L Peter Galusky, Jr PE

5935 Exeter Circle Norcross, GA 30071 | 470 955-5335 | peter@bluerock.pro

April 1st, 2020

Bradford Billings

New Mexico Energy, Minerals, & Natural Resources Oil Conservation Division, Environmental Bureau 1220 S. St. Francis Drive Santa Fe, New Mexico 87504

Re: **2019 Annual Report**

Vacuum F-35 & G-35 SWDs, Sec 35, T17S, R35E

OCD Case No. AP-59

Sent via E-mail

Mr. Billings:

This letter summarizes the results of groundwater monitoring over the past year pursuant to the NMOCD approved Abatement Plan for Rice Operating Company (ROC)'s Vacuum F&G-35 project. Site and monitor well locations are given in Figures 1 & 2, respectively.

Vacuum F-35 SWD

Data for Vacuum F-35 SWD are summarized in Figure 3 and Table 1a. The full dataset is given in Table 1b.

Groundwater was not sampled in the at-source monitor well (MW-1) during 2019 as free product skim was observed. We have placed a recovery sock in the well and will attempt to sample it during 2020. Average annual groundwater chloride concentrations in the shallow down-gradient well (MW-3S) remained relatively steady at 80 mg/l in 2019 vs. 50 mg/l in 2018, and dropped in the deep down-gradient monitor well (MW-3D) averaging 86 mg/l in 2019 versus 122 mg/l in 2018.

Vacuum G-35 SWD

Data for Vacuum G-35 SWD are summarized in Figure 4 and Table 2a. The full dataset is given in Table 2b.

Average annual groundwater chloride concentrations in the at-source monitor well (MW-1) dropped from 82 mg/l in 2018 to 68 mg/l in 2019. Average annual chloride concentrations in the

Rice Operating Company Vacuum F&G 35 SWD Annual Report

shallow down-gradient well (MW-3S) dropped considerably from 254 mg/l in 2018 to 126 mg/l in 2019. Average annual chloride concentrations in the deep down-gradient well (MW-3D) also dropped, measuring 248 mg/l in 2018 versus 142 mg/l in 2019. Average annual groundwater chlorides in the near-source down-gradient monitor well (MW-4) dropped from 184 mg/l in 2018 to 144 mg/l in 2019.

Average annual total BTEX concentrations in the at-source monitor well (MW-1) dropped considerably from to 0.0580 mg/l in 2018 to .0095 mg/l in 2019, a tiny fraction of maximum measured value of 2.2385 mg/l measured in in 2005. Average annual total BTEX concentrations in the near-source down-gradient well (MW-4) also dropped significantly, from 0.0530 mg/l in 2018 to 0.0150 mg/l, also a tiny fraction of the maximum measured value 1.0085 measured in 2012.

Groundwater chloride concentrations have dropped considerably at both locations through dilution of an apparently relatively small original mass. BTEX concentrations have clearly dropped at G-35. However, the recent emergence of free product sheen in the at-source monitor well (MW-1) at F-35 clearly warrants further evaluation.

ROC will continue to monitor groundwater concentrations on a semi-annual basis at both sites in 2020.

ROC is the service provider (agent) for the Vacuum Saltwater Disposal (SWD) System and has no ownership of any portion of the pipeline, well, or facility. The system is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis. The Vacuum system is now abandoned. We thus submit this report for your review and consideration. Please call Rice Operating Company or me if you have any questions or need additional information. Thank you.

Sincerely,

L. Peter Galusky, Jr. P.E.

Copy: Rice Operating Company Attachments: ... as noted, above.

Geographic Location **APPENDIX** FIGURE 1 16 13 18 24 20 22 23 175 34E 25 BUCKEYE BUCKEYEROAD G-35 SWD F-35 SWD 36 18S 35E Legend 10 Landowner: State Source: Esti, DigitalGlobe, GeoBye, Bartistar Geo USBA, USGS, AeroGRID, IGN, and the GIS User 6 DGW: 52 ft GPS: F-35 SWD 32.793056 -103.430348 **VACUUM** QUE COMPERATING COMPARY G-35 SWD 32.793016 -103.426052 F-35 & G-35 NAD83 STATE PLANE PROJ NM EAST ZONE SWD 2,500 5.000

