

L. Peter Galusky, Jr. P.E.

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March 31st, 2016

Dr. Tomas Oberding

New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

Re: 2015 Annual Report

Rice Operating Company – Vacuum SWD System
Vacuum F-34 Vent Boot UL F, Section 34, Township 17S, Range 35E
NMOCD Case Number 1R425-67

Sent by E-mail

Dr. Oberding:

This Annual Report is submitted to NMOCD for Rice Operating Company's (ROC) Vacuum F-34 Vent Boot project in Lea County, New Mexico.

Background and Brief Project History

The site is located approximately 2.5 miles east-southeast of Buckeye, New Mexico (Appendix - Figure 1). The regional topography slopes gently toward the southeast. Groundwater is encountered at a depth of approximately 70 ft below ground surface in the Ogallala Formation.

The junction box at this location was removed during the Vacuum SWD system abandonment and conducted an initial soils evaluation in 2008. The results of an NMOCD approved Investigation and Characterization Plan (ICP) indicated elevated levels of soil and groundwater chlorides, and a Notification of Groundwater Impact was submitted to NMOCD on October 26th, 2010. ROC installed a double synthetic subsurface soil liner and completed surface restoration in May 2011 and NMOCD granted vadose zone remediation termination status or 'soil closure,' on September 15th, 2011. A Project Update was submitted to NMOCD on August 8th, 2013, and proposed continued groundwater monitoring and limited groundwater withdrawal from the near-source well (MW-1) to determine if this would effectively reduce groundwater chloride mass. NMOCD approved this work in August 13th, 2013. The location of the monitoring wells is shown in the Appendix, Figure 2.

Past Year and Current Status

ROC began groundwater recovery from MW-1 in April of 2014. A total of 5,327 bbls of groundwater and 754 kg of chloride have been removed since pumping began through November 2015 when the system was shut down for winter. In looking at the plotted quarterly

VAC F-34 Vent Boot

measurements it does not immediately appear that these withdrawals have yet caused a reduction in near-source groundwater chloride concentrations, as these have continued to oscillate around a mean value of approximately 798 mg/l similar to previous years (Appendix - Figure 3, blue line; Table 1). However, it is clear from the moving averages (Appendix - Figure 3, black line; Table 1) that pumping has accelerated the downward trend in groundwater chloride concentrations that began in 2012. This suggests that the mass of chlorides in the groundwater is sufficiently small that natural dilution and limited pumping can reduce their concentration.

Chlorides in the up-gradient well MW-2 remained below 100 mg/l as they mostly have from 2011 through 2015 (Appendix – Figure 3, Table 2). BTEX has remained below laboratory detection levels in both up-gradient and down-gradient monitor wells as it has since sampling began (Appendix – Table 1&2).

Groundwater withdrawals will resume in 2016 and continue until freezing weather begins in the fall. We will then analyze the data and see if another year of pumping have a demonstrable effect on groundwater chloride concentrations. It should be noted that the removed groundwater is used for pipeline and well maintenance purposes.

ROC is the service provider (agent) for the Vacuum 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 system is now abandoned.

Please call either myself or Katie Jones of Rice Operating Company if you have any questions or wish to discuss this matter. Thank you for your consideration.

