330 1460 7.09 642,65 3/28/2016 ESC 38 34.1 0.835 4.62 216 2230 2570 6.66 650,85 6/14/2016 ESC 78.3 58.4 1.16 7.22 13.7 2830 2600 6.69 704,31 8/29/2016 ESC 13.2 5.61 BDL 2.18 14.8 2410 2590 7.02 763,26 11/16/2016 ESC 13.2 5.61 BDL 2.33 13.3 2470 2580 7.03 842,61 3/31/2017 ESC 9.61 7.87 BDL BDL 14.4 2300 2570 7.05 927,85 3/1/2017 ESC 64.6 29.2 0.781 5.4 14.2 2360 2570 7.2 1,080,55 3/1/2017 ESC 4.61 1.73 BDL BDL 13.7 2	2/4/2014	ESC				3.1	16	2200	2500	7.3	636,120
3/28/2016 ESC 38 34.1 0.835 4.82 216 2230 2570 6.86 650,85 6/14/2016 ESC 78.3 58.4 1.16 7.22 13.7 2830 2600 6.83 704,33 8/23/2016 ESC 13 BDL BDL 2.18 14.8 2410 2530 7.02 763,26 11/18/2016 ESC 13.2 5.61 BDL 2.33 13.3 2470 2580 7.03 842,61 3/31/2017 ESC 3.61 7.87 BDL BDL 14.4 2300 2570 7.28 858,19 6/16/2017 ESC 64.6 23.2 0.781 5.4 14.2 2360 2570 7.05 327,85 3/17/2017 ESC 4.61 1.73 BDL BDL 13.7 2030 2450 7.14 939,33 12/5/2017 ESC 13.3 51.5 1.65 3.376 14.4 2230 2620 7.13 1,080,84 8/7/2018 ESC 7.3	10/1/2015	ESC	54.2	57	1.37	9.77	21.3	2260	2640	6.98	639,410
6/14/2016 ESC 78.3 58.4 1.16 7.22 13.7 2830 2600 6.83 T04.33 8/29/2016 ESC 19 BDL BDL 2.18 14.8 2410 2530 7.02 763.26 11/18/2016 ESC 13.2 5.61 BDL 2.33 13.3 2470 2580 7.03 842,61 3/31/2017 ESC 3.61 7.87 BDL BDL 14.4 2300 2570 7.28 858,19 6/16/2017 ESC 64.6 29.2 0.781 5.4 14.2 2360 2570 7.05 327,85 3/7/2017 ESC 4.61 1.73 BDL BDL 13.7 2030 2450 7.14 397,33 12/5/2017 ESC 138 51.5 1.65 9.378 14.4 2230 2620 7.13 1,080,84 8/7/2018 ESC 7.3 8.06 <0.5	10/20/2015	ESC	42.3	39.9	0.964	7.06	18.1	2330	1460	7.09	642,650
8/23/2016 ESC 19 BDL BDL 2.18 14.8 2410 2590 7.02 763,24 11/16/2016 ESC 13.2 5.61 BDL 2.33 13.3 2470 2580 7.03 842,61 3/31/2017 ESC 3.61 7.87 BDL BDL 14.4 2300 2570 7.28 858,19 6/16/2017 ESC 64.6 29.2 0.781 5.4 14.2 2360 2570 7.05 927,85 9/7/2017 ESC 4.61 1.73 BDL BDL 13.7 2030 2450 7.14 937,33 12/5/2017 ESC 13.8 51.5 1.65 9.378 14.4 2230 2590 7.2 1,080,55 3/6/2018 ESC 7.3 8.06 <0.5	3/28/2016	ESC	38	34.1	0.835	4.82	21.6	2230	2570	6.86	650,850
11/18/2016 ESC 13.2 5.61 BDL 2.33 13.9 2470 2580 7.03 842,61 3/31/2017 ESC 9.61 7.87 BDL BDL 14.4 2300 2570 7.28 858,19 6/16/2017 ESC 64.6 29.2 0.761 5.4 14.2 2360 2570 7.05 927,65 9/7/2017 ESC 4.61 1.73 BDL BDL 13.7 2030 2450 7.14 997,33 12/5/2017 ESC 138 51.5 1.65 9.378 14.4 2230 2590 7.2 1,080,55 3/6/2018 ESC 7.3 8.06 <0.5	6/14/2016	ESC	78.3	58.4	1.16	7.22	13.7	2890	2600	6.89	704,37
3/31/2017 ESC 9.61 7.87 BDL BDL 14.4 2300 2570 7.28 858,19 6/16/2017 ESC 64.6 29.2 0.761 5.4 14.2 2360 2570 7.05 927,65 9/7/2017 ESC 4.61 1.73 BDL BDL 13.7 2030 2450 7.14 997,33 12/5/2017 ESC 138 51.5 1.65 9.378 14.4 2230 2590 7.2 1,080,55 3/6/2018 ESC 13.3 14.8 0.543 2.71 14.4 2230 2620 7.13 1,080,64 8/7/2018 ESC 7.3 8.06 <0.5	8/29/2016	ESC	19	BDL	BDL	2.18	14.8	2410	2590	7.02	763,261