AP-59

ULF & G SECTION 35 T17S, R35E

LEA COUNTY, NM

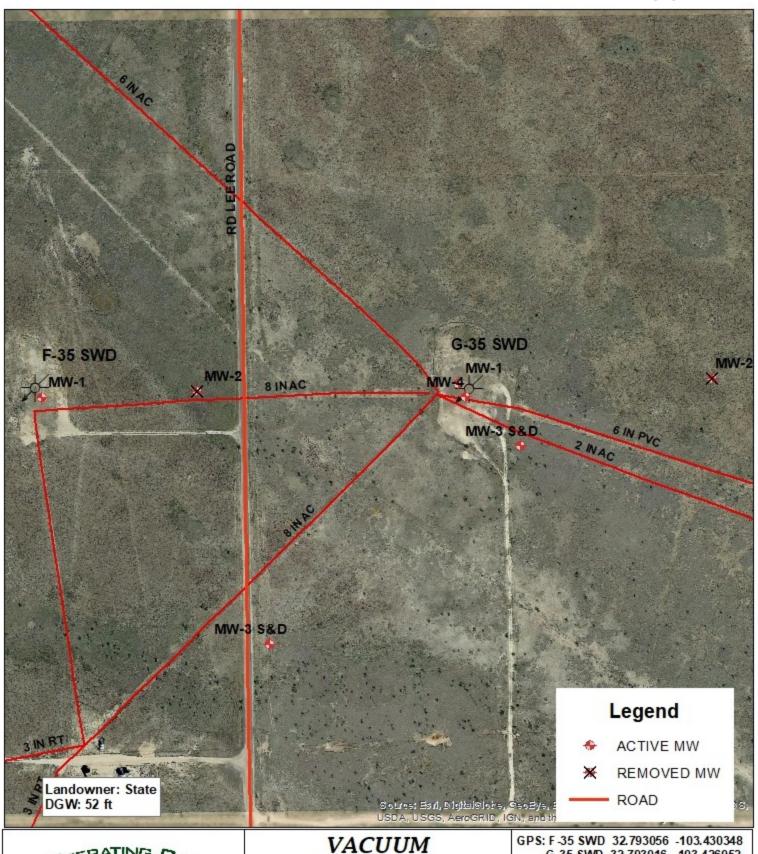
SINCE 1955

0

Drawing date: 2/4/20

Drafted by: T. Grieco

Feet

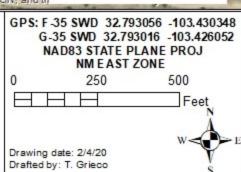




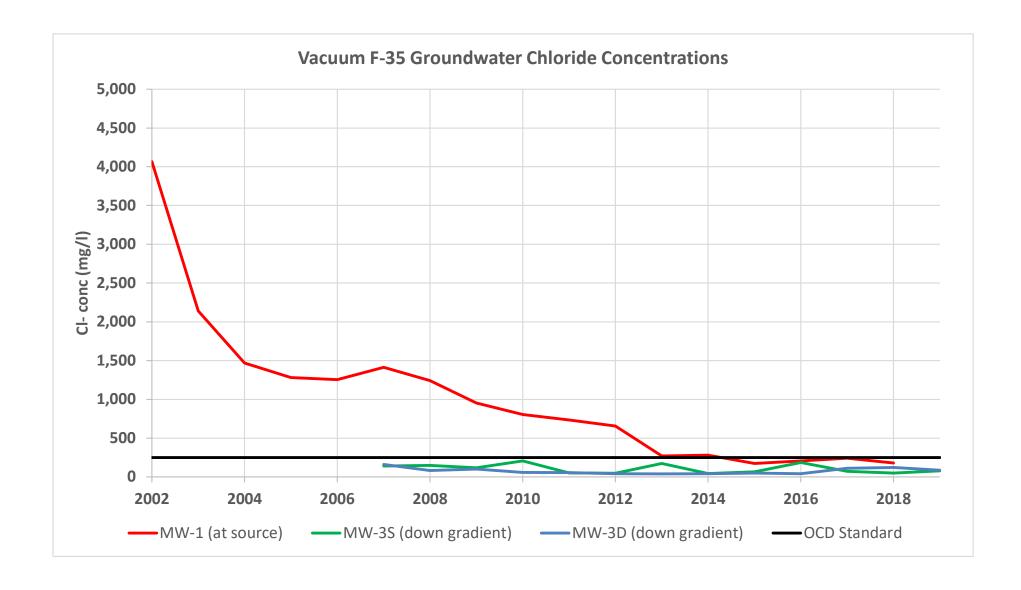
VACUUM F-35 & G-35 SWD

AP-59

UL F & G SECTION 35 T17S, R35E LEA COUNTY, NM



APPENDIX FIGURE 3



APPENDIX TABLE 1a

Vacuum F-35 SWD

Groundwater Data Annual Average Values

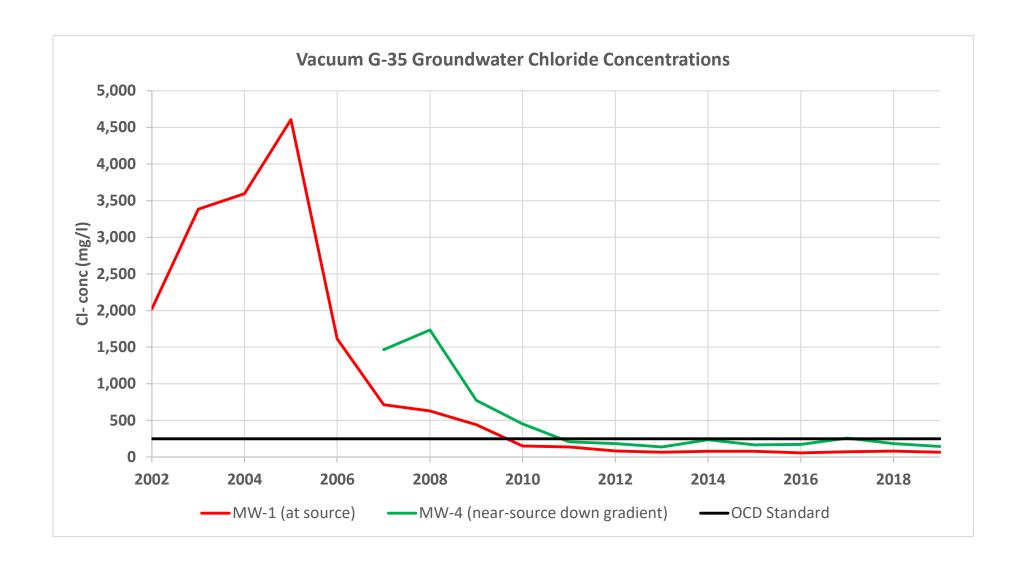
ter Bata / till		be values						
Chlorides (n	ng/l)			Total BTEX (mg/l)			
	MW-2	MW-3S	MW-3D		MW-2	MW-3S	MW-3D	
MW-1 (at	(east of	(down	(down	MW-1 (at	(east of	(down	(down	
source)	source)	gradient)	gradient)	source)	source)	gradient)	gradient)	
4,068				1.4743				
2,140				1.5173				
1,470				0.9398				
1,283				3.3751				
1,255	89			1.2779				
1,413	96	139	161	2.2188	0.0000	0.0000	0.0000	
1,243	98	149	81	0.6153	0.0000	0.0000	0.0000	
953	80	116	102	0.6970				
805	128	206	56	0.4458				
735		52	54	0.4920				
655		48	42	0.2040				
270		172	38	0.2745				
280		42	40	0.1405				
172		66	50	0.2670				
206		186	40	0.1435				
242		72	110	0.1210				
180		50	122	0.1250				
		80	86					
	Chlorides (no. MW-1 (at source) 4,068 2,140 1,470 1,283 1,255 1,413 1,243 953 805 735 655 270 280 172 206 242	Chlorides (mg/l) MW-2 MW-1 (at (east of source) source) 4,068 2,140 1,470 1,283 1,255 89 1,413 96 1,243 98 953 80 805 128 735 655 270 280 172 206 242	MW-1 (at (east of (down source) source) gradient) 4,068 2,140 