

**L. Peter Galusky, Jr. P.E.**

**Texerra LLC**

**20055 Laredo Lane Monument, Colorado 80132**

**Tel: 719-339-6791 E-mail: lpg@texerra.com**

March 19<sup>th</sup>, 2015

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: **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 was removed during the Vacuum SWD System abandonment. A Junction Box Disclosure Report was submitted to NMOCD in 2009. Texerra submitted an Investigation and Characterization Plan (ICP) to NMOCD on October 5<sup>th</sup>, 2009 and approved by NMOCD on January 28<sup>th</sup>, 2010. Soil samples taken at and near the former boot location indicated elevated soil chloride levels at depth. Groundwater samples taken from a near-source monitor well (MW-1; Appendix, Figures 2 & 3, Table 1) tested 940 mg/l and 1,040 mg/l Cl- on May 28<sup>th</sup> and July 27<sup>th</sup>, 2010, respectively, whereas dissolved hydrocarbons (as BTEX) were not detected in either sampling event. Texerra submitted a Notification of Groundwater Impact to NMOCD on October 26<sup>th</sup>, 2010. ROC subsequently installed and began sampling an up-gradient monitor well (MW-2; Appendix, Figure 2).

ROC installed a double synthetic subsurface soil liner and completed surface restoration in 2013 as proposed in the previously submitted (October 26<sup>th</sup>, 2010) Notification of Groundwater Impact, proposed liner dimensions submitted November 3<sup>rd</sup>, 2010, and Addendum submitted December 22<sup>nd</sup>, 2010 (Appendix, Figure 2). NMOCD subsequently granted remediation termination status or 'soil closure,' on September 15<sup>th</sup>, 2011, with respect to the vadose zone

## VAC F-34 Vent Boot

indicating that groundwater monitoring must be continued and that a groundwater restoration remedy must subsequently be proposed if the data warranted this.

A Project Update was submitted to the NMOCD on August 8, 2013, and proposed continued groundwater monitoring and limited groundwater withdrawal from the near-source well (MW-1) to determine if this might be an effective way of reducing groundwater chloride mass. NMOCD approved that report on August 13, 2013.

### *Past Year and Current Status*

ROC continued to sample groundwater from the near-source (MW-1) and up-gradient (MW-2) monitor wells, analyzing these for chlorides and BTEX (Figure 3, Table 1). Chlorides in the up-gradient well have generally remained below 100 mg/l from the fourth quarter of 2010 through 2014, but have oscillated around a median value of approximately 900 mg/l in the near-source well without exhibiting any clear trend. BTEX has remained below detection in both wells throughout the sampling period.

ROC began groundwater recovery from MW-1 in April of 2014. A total of 4,077 bbls of groundwater and 305 kg of chloride have been removed through November, when the system was shut down for winter. Groundwater withdrawals will resume in the spring of 2015 and continue until freezing weather begins in the fall. We will then analyze the data and see if two years of pumping have a demonstrable effect on groundwater chloride concentrations. It should be noted that the removed groundwater is used for line 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.