6/16/2017 ESC 64.6 29.2 0.781 5.4 14.2 2360 2570 7.05 3927,85 3/7/2017 ESC 4.61 1.73 BDL BDL 13.7 2030 2450 7.14 3937,33 12/5/2017 ESC 138 51.5 1.65 9.378 14.4 2230 2590 7.2 1,080,55 3/6/2018 ESC 13.3 14.8 0.543 2.71 14.4 2230 2620 7.13 1,080,64 8/7/2018 ESC 7.3 8.06 <0.5	11/18/2016	ESC	13.2	5.61	BDL	2.33	13.9	2470	2580	7.03	842,610
3/7/2017 ESC 4.61 1.73 BDL BDL 13.7 2030 2450 7.14 3937,33 12/5/2017 ESC 138 51.5 1.65 9.376 14.4 2230 2530 7.2 1,080,55 3/6/2018 ESC 13.3 14.8 0.543 2.71 14.4 2230 2620 7.13 1,080,64 8/7/2018 ESC 7.3 8.06 <0.5	3/31/2017	ESC	9.61	7.87	BDL	BDL	14.4	2300	2570	7.28	858,190
12/5/2017 ESC 138 51.5 1.65 9.378 14.4 2230 2590 7.2 1,080,55 3/6/2018 ESC 13.9 14.8 0.543 2.71 14.4 2290 2620 7.13 1,080,84 8/7/2018 ESC 7.3 8.06 <0.5	6/16/2017	ESC	64.6	29.2	0.781	5.4	14.2	2360	2570	7.05	927,854
12/5/2017 ESC 138 51.5 1.65 9.378 14.4 2230 2590 7.2 1,080,55 3/6/2018 ESC 19.9 14.8 0.543 2.71 14.4 2290 2620 7.13 1,080,64 8/7/2018 ESC 7.9 8.06 <0.5	9/7/2017	ESC	4.61	1.73	BDL	BDL	13.7	2030	2450	7.14	997,330
3/6/2018 ESC 13.9 14.8 0.543 2.71 14.4 2290 2620 7.13 1,080,84 8/7/2018 ESC 7.3 8.06 <0.5		ESC	138	51.5	1.65	9.378	14.4	2230	2590		1,080,550
8/7/2018 ESC 7.9 8.06 <0.5 <1.5 13.7 2200 2300 7.19 1,082,71 1/3/2019 ESC 7.07 3.29 0.177 1.08 15.8 2080 6750 6.35 1,120,22 2/22/2019 ECS 13.8 11.1 <0.5		<u> </u>					l				1,080,840
1/3/2019 ESC 7.07 3.29 0.177 1.08 15.8 2080 6750 6.35 1,120,22 2/22/2019 ECS 13.8 11.1 <0.5		<u> </u>									1,082,75
2/22/2019 ECS 13.8 11.1 <0.5 3.97 14.1 2270 2710 7.46 1,120,36 5/24/2019 ECS 11.9 10.8 ND ND 13.4 2380 2760 7.15 1,120,36 11/5/2010 ESC ND 5.2 ND ND 15 1400 2600 7.2 N IDL = Below Detection Limits IS = Not Sampled IS = Not Sampled IS IS = Not Sample (Well SJ 1737) IS = Not Sample (Well SJ 1737) <td< td=""><td></td><td><u> </u></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1,120,220</td></td<>		<u> </u>									1,120,220
5/24/2019 ECS 11.3 10.8 ND ND 13.4 2380 2760 7.15 1,123,85 11/5/2010 ESC ND 5.2 ND ND 15 1400 2600 7.2 N iDL = Below Detection Limits IS = Not Sampled IS = Not Sampled IS = Not Sample (Well SJ 1737)		<u> </u>									
11/5/2010 ESC ND 5.2 ND ND 15 1400 2600 7.2 N IDL = Below Detection Limits IDL = Below Detectetion											1,123,853
IS = Not Sampled Salues in BOLD exceed WQCC Standards Salues in BOLD exceed WQCC Standards Salues in Salues Sample (Well SJ 1737)											NA
IS = Not Sampled Salues in BOLD exceed WQCC Standards Salues in BOLD exceed WQCC Standards Salues in Salues Sample (Well SJ 1737)	BDL = Below	y Detecti	on Limita								
Values in BOLD exceed WQCC Standards Baseline Sample (Well SJ 1737)											
Baseline Sample (Well SJ 1737)			eed WQCC Star	ndards							
VQCC Standards											
		VQCC	Standards								