1,470 1,283 1,255 89 1,413 96 1,243 98 149 953 80 116 805 128 206 735 52 655 48 270 172 280 42 172 280 42 172 280 42 172 280 42 172 280 42 172 50	Chlorides (mg/l) MW-1 (at (east of (down (down source) source) gradient) gradient) 4,068 2,140 1,470 1,283 1,255 89 1,413 96 139 161 1,243 98 149 81 953 80 116 102 805 128 206 56 735 52 54 655 48 42 270 172 38 280 42 40 172 66 50 206 186 40 242 72 110 180 50 122	Chlorides (mg/l) Total BTEX (MW-1 (at (east of (down (down source)) MW-1 (at source) gradient) gradient) source) 4,068 1.4743 1.5173 1.5173 1,470 0.9398 3.3751 1.2779 1,255 89 1.2779 1.2779 1,413 96 139 161 2.2188 1,243 98 149 81 0.6153 953 80 116 102 0.6970 805 128 206 56 0.4458 735 52 54 0.4920 655 48 42 0.2040 270 172 38 0.2745 280 42 40 0.1405 172 66 50 0.2670 206 186 40 0.1435 242 72 110 0.1210 180 50 122 0.1250	Chlorides (mg/l) Total BTEX (mg/l) MW-1 (at (east of source) source) MW-3S (down (down source)) MW-1 (at (east of source)) MW-2 AW-2 Get of source) source)	Chlorides (mg/l) Total BTEX (mg/l) MW-1 (at (east of source) source) MW-3S (down source) gradient) MW-1 (at (east of down source) source) MW-2 (down source) source) MW-3S (down source) source) gradient) 4,068 (2,140) 1.4743 1.5173<	Total BTEX (mg/l) MW-1 (at least of source) MW-3S least of (down source) MW-3D least of (down source) MW-1 (at least of (down source) MW-1 (at least of (down source) MW-3D least of (down source) Source) source) source) gradient) gradient) gradient)