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 Table as indicated

**Figure 1**

## Site Location Map

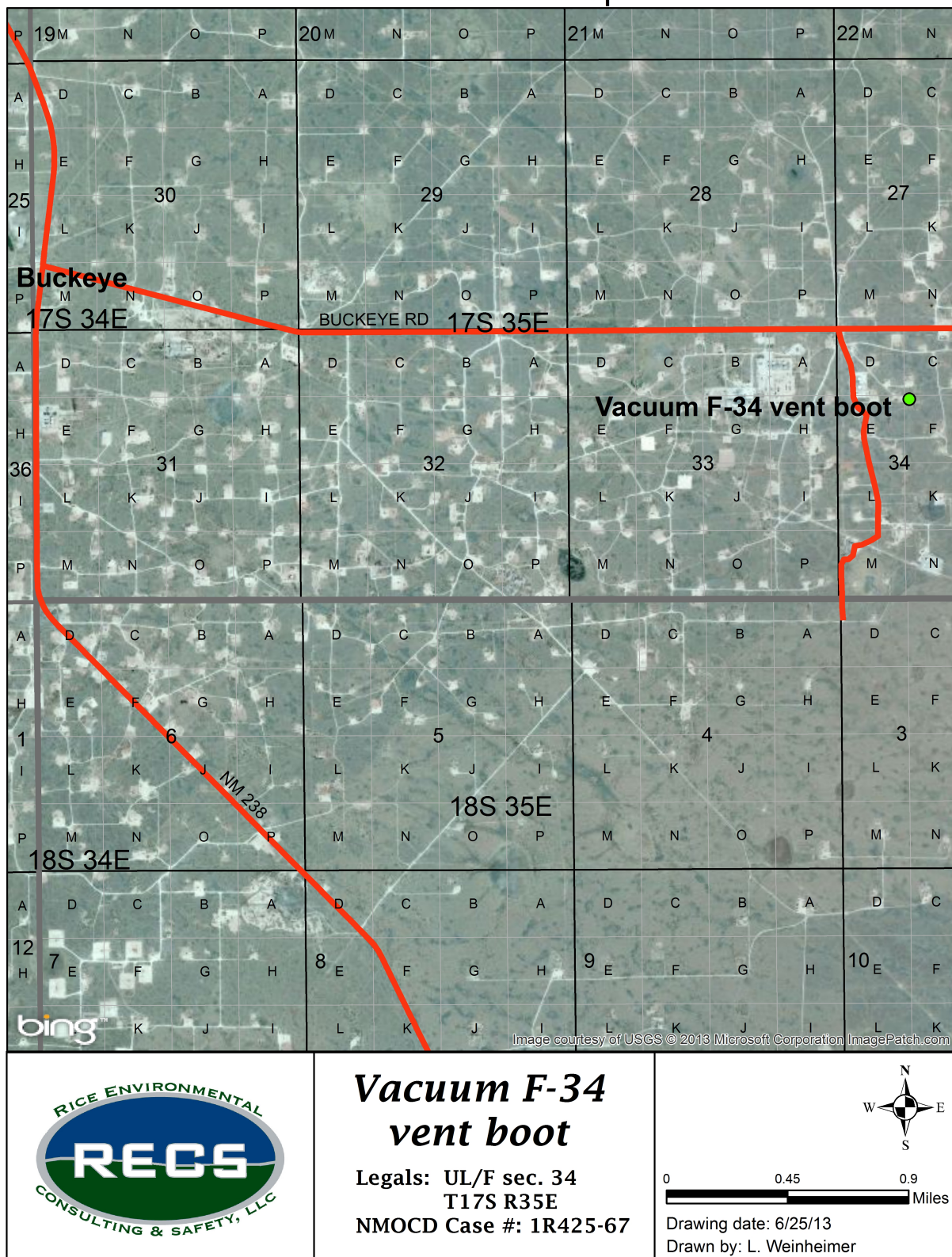


Figure 2