Federal 18 #1T Water Results

	Federa	al 18 #1	T Gas Vented
Date	SCFM	ACFM	Gas Vented Total (MCF)
2/19/2018	3	6	22569.6
2/26/2018	3	6	22630.0
3/5/2018	3	6	22690.4
4/26/2018	3	6	22750.8
5/8/2018	3	6	22811.2
5/16/2018	3	6	22871.6
5/22/2018	3	6	22932.0
6/5/2018	3	6	22992.4
6/20/2018	3	6	23052.8
7/2/2018	3	6	23113.2
7/13/2018	3	6	23173.6
7/19/2018	3	6	23234.0
7/25/2018	3	6	23294.4
8/1/2018	3	6	23354.8
8/9/2018	3	6	23415.2
8/22/2018	3	6	23536.0
8/30/2018	3	6	23596.4
9/7/2018	3	6	23656.8
9/14/2018	3	6	23717.2
9/20/2018	3	6	23777.6
	-	-	23838.0
9/28/2018	3	6	23058.8
10/15/2018	3	6	
10/23/2018	3	6	24019.2
11/2/2018	3	6	24140.0
11/9/2018	3	6	24200.4
11/15/2018	3	6	24260.8
11/29/2018	3	6	24381.6
12/6/2018	3	6	24442.0
1/3/2019	3	6	24683.6
1/17/2019	3	6	24804.4
2/8/2019	3	6	24985.6
2/13/2019	3	6	25046.0
2/20/2019	3	6	25106.4
2/27/2019	3	6	25166.8
3/4/2019	3	6	25227.2
4/1/2019	3	6	25468.8
4/11/2019	3	6	25589.6
4/17/2019	3	6	25650.0
4/25/2019	3	6	25710.4
5/9/2019	3	6	25831.2
5/20/2019	3	6	25952.0
6/10/2019	3	6	26133.2
6/26/2019	3	6	26314.4

Date	Casing Pressure (oz)	Average
6/5/2018	0	0.000
6/20/2018	0.5	0.033
7/2/2018	0	0.000
7/13/2018	0.25	0.023
7/19/2018	0	0.000
7/25/2018	0	0.000
8/1/2018	0.5	0.071
8/9/2018	bad gauge	
8/22/2018	bad gauge	
8/30/2018	6.0?	
9/7/2018	0	0.000
9/14/2018	0	0.000
9/20/2018	0	0.000
9/28/2018	0.75	0.094
10/15/2018	0.25	0.015
10/23/2018	0	0.000
11/2/2018	1	0.100
11/9/2018	0	0.000
11/15/2018	0	0.000
11/29/2018	0	0.000
12/6/2018	1.25	0.179
1/3/2019	0	0.000
1/17/2019	1	0.071
2/8/2019	0	0.000
2/13/2019	1.5	0.300
2/20/2019	0	0.000
2/27/2019	0.75	0.107
3/4/2019	0	0.000
4/1/2019	1	0.036
4/11/2017	0	0.000
4/17/2019	2.25	0.003
5/9/2019	2	0.091
5/20/2019	0	0.000
6/10/2019	0	0.000
6/26/2019	0	0.000