APPENDIX TABLE 1b

Vacuum F-35 SWD Groundwater Data

	Chlorides (m	ng/l)			Total BTEX (mg/l)		
		MW-2	MW-3S	MW-3D			MW-3S	MW-3D
	MW-1 (at	(east of	(down	(down	MW-1 (at		(down	(down
Date	source)	source)	gradient)	gradient)	source)	MW-2	gradient)	gradient)
1/10/2002	5,200				0.243			
5/15/2002	3,720				1.770			
8/19/2002	3,630				1.065			
11/11/2002	3,720				2.819			
2/28/2003	2,200				2.194			
6/5/2003	2,300				0.894			
8/21/2003	2,060				1.371			
11/19/2003	2,000				1.610			
2/18/2004	1,819				0.535			
5/27/2004	1,759				1.385			
9/7/2004	1,040				1.018			
11/24/2004	1,260				0.822			
3/21/2005	1,220				5.941			
5/11/2005	1,490							
8/15/2005	1,340				2.462			
10/25/2005	1,080				1.722			
1/23/2006	886				1.250			
4/25/2006	1,420				0.658			
10/24/2006	1,460	89.1			1.926			
1/9/2007	1,510	101	144	133	1.581	0.000	0.000	0.000
5/23/2007	1,500	88.3	117	92	1.948	0.000	0.000	0.000
9/19/2007	1,380	100	192	204	3.330	0.000	0.000	0.000
11/19/2007	1,260	96	104	216	2.016	0.000	0.000	0.000
2/15/2008	1,240	100	212	52	1.185	0.000	0.000	0.000
6/3/2008	1,460	96	116	104	0.000	0.000	0.000	0.000
7/28/2008	1,120	96	164	96	0.312	0.000	0.000	0.000
10/23/2008	1,150	100	104	72	0.964	0.000	0.000	0.000
1/28/2009	1,150	96	100	84	1.169			
4/28/2009	980	100	128	60	0.814			
8/5/2009	740	104	128	56	0.439			
10/26/2009	940	20	108	208	0.366			
3/3/2010	970	124	108	56	0.337			
5/12/2010	880	128	80	64	0.145			
8/4/2010	630	132	64	52	0.215			
11/1/2010	740		570	52	1.086			
6/2/2011	900		52	68	0.533			
11/30/2011	570		52	40	0.451			
5/25/2012	580		52	44	0.240			
11/13/2012	730		44	40	0.168			
6/6/2013	280		292	32	0.367			
11/18/2013	260		52	44	0.182			
6/26/2014	296		56	52	0.102			
12/10/2014	264		28	28	0.179			
6/24/2015	172		52	56	0.116			
11/11/2015	172		80	44	0.418			
5/23/2016	196		300	40	0.131			
11/15/2016	216		72	40	0.156			
5/31/2017	232		84	168	0.162			
12/5/2017	252		60	52	0.080			
5/23/2018	192		36	164	0.175			
11/27/2018	168		64	80	0.075			
6/7/2019			84	96				
11/18/2019			76	76				