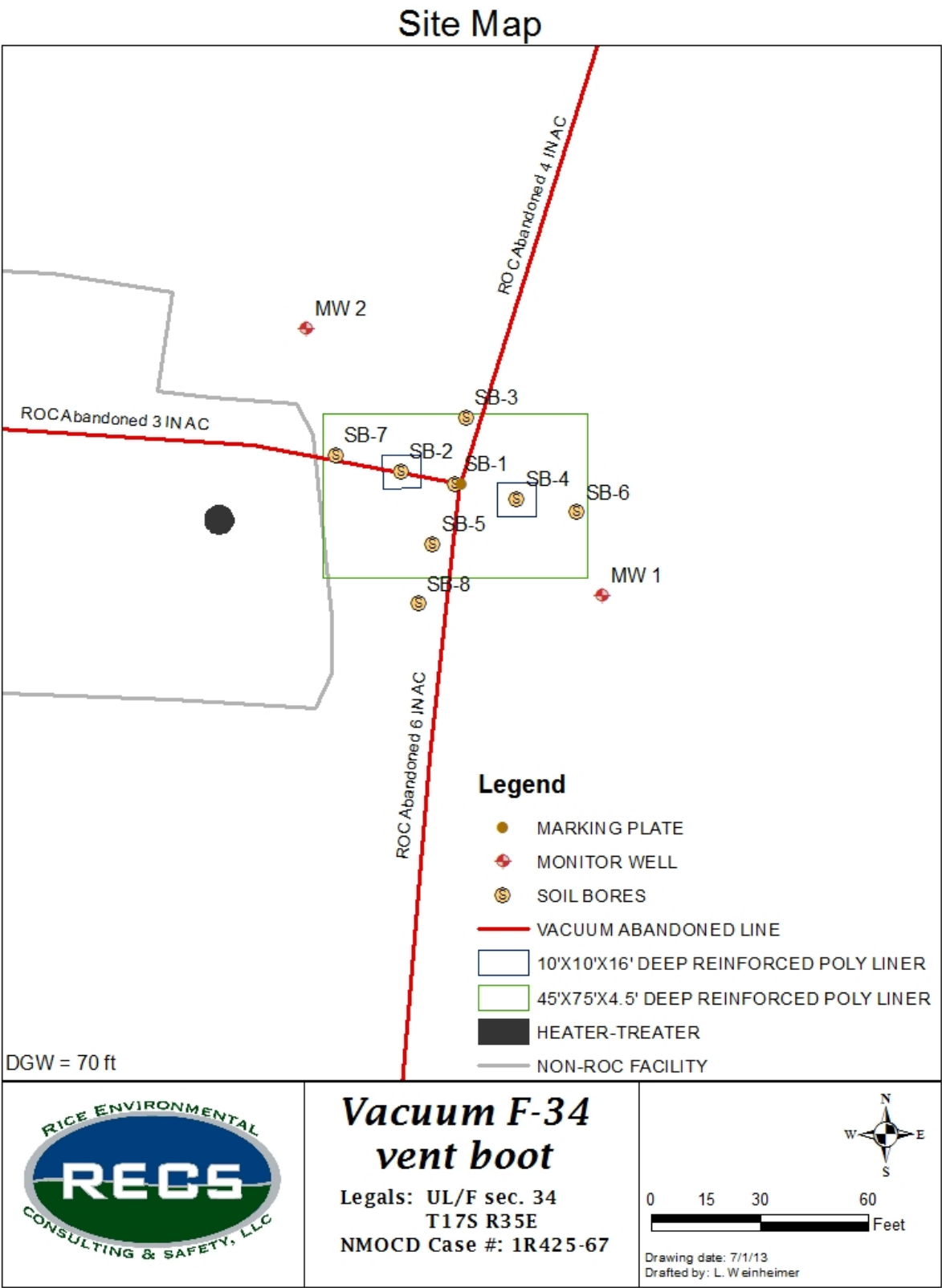
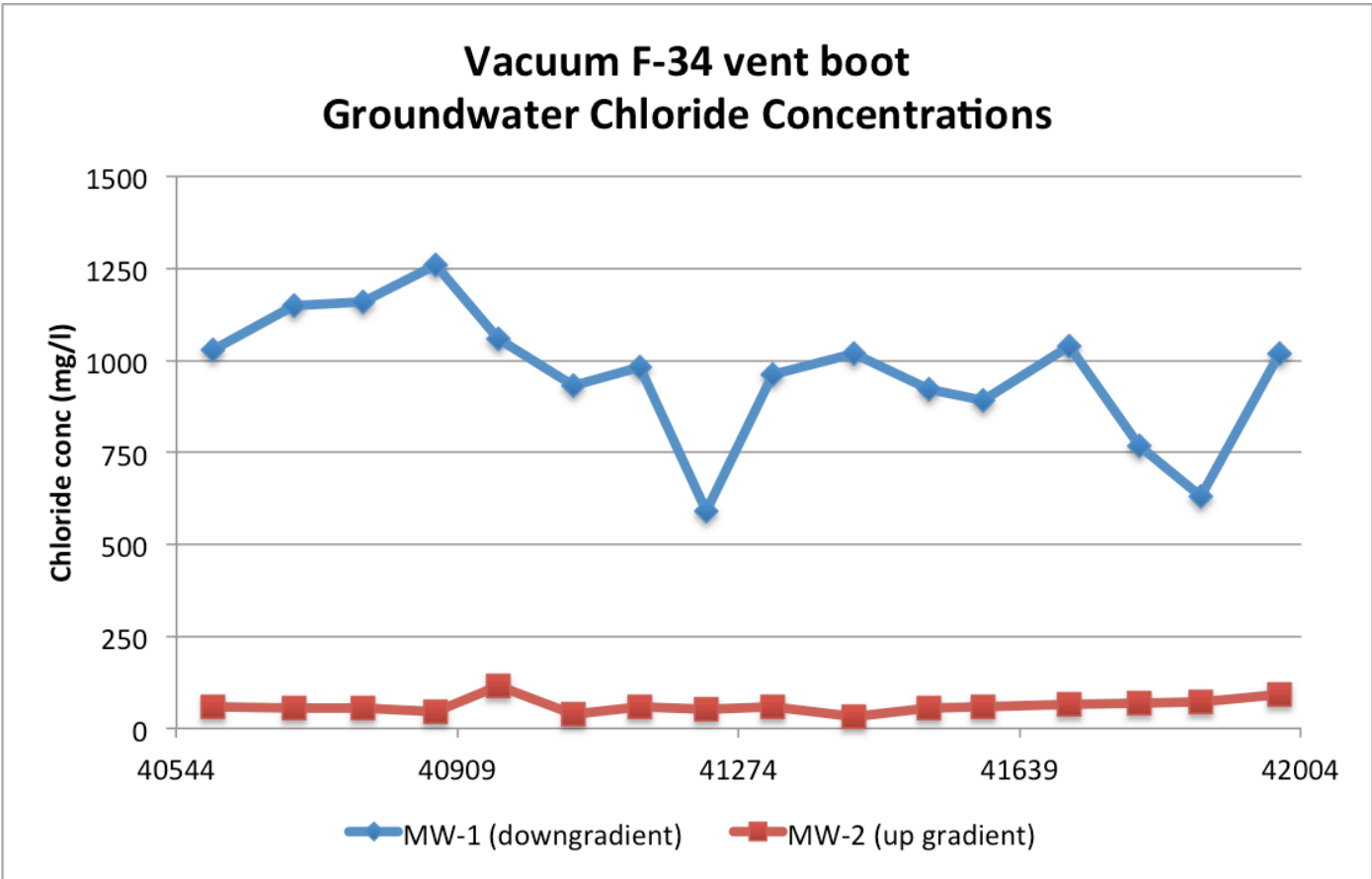