Well SJ 1737 Casing Pressures



ANALYTICAL REPORT

HilCorp-Farmington, NM

Sample Delivery Group:	L1102729
Samples Received:	05/25/2019
Project Number:	FEDERAL 18 #IT
Description:	FEDERAL 18 #IT
Site:	FEDERAL 18 #IT
Report To:	Jennifer Deal
	382 Road 3100
	Aztec, NM 87401

Entire Report Reviewed By: Naplme & Richards

Daphne Richards 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 National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

ACCOUNT: HilCorp-Farmington, NM PROJECT: FEDERAL 18 #IT SDG: L1102729 DATE/TIME: 06/05/19 12:59 PAGE: 1 of 13

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

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ACCOUNT: HilCorp-Farmington, NM PROJECT: FEDERAL 18 #IT SDG: L1102729

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

	Kurt	05/24/19 09:30		£D
			05/25/19 08:4	
Dilution	Preparation	Analysis	Analyst	Location
	date/time	date/time		
1	05/31/19 18:50	05/31/19 23:04	MMF	Mt. Juliet, TN
1	05/30/19 11:45	05/30/19 11:45	TH	Mt. Juliet, TN
1	05/31/19 17:43	05/31/19 17:43	RDW	Mt. Juliet, TN
1	06/05/19 01:40	06/05/19 01:40	ELN	Mt. Juliet, TN
1	05/27/19 17:33	05/27/19 17:33	JAH	Mt. Juliet, TN
	Dilution 1 1 1 1 1 1	date/time 1 05/31/19 18:50 1 05/30/19 11:45 1 05/31/19 17:43 1 06/05/19 01:40	date/time date/time 1 05/31/19 18:50 05/31/19 23:04 1 05/30/19 11:45 05/30/19 11:45 1 05/31/19 17:43 05/31/19 17:43 1 06/05/19 01:40 06/05/19 01:40	date/time date/time 1 05/31/19 18:50 05/31/19 23:04 MMF 1 05/30/19 11:45 TH 1 05/31/19 17:43 05/31/19 17:43 RDW 1 06/05/19 01:40 06/05/19 01:40 ELN



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PROJECT: FEDERAL 18 #IT SDG: L1102729 DATE/TIME: 06/05/19 12:59 PAGE: 3 of 13

CASE NARRATIVE

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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.

Japhne R Richards

Daphne Richards Project Manager



ACCOUNT: HilCorp-Farmington, NM PROJECT: FEDERAL 18 #IT SDG: L1102729 DATE/TIME: 06/05/19 12:59 PAGE: 4 of 13 Analyte

Chloride

SAMPLE RESULTS - 01

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Collected date/time: 05/2	4/19 09:30			L1102	729		
Gravimetric Analysis	s by Method 2	540 C-20)11				1
	Result	Qualifier	RDL	Dilution	Analysis	Batch	(
Analyte	mg/l		mg/l		date / time		2
Dissolved Solids	2380		50.0	1	05/31/2019 23:04	WG1288683	2.
Wet Chemistry by N	lethod 9040C	•					3
	Result	Qualifier	Dilution	Analysis	Batch		
Analyte	su			date / time			4
рН	7.15	<u>T8</u>	1	05/30/2019 11:4	5 <u>WG1287178</u>		
Sample Narrative: L1102729-01 WG1287178: 7.15	at 20.20						5
							6
Wet Chemistry by N				Dil vi		D	L
Avelate	Result	Qualifier	RDL	Dilution	Analysis	Batch	/ (
Analyte	umhos/cm		umhos/cr	n	date / time		
Specific Conductance	2760		10.0	1	05/31/2019 17:43	WG1288969	8
Wet Chemistry by N	lethod 9056A	L.					
	Result	Qualifier	RDL	Dilution	Analysis	Batch	9

date / time

06/05/2019 01:40

WG1290504

Volatile Organic Compounds (GC/MS) by Method 8260B

mg/l

13.4

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Benzene	0.0119		0.00100	1	05/27/2019 17:33	WG1287060
Toluene	0.0108		0.00100	1	05/27/2019 17:33	<u>WG1287060</u>
Ethylbenzene	ND		0.00100	1	05/27/2019 17:33	WG1287060
Total Xylenes	ND		0.00300	1	05/27/2019 17:33	<u>WG1287060</u>
(S) Toluene-d8	93.2		80.0-120		05/27/2019 17:33	WG1287060
(S) a,a,a-Trifluorotoluene	103		80.0-120		05/27/2019 17:33	<u>WG1287060</u>
(S) 4-Bromofluorobenzene	100		77.0-126		05/27/2019 17:33	WG1287060
(S) 1,2-Dichloroethane-d4	105		70.0-130		05/27/2019 17:33	WG1287060

1

mg/l

1.00

Gravimetric Analysis by Method 2540 C-2011

QUALITY CONTROL SUMMARY

ONE LAB. NATIONWIDE.