APPENDIX FIGURE 4



APPENDIX TABLE 2a

Vacuum G-35 SWD

Groundwater Data Annual Average Values

Chlorides (mg/l) Total BTEX (mg/l) MW-4 MW-4 (near-(near-MW-2 MW-3S MW-3D source MW-2 MW-3S MW-3D source MW-1 (at down (east of (down (down down MW-1 (at (east of (down (down source) source) gradient) gradient) gradient) source) source) gradient) gradient) gradient) year 2002 2,025 0.9595 2003 3,383 0.6598 2004 3,595 1.3313 2005 4,608 2.2385 2006 0.0000 1,617 13 0.5540 0.1738 2007 717 16 547 525 1,467 0.2076 0.0000 0.0048 0.0034 2008 630 16 661 858 1,735 0.8547 0.0000 0.0000 0.0000 0.6803 2009 442 41 663 1,113 775 0.5543 0.0000 0.2408 2010 152 17 508 828 455 0.0580 0.0000 0.0658 2011 138 775 750 208 0.1260 0.0130 2012 84 715 990 186 0.1165 1.0085 2013 545 68 985 138 0.0570 0.3595 2014 78 330 675 238 0.0080 0.4935 2015 80 332 519 166 0.0405 0.1850 2016 296 58 298 174 0.0035 0.0630 272 2017 72 308 258 0.0015 0.0930 2018 82 254 248 0.0580 184 0.0530 2019 68 126 142 0.0095 144 0.0150

APPENDIX TABLE 2b

Vacuum G-35 SWD Groundwater Data

Groundwater	hlorides (m	na/I)				Total BTEX (m	σ/I\			
	illollues (III	ig/ i)			MW-4	TOTAL BIEX (III	B/ ')			MW-4
					(near-					(near-
					source					source
					down					down
Date	MW-1	MW-2	MW-3S	MW-3D	gradient)	MW-1	MW-2	MW-3S	MW-3D	gradient)
1/10/2002	568					0.1220				
5/15/2002	1,950					0.6670				
8/19/2002	1,950					1.7650				
11/11/2002	3,630					1.2840				
2/28/2003	2,730					0.7680				
5/22/2003	3,860					0.7320				
8/21/2003	5,010					1.0320				
11/19/2003	1,930					0.1070				
2/18/2004	2,579					0.4160				
5/27/2004	1,899					2.1540				
9/7/2004	4,700					1.6467				
11/24/2004	5,200					1.1083				
3/21/2005	5,750					3.6922				
5/11/2005	5,890									
8/15/2005	4,430					1.9337				
10/25/2005	2,360					1.0896				
1/23/2006	1,960					0.2419				
4/25/2006	1,540	42				0.8845	0.0000			
10/25/2006	1,350	13	211	212		0.5356	0.0000	0.0101	0.0126	
1/9/2007	873	14	311	313	1 200	0.2839	0.0000	0.0191	0.0136	0.1555
5/24/2007	873	17 16	599 500	648	1,200	0.2395	0.0000	0.0000	0.0000	0.1555
9/20/2007 11/20/2007	800 320	16 16	500	570 570	1,600	0.3040	0.0000	0.0000	0.0000	0.2690
2/4/2008	540	16 16	776 670	570 920	1,600	0.0030	0.0000	0.0000	0.0000	0.0970 0.7360
4/29/2008	440	16 16	670 750	820 930	2,680 1,800	0.3650 0.2410	0.0000	0.0000	0.0000	1.0770
7/29/2008	860	16	760	1,010	1,420	0.2410	0.0000	0.0000	0.0000	0.3950
10/23/2008	680	16	464	670	1,040	1.9580	0.0000	0.0000	0.0000	0.5130
1/26/2009	500	16	710	1,560	730	1.2090	0.0000	0.0000	0.0000	0.4630
4/27/2009	550	16	630	1,080	940	0.5420	0.0000			0.1990
8/6/2009	384	16	710	1,090	770	0.3020	0.0000			0.2490
10/23/2009	332	116	600	720	660	0.1640	0.0000			0.0520
3/3/2010	232	16	740	810	670	0.1330	0.0000			0.2020
5/13/2010	152	16	660	760	500	0.0210	0.0000			0.0140
8/3/2010	124	20	580	790	396	0.0330	0.0000			0.0270
11/1/2010	100		52	950	252	0.0450				0.0200
6/2/2011	156		770	570	328	0.1190				0.0090
11/30/2011	120		780	930	88	0.1330				0.0170
5/25/2012	100		830	940	280	0.1460				1.1370
11/13/2012	68		600	1,040	92	0.0870				0.8800
6/6/2013	72		630	1,040	96	0.0030				0.3130
11/18/2013	64		460	930	180	0.1110				0.4060
6/26/2014	68		428	940	144	0.0030				0.5580
12/9/2014	88		232	410	332	0.0130				0.4290
6/23/2015	84		348	328	180	0.0770				0.2220
11/12/2015	76		316	710	152	0.0040				0.1480
5/24/2016	56		300	304	204	0.0020				0.1230
11/14/2016	60		292	292	144	0.0050				0.0030
5/30/2017	52		296	392	312	0.0000				0.1440
12/4/2017	92		248	224	204	0.0030				0.0420
5/22/2018	88		232	260	208	0.0120				0.0510
11/26/2018	76		276 116	236	160	0.1040				0.0550
6/6/2019	64 72		116 126	116	148	0.0120				0.0170
11/19/2019	72		136	168	140	0.0070				0.0130