Figure 3



**Table 1****ROC - Vacuum F-34 vent boot (1R425-67)****Groundwater Analyses**

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
1	69.91	118.36	5/28/10	940	2,030	<0.001	<0.001	<0.001	<0.003	91
1	69.74	118.36	7/27/10	1,040	2,130	<0.001	<0.001	<0.001	<0.003	99.1
1	69.75	118.36	10/27/10	970	2,300	<0.001	<0.001	<0.001	<0.003	94.9
1	69.87	118.36	2/18/11	1,030	2,010	<0.001	<0.001	<0.001	<0.003	85.6
1	70.06	118.36	6/3/11	1,150	2,160	<0.001	<0.001	<0.001	<0.003	89.7
1	70.08	118.36	9/1/11	1,160	2,380	<0.001	<0.001	<0.001	<0.003	87.3
1	70.09	118.36	12/3/11	1,260	2,470	<0.001	<0.001	<0.001	<0.003	86.6
1	70.22	118.36	2/23/12	1,060	2,360	<0.001	<0.001	<0.001	<0.003	98.4
1	70.26	118.36	5/31/12	930	2,130	<0.001	<0.001	<0.001	<0.003	81.2
1	70.02	118.36	8/24/12	980	2,060	<0.001	<0.001	<0.001	<0.003	80.8
1	70.06	118.36	11/19/12	590	1,320	<0.001	<0.001	<0.001	<0.003	77.7
1	70.24	118.36	2/13/13	960	1,990	<0.001	<0.001	<0.001	<0.003	76
1	70.56	118.36	5/29/13	1,020	2,320	<0.001	<0.001	<0.001	<0.003	71
1	70.83	118.36	9/5/13	920	2,150	<0.001	<0.001	<0.001	<0.003	289
1	XXX	118.36	11/14/13	890	2,040	<0.001	<0.001	<0.001	<0.003	59.7
1	XXX	118.36	3/6/14	1,040	2,080	<0.001	<0.001	<0.001	<0.003	55.2
1	XXX	118.36	6/4/14	769	1,490	<0.001	<0.001	<0.001	<0.003	82
1	XXX	118.36	8/23/14	630	1,570	<0.001	<0.001	<0.001	<0.003	80
1	XXX	118.36	12/4/14	1,020	2,170	<0.001	<0.001	<0.001	<0.003	78.3

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
2	70.48	84.22	11/22/10	68	340	<0.001	<0.001	<0.001	<0.003	71.7
2	70.57	84.32	2/18/11	60	403	<0.001	<0.001	<0.001	<0.003	50.5
2	70.72	84.32	6/3/11	56	384	<0.001	<0.001	<0.001	<0.003	56.9
2	70.73	84.32	9/1/11	56	407	<0.001	<0.001	<0.001	<0.003	58.6
2	70.75	84.32	12/3/11	44	350	<0.001	<0.001	<0.001	<0.003	54.1
2	70.89	84.32	2/23/12	116	448	<0.001	<0.001	<0.001	<0.003	61.8
2	70.94	84.32	5/31/12	40	422	<0.001	<0.001	<0.001	<0.003	64
2	71.12	84.32	8/24/12	60	399	<0.001	<0.001	<0.001	<0.003	50.8
2	71.18	84.32	11/19/12	52	398	<0.001	<0.001	<0.001	<0.003	47.6
2	71.37	84.32	2/13/13	60	380	<0.001	<0.001	<0.001	<0.003	54.5
2	71.71	84.32	5/29/13	32	595	<0.001	<0.001	<0.001	<0.003	43
2	71.88	84.32	9/5/13	56	419	<0.001	<0.001	<0.001	<0.003	53.7
2	71.84	84.32	11/14/13	60	419	<0.001	<0.001	<0.001	<0.003	56.8
2	71.92	84.32	3/6/14	64	292	<0.001	<0.001	<0.001	<0.003	56.6
2	71.82	84.32	6/4/14	68	406	<0.001	<0.001	<0.001	<0.003	54.4
2	71.85	84.32	8/23/14	72	414	<0.001	<0.001	<0.001	<0.003	49.7
2	71.11	84.32	12/4/14	92	456	<0.001	<0.001	<0.001	<0.003	41.2

December 15, 2014

Hack Conder

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 12/09/14 16:04.