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Method Blank (MB)

(MB) R3417312-1 05/31/19 23:04					
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Dissolved Solids	U		2.82	10.0	

L1102577-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1102577-01 05/31/19	9 23:04 • (DUP)	R3417312-3 0	5/31/19 23	:04		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	980	980	1	0.000		5

Laboratory Control Sample (LCS)

(LCS) R3417312-2 05	(LCS) R3417312-2 05/31/19 23:04					
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	
Analyte	mg/l	mg/l	%	%		
Dissolved Solids	8800	8770	99.7	85.0-115		

DATE/TIME: 06/05/19 12:59

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Wet Chemistry by Method 9040C

QUALITY CONTROL SUMMARY L1102729-01

Sr

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Sc

L1101287-01 Original Sample (OS) • Duplicate (DUP)

OS) L1101287-01 05/30/19 11:45 • (DUP) R3416210-3 05/30/19 11:45										
	Original Result	DUP Result	Dilution	DUP RPD DUP C	lifier DUP RPD Limits					
Analyte	SU	su		%	%					
рН	7.40	7.36	1	0.542	1					
Sample Narrative: OS: 7.4 at 20.7C										

DUP: 7.36 at 20.9C

L1103370-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1103370-01 05/30/19 11:45 • (DUP) R3416210-4 05/30/19 11:45 DUP RPD Original Result DUP Result Dilution DUP RPD DUP Qualifier Limits % % Analyte su su pН 8.47 8.47 1 0.000 1

Sample Narrative:

OS: 8.47 at 20.4C

DUP: 8.47 at 20.4C

Laboratory Control Sample (LCS)

(LCS) R3416210-1 05/30/1	CS) R3416210-1 05/30/19 11:45										
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier						
Analyte	su	su	%	%							
рН	10.0	10.0	100	99.0-101							

Sample Narrative:

LCS: 10 at 20.3C

AC	COUNT:	
HilCorp-F	armington,	NM

PROJECT: FEDERAL 18 #IT

SDG: L1102729

DATE/TIME: 06/05/19 12:59

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Wet Chemistry by Method 9050A

QUALITY CONTROL SUMMARY L1102729-01

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Method Blank (MB)

(MB) R3416821-1 05/31/	MB) R3416821-1 05/31/19 17:43							
	MB Result	MB Qualifier	MB MDL	MB RDL				
Analyte	umhos/cm		umhos/cm	umhos/cm				
Specific Conductance	U		10.0	10.0				

L1101732-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1101732-01 05/31/1	19 17:43 • (DUP) R	3416821-3 05	5/31/19 17:4	3		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	541	541	1	0.000		20

L1103333-06 Original Sample (OS) • Duplicate (DUP)

L1103333-06 Orig	103333-06 Original Sample (OS) • Duplicate (DUP)										
(OS) L1103333-06 05/31/19 17:43 • (DUP) R3416821-4 05/31/19 17:43											
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits		⁸ Al			
Analyte	umhos/cm	umhos/cm		%		%					
Specific Conductance	9520	9520	1	0.000		20		⁹ Sc			

Laboratory Control Sample (LCS)

(LCS) R3416821-2 05/3	_CS) R3416821-2 05/31/19 17:43										
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier						
Analyte	umhos/cm	umhos/cm	%	%							
Specific Conductance	445	444	99.8	85.0-115							

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Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY L1102729-01

Ср

Тс

Ss

Cn

Sr

Qc

Method Blank (MB)

(MB) R3417903-1 06	MB) R3417903-1 06/04/19 17:33							
	MB Result	MB Qualifier	MB MDL	MB RDL				
Analyte	mg/l		mg/l	mg/l				
Chloride	U		0.0519	1.00				

L1102624-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1102624-05 06/04/	(OS) L1102624-05 06/04/19 18:37 • (DUP) R3417903-3 06/04/19 18:54											
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits						
Analyte	mg/l	mg/l		%		%						
Chloride	17.9	18.0	1	0.233		15						