June 20, 2019

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM F-35 SWD AND G-35 SWD

Enclosed are the results of analyses for samples received by the laboratory on 06/11/19 13:45.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab accred certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2 Haloacetic Acids (HAA-5)
Method EPA 524.2 Total Trihalomethanes (TTHM)
Method EPA 524.4 Regulated VOCs (V1, V2, V3)

Celey D. Keine

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

06/07/2019

Water



Analytical Results For:

Rice Operating Company KATIE JONES 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received: 06/11/2019 Sampling Date:
Reported: 06/20/2019 Sampling Type:

Project Name: VACUUM F-35 SWD AND G-35 SWD Sampling Condition: Cool & Intact
Project Number: NOT GIVEN Sample Received By: Tamara Oldaker

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM

Sample ID: F -35 SWD MONITOR WELL #3- SHALLOW (H902024-01)

Chloride, SM4500CI-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	84.0	4.00	06/18/2019	ND	96.0	96.0	100	4.08	
Sulfate 375.4	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	49.7	10.0	06/17/2019	ND	16.2	81.2	20.0	1.11	
TDS 160.1	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	399	5.00	06/13/2019	ND	525	99.6	527	10.3	

Sample ID: F -35 SWD MONITOR WELL #3- DEEP (H902024-02)

Chloride, SM4500Cl-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	96.0	4.00	06/18/2019	ND	96.0	96.0	100	4.08	
Sulfate 375.4	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	55.2	10.0	06/17/2019	ND	16.2	81.2	20.0	1.11	
TDS 160.1	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	428	5.00	06/13/2019	ND	525	99.6	527	10.3	

Cardinal Laboratories *=Accredited Analyte

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Rice Operating Company KATIE JONES 112 W. Taylor Hobbs NM, 88240

Fax To: (575) 397-1471

Received: 06/11/2019 Reported: 06/20/2019

VACUUM F-35 SWD AND G-35 SWD

Project Number: NOT GIVEN

Project Name:

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM

Sampling Date: 06/06/2019
Sampling Type: Water

Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: G-35 SWD MONITOR WELL #1 (H902024-03)

BTEX 8021B	mg/	L	Analyze	d By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.004	0.001	06/17/2019	ND	0.021	107	0.0200	0.889	
Toluene*	<0.001	0.001	06/17/2019	ND	0.022	109	0.0200	0.536	
Ethylbenzene*	0.014	0.001	06/17/2019	ND	0.020	99.9	0.0200	1.37	
Total Xylenes*	0.003	0.003	06/17/2019	ND	0.061	101	0.0600	0.642	
Total BTEX	0.021	0.006	06/17/2019	ND					
Surrogate: 4-Bromofluorobenzene (PID	105 %	% 81.3-12	8						
Chloride, SM4500CI-B	mg/	L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	64.0	4.00	06/18/2019	ND	96.0	96.0	100	4.08	
Sulfate 375.4	mg/	L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	36.2	10.0	06/17/2019	ND	16.2	81.2	20.0	1.11	
TDS 160.1	mg/	L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	439	5.00	06/14/2019	ND	436	82.7	527	0.686	

Cardinal Laboratories *=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whistoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results related only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Rice Operating Company KATIE JONES 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-14

Fax To: (575) 397-1471

 Received:
 06/11/2019
 Sampling Date:
 06/06/2019

 Reported:
 06/20/2019
 Sampling Type:
 Water

Project Name: VACUUM F-35 SWD AND G-35 SWD Sampling Condition: Cool & Intact
Project Number: NOT GIVEN Sample Received By: Tamara Oldaker

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM

Sample ID: G-35 SWD MONITOR WELL #3 - SHALLOW (H902024-04)

Chloride, SM4500Cl-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	116	4.00	06/18/2019	ND	ND 96.0		100	4.08	
Sulfate 375.4	mg,	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	27.1	10.0	06/17/2019	ND	16.2	81.2	20.0	1.11	
TDS 160.1	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	806	5.00	06/14/2019	ND	436	82.7	527	0.686	