Sincerely,

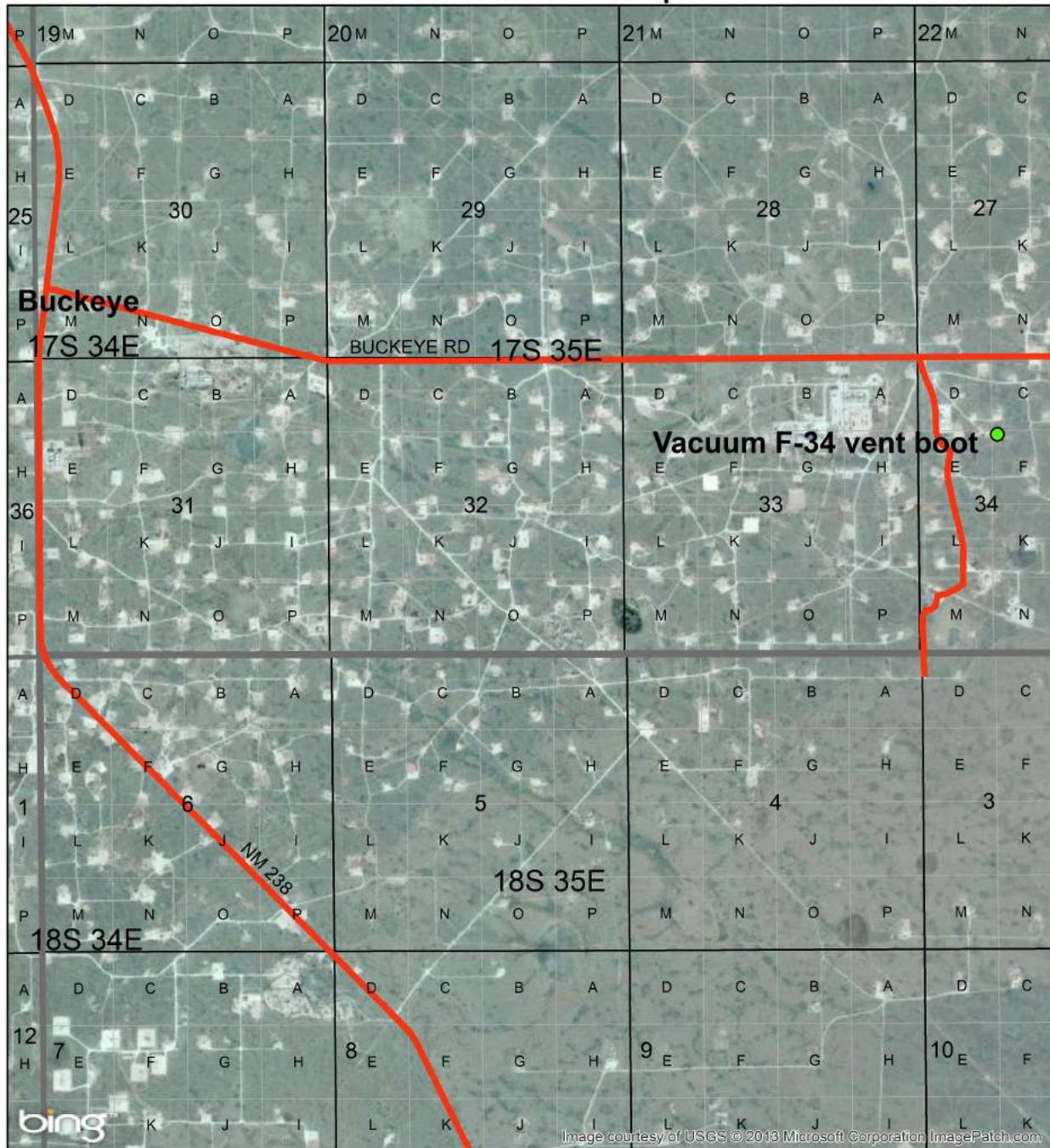


L. Peter Galusky, Jr. P.E.
NM Prof. Engineer No. 22561

Attachments: Appendix w/ Figures and Tables as indicated

Figure 1

Site Location Map



**Vacuum F-34
vent boot**

Legals: UL/F sec. 34
T17S R35E
NMOCD Case #: 1R425-67

0 0.45 0.9 Miles

Drawing date: 6/25/13
Drawn by: L. Weinheimer

Figure 2

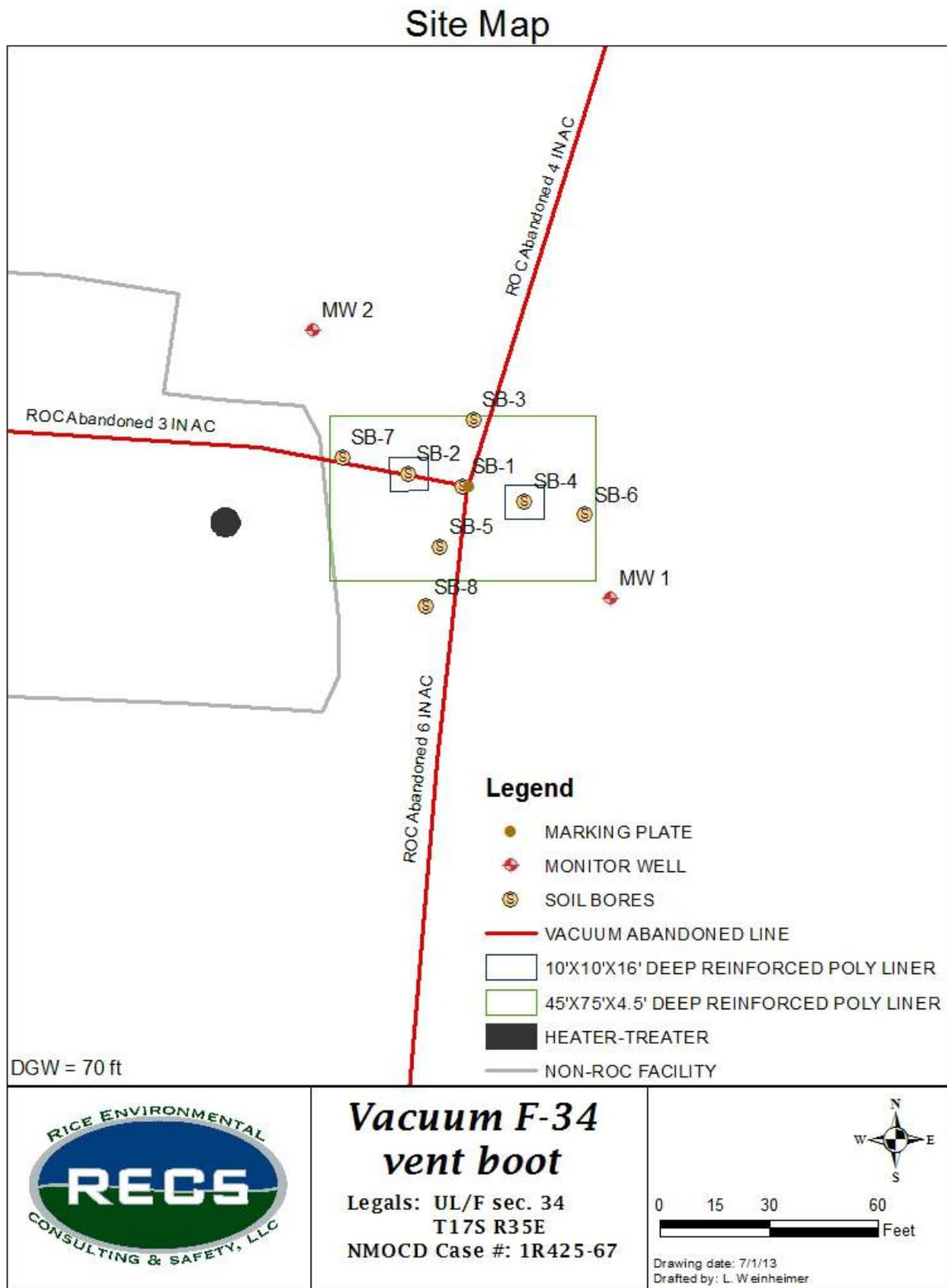


Figure 3

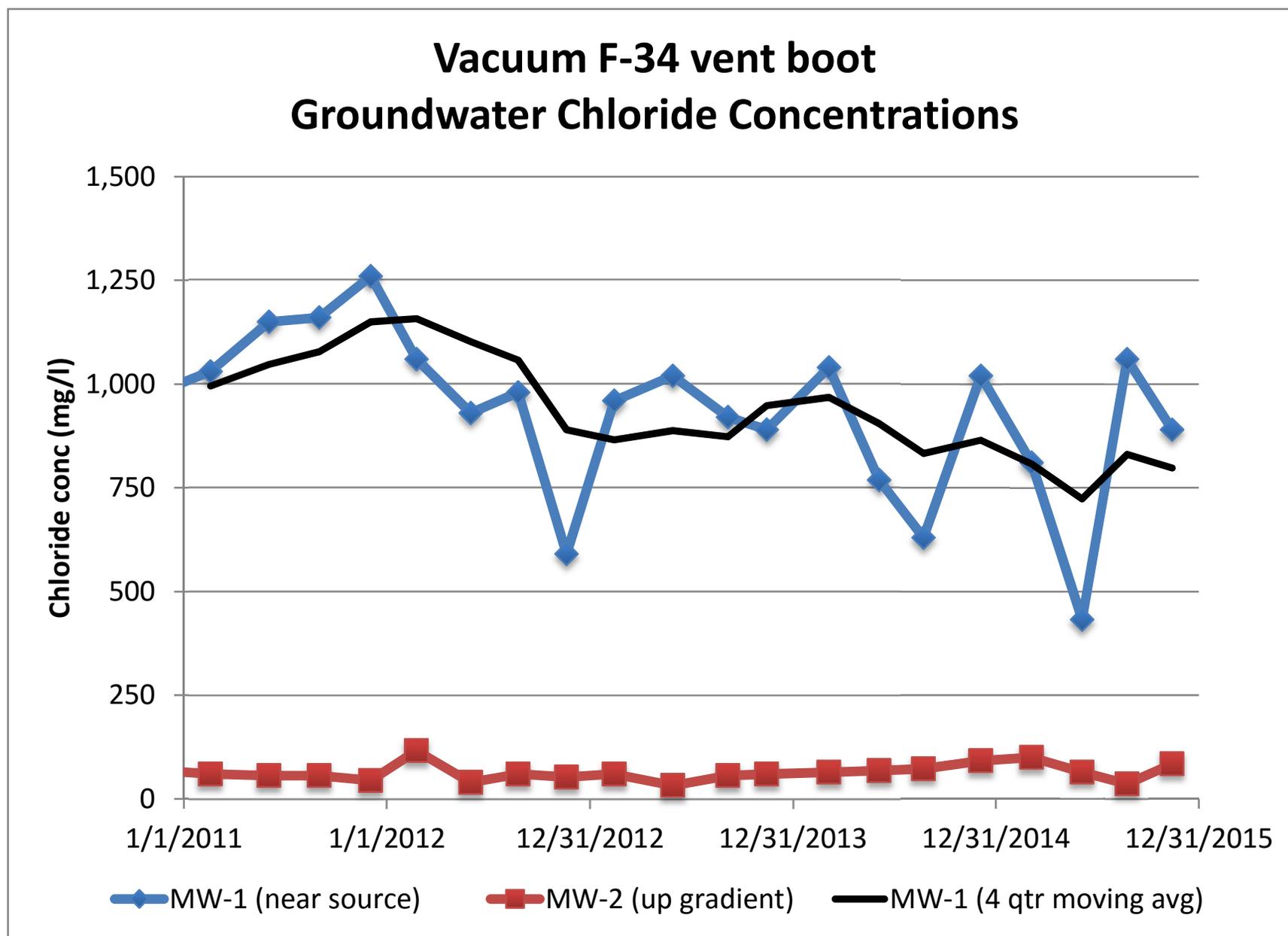


Table 1

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
1	69.9	118.4	5/28/2010	940	2,030	<0.001	<0.001	<0.001	<0.003	91
1	69.7	118.4	7/27/2010	1,040	2,130	<0.001	<0.001	<0.001	<0.003	99
1	69.8	118.4	10/27/2010	970	2,300	<0.001	<0.001	<0.001	<0.003	95
1	69.9	118.4	2/18/2011	1,030	2,010	<0.001	<0.001	<0.001	<0.003	86
1	70.1	118.4	6/3/2011	1,150	2,160	<0.001	<0.001	<0.001	<0.003	90