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](http://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,



Celey D. Keene

Lab Director/Quality Manager



**Analytical Results For:**

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

Received:	12/09/2014	Sampling Date:	12/04/2014
Reported:	12/15/2014	Sampling Type:	Water
Project Name:	VACUUM F-34 VENT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Kathy Perez
Project Location:	T17S-R35E-SEC34 F - LEA CTY, NM		

**Sample ID: MONITOR WELL #1 (H403761-01)**

BTEx 8021B		mg/L		Analyzed By: CK						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	12/12/2014	ND	0.018	90.5	0.0200	3.42		
Toluene*	<0.001	0.001	12/12/2014	ND	0.019	96.2	0.0200	4.04		
Ethylbenzene*	<0.001	0.001	12/12/2014	ND	0.019	96.2	0.0200	3.92		
Total Xylenes*	<0.003	0.003	12/12/2014	ND	0.057	95.2	0.0600	3.57		
Total BTEX	<0.006	0.006	12/12/2014	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 66.2-142

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	1020	4.00	12/10/2014	ND	104	104	100	0.00		

Sulfate 375.4		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	78.3	10.0	12/11/2014	ND	18.4	92.0	20.0	3.93		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	2170	5.00	12/11/2014	ND	504	95.6	527	0.806		

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

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

Received:	12/09/2014	Sampling Date:	12/04/2014
Reported:	12/15/2014	Sampling Type:	Water
Project Name:	VACUUM F-34 VENT	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Kathy Perez
Project Location:	T17S-R35E-SEC34 F - LEA CTY, NM		

**Sample ID: MONITOR WELL #2 (H403761-02)**

BTEX 8021B		mg/L		Analyzed By: CK						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	12/12/2014	ND	0.018	90.5	0.0200	3.42		
Toluene*	<0.001	0.001	12/12/2014	ND	0.019	96.2	0.0200	4.04		
Ethylbenzene*	<0.001	0.001	12/12/2014	ND	0.019	96.2	0.0200	3.92		
Total Xylenes*	<0.003	0.003	12/12/2014	ND	0.057	95.2	0.0600	3.57		
Total BTEX	<0.006	0.006	12/12/2014	ND						

Surrogate: 4-Bromofluorobenzene (PID) 100 % 66.2-142

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	92.0	4.00	12/10/2014	ND	104	104	100	0.00		

Sulfate 375.4		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	41.2	10.0	12/11/2014	ND	18.4	92.0	20.0	3.93		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	456	5.00	12/11/2014	ND	478	90.7	527	1.32		

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\*=Accredited Analyte

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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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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Cardinal Laboratories, Inc.**

BILL TO	Company:	PO#
RICE Operating Company		
Address:		(Street, City, Zip)
122 W Taylor Street ~ Hobbs, New Mexico 88240		
Phone#:		Fax#:
(575) 393-9174		(575) 397-1471

Address: (Street, City, Zip)  
122 W Taylor Street ~ Hobbs, New Mexico 88240

Phone#:	Fax#:
(575) 393-9174	(575) 397-1471

Fax #:  
(575) 397-1471

Project #: \_\_\_\_\_ Project Name: Vacuum F-34 Vent

Sampler Signature: Rozanne Johnson (575)631-9310

Project Location:  
T17S-R35E-Sec34 F~ Lea County New Mexico

[illegible]

Relinquished by: Rozanne Johnson Date: 12/9/2014 Time: 16:03

Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received By: (Laboratory Staff) Date: Time:

Delivered By: (Circle One)

Sample Condition	CHECKED BY:
------------------	-------------

Sampler - UPS - Bus - Other:

	Cool	Intact
Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>

CHECKED BY:

(Initials) VC

Phone Results	Yes	No
---------------	-----	----

Fax Results	Yes	No
-------------	-----	----

No

No

Additional Fax Number:

REMARKS:

Email Results to: [hconder@riceswd.com](mailto:hconder@riceswd.com)  
[lweinheimer@rice-ecs.com](mailto:lweinheimer@rice-ecs.com)  
[kjones@riceswd.com](mailto:kjones@riceswd.com)  
[rozanne11@windstream.net](mailto:rozanne11@windstream.net)