Sample ID: G-35 SWD MONITOR WELL #3- DEEP (H902024-05)

Chloride, SM4500Cl-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	192	4.00	06/18/2019	ND	96.0	96.0	100	4.08	
Sulfate 375.4	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	26.2	10.0	06/17/2019	ND	16.2	81.2	20.0	1.11	
TDS 160.1	mg,	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	946	5.00	06/14/2019	ND	436	82.7	527	0.686	

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Rice Operating Company KATIE JONES 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received: 06/11/2019 Reported: 06/20/2019

VACUUM F-35 SWD AND G-35 SWD

Project Number: NOT GIVEN

Project Name:

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM

Sampling Date: 06/06/2019
Sampling Type: Water

Sampling Condition: Cool & Intact
Sample Received By: Tamara Oldaker

Sample ID: G-35 SWD MONITOR WELL #4 (H902024-06)

BTEX 8021B	mg/	/L	Analyze	d By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.009	0.001	06/18/2019	ND	0.021	107	0.0200	0.889	
Toluene*	0.004	0.001	06/18/2019	ND	0.022	109	0.0200	0.536	
Ethylbenzene*	0.004	0.001	06/18/2019	ND	0.020	99.9	0.0200	1.37	
Total Xylenes*	<0.003	0.003	06/18/2019	ND	0.061	101	0.0600	0.642	
Total BTEX	0.017	0.006	06/18/2019	ND					
Surrogate: 4-Bromofluorobenzene (PID	102 9	% 81.3-12	18						
Chloride, SM4500CI-B	mg/	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	148	4.00	06/18/2019	ND	96.0	96.0	100	4.08	
Sulfate 375.4	mg/	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	28.7	10.0	06/17/2019	ND	16.2	81.2	20.0	1.11	
TDS 160.1	mg/	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	574	5.00	06/14/2019	ND	436	82.7	527	0.686	

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Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS

recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

** Samples not received at proper temperature of 6°C or below.

*** Insufficient time to reach temperature.

Chloride by SM4500Cl-B does not require samples be received at or below 6°C

Samples reported on an as received basis (wet) unless otherwise noted on report

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H902024			(n	_	1		_	느	IV	IETH	HOD				4		15		Ba	Ba	S			GC/MS Vol. 8260B/624	827	8	8		Cations (Ca, Mg, Na, K)	lg	Sulfates Total Dissolved Solids	1	~
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December 05, 2019

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM F-35 SWD AND G-35 SWD

Enclosed are the results of analyses for samples received by the laboratory on 11/21/19 12:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-19-12. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab accred certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2 Haloacetic Acids (HAA-5)
Method EPA 524.2 Total Trihalomethanes (TTHM)
Method EPA 524.4 Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

Celey D. Keine

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager



Rice Operating Company KATIE JONES 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

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Received: 11/21/2019 Sampling Date: 11/18/2019
Reported: 12/05/2019 Sampling Type: Water

Project Name: VACUUM F-35 SWD AND G-35 SWD Sampling Condition: Cool & Intact
Project Number: NOT GIVEN Sample Received By: Tamara Oldaker

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM

Sample ID: F -35 SWD MONITOR WELL #3- SHALLOW (H903954-01)

•			•	•					
Chloride, SM4500CI-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	76.0	4.00	11/22/2019	ND	104	104	100	0.00	
Sulfate 375.4	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	48.5	10.0	11/27/2019	ND	18.3	91.6	20.0	18.5	
TDS 160.1	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	236	5.00	11/27/2019	ND	515	97.7	527	15.3	

Sample ID: F-35 SWD MONITOR WELL #3- DEEP (H903954-02)

Chloride, SM4500CI-B	mg,	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	76.0	4.00	11/22/2019	ND	104	104	100	0.00	
Sulfate 375.4	ulfate 375.4 mg/L								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	48.0	10.0	11/27/2019	ND	18.3	91.6	20.0	18.5	
TDS 160.1	mg,	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	273	5.00	11/27/2019	ND	515	97.7	527	15.3	

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Received: 11/21/2019 Reported: 12/05/2019

VACUUM F-35 SWD AND G-35 SWD

Project Number: NOT GIVEN

Project Name:

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM Sampling Date: 11/19/2019 Sampling Type: Water

Sampling Condition: Cool & Intact Sample Received By: Tamara Oldaker

Sample ID: G-35 SWD MONITOR WELL #1 (H903954-03)