1	70.1	118.4	9/1/2011	1,160	2,380	<0.001	<0.001	<0.001	<0.003	87
1	70.1	118.4	12/3/2011	1,260	2,470	<0.001	<0.001	<0.001	<0.003	87
1	70.2	118.4	2/23/2012	1,060	2,360	<0.001	<0.001	<0.001	<0.003	98
1	70.3	118.4	5/31/2012	930	2,130	<0.001	<0.001	<0.001	<0.003	81
1	70.0	118.4	8/24/2012	980	2,060	<0.001	<0.001	<0.001	<0.003	81
1	70.1	118.4	11/19/2012	590	1,320	<0.001	<0.001	<0.001	<0.003	78
1	70.2	118.4	2/13/2013	960	1,990	<0.001	<0.001	<0.001	<0.003	76
1	70.6	118.4	5/29/2013	1,020	2,320	<0.001	<0.001	<0.001	<0.003	71
1	70.8	118.4	9/5/2013	920	2,150	<0.001	<0.001	<0.001	<0.003	289
1	XXX	118.4	11/14/2013	890	2,040	<0.001	<0.001	<0.001	<0.003	60
1	XXX	118.4	3/6/2014	1,040	2,080	<0.001	<0.001	<0.001	<0.003	55
1	XXX	118.4	6/4/2014	769	1,490	<0.001	<0.001	<0.001	<0.003	82
1	XXX	118.4	8/23/2014	630	1,570	<0.001	<0.001	<0.001	<0.003	80