Original Sample (OS) • Duplicate (DUP)

Original Sam	ple (OS) • Duplicate	(DUP)					⁷ Gl			
(OS) • (DUP) R341	(DUP) R3417903-6 06/04/19 23:01									
	Original Result DUP	Result Dilutio	on DUP RPD	DUP Qualifier	DUP RPD Limits		⁸ Al			
Analyte	mg/l		%		%					
Chloride	4.38	8 1	0.341		15		°Sc			

Laboratory Control Sample (LCS)

(LCS) R3417903-2 06/04/19 17:51										
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier					
Analyte	mg/l	mg/l	%	%						
Chloride	40.0	40.1	100	80.0-120						

L1102624-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1102624-05 06/04/	(OS) L1102624-05 06/04/19 18:37 • (MS) R3417903-4 06/04/19 19:12 • (MSD) R3417903-5 06/04/19 19:30												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%	
Chloride	50.0	17.9	66.8	67.2	97.9	98.5	1	80.0-120			0.466	15	

Original Sample (OS) • Matrix Spike (MS)

(OS) • (MS) R3417903-7	06/04/19 23:19					
	Spike Amount Original I	Result MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/l	mg/l	%		%	
Chloride	50.0	54.1	99.4	1	80.0-120	

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Volatile Organic Compounds (GC/MS) by Method 8260B

QUALITY CONTROL SUMMARY L1102729-01

ONE LAB. NATIONWIDE.

Cp

⁶Qc

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°Sc

Method Blank (MB)

(MB) R3416171-2 05/27/19	08:41				
	MB Result	MB Qualifier	MB MDL	MB RDL	2
Analyte	mg/l		mg/l	mg/l	T
Benzene	U		0.000331	0.00100	
Ethylbenzene	U		0.000384	0.00100	³ Ss
Toluene	U		0.000412	0.00100	
Xylenes, Total	U		0.00106	0.00300	4
(S) Toluene-d8	95.7			80.0-120	Cr
(S) a,a,a-Trifluorotoluene	106			80.0-120	
(S) 4-Bromofluorobenzene	105			77.0-126	⁵ Sr
(S) 1,2-Dichloroethane-d4	101			70.0-130	

Laboratory Control Sample (LCS)

(LCS) R3416171-1 05/27/19	07:40				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Benzene	0.0250	0.0291	117	70.0-123	
Ethylbenzene	0.0250	0.0266	107	79.0-123	
Toluene	0.0250	0.0236	94.3	79.0-120	
Xylenes, Total	0.0750	0.0737	98.3	79.0-123	
(S) Toluene-d8			89.5	80.0-120	
(S) a,a,a-Trifluorotoluene			103	80.0-120	
(S) 4-Bromofluorobenzene			102	77.0-126	
(S) 1,2-Dichloroethane-d4			115	70.0-130	

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GLOSSARY OF TERMS

*

Τс

Ss

Cn

Sr

*Q*c

GI

AI

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.

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.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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

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0	

Sample(s) received past/too close to holding time expiration.

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ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

State Accreditations

Alabama	40660	Nebrask
Alaska	17-026	Nevada
Arizona	AZ0612	New Ha
Arkansas	88-0469	New Je
California	2932	New Me
Colorado	TN00003	New Yo
Connecticut	PH-0197	North C
Florida	E87487	North C
Georgia	NELAP	North C
Georgia ¹	923	North D
Idaho	TN00003	Ohio-V
Illinois	200008	Oklahor
Indiana	C-TN-01	Oregon
lowa	364	Pennsyl
Kansas	E-10277	Rhode I
Kentucky 16	90010	South C
Kentucky ²	16	South D
Louisiana	AI30792	Tenness
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermon
Michigan	9958	Virginia
Minnesota	047-999-395	Washing
Mississippi	TN00003	West Vi
Missouri	340	Wiscons
Montana	CERT0086	Wyomin

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee 1 4	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

Third Party Federal Accreditations

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

Our Locations

HilCorp-Farmington, NM

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



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DW - Drinking Water OT - Other	Samples returned via: UPS VFedExCourier				Tracking #	5	- 8		17	7 4963		<u> </u>	Sufficient volume sent:			le	
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