BTEX 8021B	mg/	L	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.002	0.001	11/24/2019	ND	0.019	96.8	0.0200	0.956	
Toluene*	< 0.001	0.001	11/24/2019	ND	0.019	93.7	0.0200	0.628	
Ethylbenzene*	0.005	0.001	11/24/2019	ND	0.019	95.4	0.0200	0.648	
Total Xylenes*	<0.003 0.003		11/24/2019	ND	0.058	95.9	0.0600	0.741	
Total BTEX	0.007 0.006		11/24/2019 ND						
Surrogate: 4-Bromofluorobenzene (PID	99.4 % 58.2-133		3						
Chloride, SM4500Cl-B	mg/	L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Analyzed Method Blank		% Recovery	True Value QC	RPD	Qualifier
Chloride*	72.0	4.00	11/22/2019	ND	104	104	100	0.00	
Sulfate 375.4	mg/	L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	33.0	10.0	11/27/2019	ND	18.3	91.6	20.0	18.5	
TDS 160.1	mg/	L	Analyze	d By: AC					
Analyte	Result Reporting Limit		Analyzed	Method Blank	BS	% Recovery	True Value OC	RPD	Qualifier
	Result	Reporting Limit	Analyzeu	Mediod blank	DS	70 INCCOVERY	True value qe	INI D	Qualifici

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Fax To: (575) 397-1471

Received: 11/21/2019 Reported: 12/05/2019

VACUUM F-35 SWD AND G-35 SWD

Project Number: NOT GIVEN

Project Name:

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM

Sampling Date: 11/19/2019 Sampling Type: Water

Sampling Condition: water

Cool & Intact

Sample Received By: Tamara Oldaker

Sample ID: G-35 SWD MONITOR WELL #3 - SHALLOW (H903954-04)

Chloride, SM4500Cl-B	mg,	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	136	4.00	11/22/2019	ND	104	104	100	0.00	
Sulfate 375.4	/L	Analyze	d By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	38.8	10.0	11/27/2019	ND	18.3	91.6	20.0	18.5	
TDS 160.1	mg,	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	471	5.00	11/27/2019	ND	515	97.7	527	15.3	

Sample ID: G-35 SWD MONITOR WELL #3- DEEP (H903954-05)

Chloride, SM4500Cl-B	Analyze	d By: AC							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	168	4.00	11/22/2019	ND	104	104	100	0.00	
Sulfate 375.4	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	27.8	10.0	11/27/2019	ND	18.3	91.6	20.0	18.5	
TDS 160.1	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	535	5.00	11/27/2019	ND	515	97.7	527	15.3	

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Fax To: (575) 397-1471

Received: 11/21/2019 Reported: 12/05/2019

Project Name: VACUUM F-35 SWD AND G-35 SWD

Project Number: NOT GIVEN

Project Location: T17S-R35E-SEC35 F&G-LEA CTY., NM Sampling Date: 11/19/2019 Sampling Type: Water

Sampling Condition: Cool & Intact Sample Received By: Tamara Oldaker

Sample ID: G-35 SWD MONITOR WELL #4 (H903954-06)

BTEX 8021B	mg/	L	Analyze	d By: MS					
Analyte	Analyte Result Reporting Lin		Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.007	0.001	11/24/2019	ND	0.019	96.8	0.0200	0.956	
Toluene*	0.003	0.001	11/24/2019	ND	0.019	93.7	0.0200	0.628	
Ethylbenzene*	0.003	0.001	11/24/2019	ND	0.019	95.4	0.0200	0.648	
Total Xylenes*	<0.003	0.003	11/24/2019	ND	0.058	95.9	0.0600	0.741	
Total BTEX	0.013 0.006		11/24/2019 ND						
Surrogate: 4-Bromofluorobenzene (PID	99.3 % 58.2-133		3						
Chloride, SM4500CI-B	mg/	L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Analyzed Method Blank		% Recovery	True Value QC	RPD	Qualifier
Chloride*	140	4.00	11/22/2019	ND	104	104	100	0.00	
Sulfate 375.4	mg/	L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	28.2	10.0	11/27/2019	ND	18.3	91.6	20.0	18.5	
TDS 160.1	mg/	L	Analyze	d By: AC					
Analyte	Result Reporting Limit					0		DDD	0 1:0
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier

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Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS

recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

** Samples not received at proper temperature of 6°C or below.

*** Insufficient time to reach temperature.

Chloride by SM4500Cl-B does not require samples be received at or below 6°C

Samples reported on an as received basis (wet) unless otherwise noted on report

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