1	XXX	118.4	12/4/2014	1,020	2,170	<0.001	<0.001	<0.001	<0.003	78
1	XXX	118.4	3/5/2015	810	1,850	<0.001	<0.001	<0.001	<0.003	53
1	XXX	118.4	6/4/2015	432	1,140	<0.001	<0.001	<0.001	<0.003	66
1	70.6	118.4	8/24/2015	1060	1950	<0.001	<0.001	<0.001	<0.003	35
1	XXX	118.4	11/13/2015	890	1770	<0.001	<0.001	<0.001	<0.003	32

Table 2

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
2	70.5	84.2	11/22/2010	68	340	<0.001	<0.001	<0.001	<0.003	72
2	70.6	84.3	2/18/2011	60	403	<0.001	<0.001	<0.001	<0.003	51
2	70.7	84.3	6/3/2011	56	384	<0.001	<0.001	<0.001	<0.003	57
2	70.7	84.3	9/1/2011	56	407	<0.001	<0.001	<0.001	<0.003	59
2	70.8	84.3	12/3/2011	44	350	<0.001	<0.001	<0.001	<0.003	54
2	70.9	84.3	2/23/2012	116	448	<0.001	<0.001	<0.001	<0.003	62
2	70.9	84.3	5/31/2012	40	422	<0.001	<0.001	<0.001	<0.003	64
2	71.1	84.3	8/24/2012	60	399	<0.001	<0.001	<0.001	<0.003	51
2	71.2	84.3	11/19/2012	52	398	<0.001	<0.001	<0.001	<0.003	48
2	71.4	84.3	2/13/2013	60	380	<0.001	<0.001	<0.001	<0.003	55
2	71.7	84.3	5/29/2013	32	595	<0.001	<0.001	<0.001	<0.003	43
2	71.9	84.3	9/5/2013	56	419	<0.001	<0.001	<0.001	<0.003	54
2	71.8	84.3	11/14/2013	60	419	<0.001	<0.001	<0.001	<0.003	57
2	71.9	84.3	3/6/2014	64	292	<0.001	<0.001	<0.001	<0.003	57
2	71.8	84.3	6/4/2014	68	406	<0.001	<0.001	<0.001	<0.003	54
2	71.9	84.3	8/23/2014	72	414	<0.001	<0.001	<0.001	<0.003	50
2	71.1	84.3	12/4/2014	92	456	<0.001	<0.001	<0.001	<0.003	41
2	71.1	84.3	3/5/2015	100	500	<0.001	<0.001	<0.001	<0.003	44
2	71.2	84.3	6/4/2015	64	446	<0.001	<0.001	<0.001	<0.003	48
2	71.7	84.3	8/24/2015	36	470	<0.001	<0.001	<0.001	<0.003	39
2	71.9	84.3	11/13/2015	84	346	<0.001	<0.001	<0.001	<0.003	62



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

November 23, 2015

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM F-34 VENT

Enclosed are the results of analyses for samples received by the laboratory on 11/16/15 15:31.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited 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.

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,

A handwritten signature in black ink that reads "Hope S. Moreno". The signature is written in a cursive, flowing style.

Hope S. Moreno For Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

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

Received:	11/16/2015	Sampling Date:	11/13/2015
Reported:	11/23/2015	Sampling Type:	Water
Project Name:	VACUUM F-34 VENT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC34 F - LEA CTY, NM		

Sample ID: MONITOR WELL #1 (H503027-01)

BTEX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	11/17/2015	ND	0.020	100	0.0200	0.134	
Toluene*	<0.001	0.001	11/17/2015	ND	0.021	105	0.0200	1.34	
Ethylbenzene*	<0.001	0.001	11/17/2015	ND	0.019	95.9	0.0200	0.442	
Total Xylenes*	<0.003	0.003	11/17/2015	ND	0.062	103	0.0600	0.0650	
Total BTEX	<0.006	0.006	11/17/2015	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.4 % 73.7-146

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	890	4.00	11/18/2015	ND	96.0	96.0	100	15.4	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	32.4	10.0	11/19/2015	ND	18.2	91.0	20.0	5.45	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	1770	5.00	11/18/2015	ND	478	90.7	527	7.36	

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*=Accredited Analyte

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Hope S. Moreno For Celey D. Keene, Lab Director/Quality Manager

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Received:	11/16/2015	Sampling Date:	11/13/2015
Reported:	11/23/2015	Sampling Type:	Water
Project Name:	VACUUM F-34 VENT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC34 F - LEA CTY, NM		

Sample ID: MONITOR WELL #2 (H503027-02)

BTEX 8021B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	11/17/2015	ND	0.020	100	0.0200	0.134		
Toluene*	<0.001	0.001	11/17/2015	ND	0.021	105	0.0200	1.34		
Ethylbenzene*	<0.001	0.001	11/17/2015	ND	0.019	95.9	0.0200	0.442		
Total Xylenes*	<0.003	0.003	11/17/2015	ND	0.062	103	0.0600	0.0650		
Total BTEX	<0.006	0.006	11/17/2015	ND						

Surrogate: 4-Bromofluorobenzene (PID) 101 % 73.7-146

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	84.0	4.00	11/18/2015	ND	96.0	96.0	100	15.4		

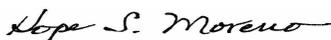
Sulfate 375.4		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	61.7	10.0	11/19/2015	ND	18.2	91.0	20.0	5.45		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	346	5.00	11/18/2015	ND	478	90.7	527	7.36		

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*=Accredited Analyte

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Hope S. Moreno For Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

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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Hope S. Moreno For Celey D. Keene, Lab Director/Quality Manager

