

**AP-59**

**2013**

**Annual Report**

**DATE**

**March 31, 2014**

**From:** [L. Peter Galusky](#)  
**To:** [Lowe, Leonard, EMNRD](#)  
**Cc:** [VonGonten, Glenn, EMNRD](#); [Katie Jones](#); [Laura Flores](#); [Hack Conder](#)  
**Subject:** Rice Operating Company Annual Report for NMOCD No. AP-59 Vacuum F&G 35 SWDs  
**Date:** Monday, March 31, 2014 10:10:57 AM  
**Attachments:** [Vacuum F-35 and G-35 \(AP-59\) 2013 RY Annual Report 03.31.2014s.pdf](#)

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Mr. Lowe,

Attached is the 2013 Annual Groundwater Report for Vacuum F&G 35 SWDs. Annual Reports are submitted yearly to update the NMOCD about groundwater quality for a particular site. This report does not require NMOCD approval; therefore, a flow chart is not included.

Please contact either myself or Hack Conder of Rice Operating Company if you have any questions or need additional information.

Thank you.

Sincerely,

Pete G.

--

**L. Peter (Pete) Galusky, Jr. P.E.**  
Principal Environmental Engineer

**Texerra LLC**

Cell: 719-339-6791

E-mail: [lpg@texerra.com](mailto:lpg@texerra.com)

Web: [www.texerra.com](http://www.texerra.com)

**L. Peter Galusky, Jr. Ph.D., P.G.**

**Texerra LLC**

20055 Laredo Lane Monument, CO 80132  
Tel: 719-339-6791 E-mail: [lpg@texerra.com](mailto:lpg@texerra.com)

**March 31<sup>st</sup>, 2014**

**Mr. Leonard Lowe**

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

Re: **2013 Annual Report**  
Vacuum F-35 & G-35 SWDs, Sec 35, T17S, R35E  
**OCD Case No. AP-59**

**Mr. Lowe:**

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 the Appendix (Figures 1 & 2, respectively). In brief:

**Vacuum F-35**

- Groundwater chloride concentrations in the at-source monitor well (MW-1) continued their decline from the past several years (Appendix - Figure 3a), dropping to an average of 270 mg/l in 2013 versus an average of 655 mg/l in 2012. There has been no significant change in groundwater chlorides in the down-gradient well, MW-3S (shallow) and MW-3D (deep), averaging 172 mg/l and 38 mg/l, respectively, for 2013 and indicating that the magnitude of up-gradient chloride mass being diluted is apparently small.
- BTEX concentrations in MW-1 (Appendix - Figure 3b) equaled .182 mg/l, which is substantially below their historic high value of 5.941 mg/l measured in March 2005 and indicating that dissolved hydrocarbons appear to be a diminishing concern at this location.

**Vacuum G-35**

- Groundwater chloride concentrations in the at-source monitor well (MW-1) and the down-gradient monitor well (MW-4) continued their decline from the past several years, averaging 68 mg/l and 138 mg/l for 2013 (Appendix - Figure 4a). Chloride concentrations in the down-gradient well MW-3S (shallow) dropped from 715 mg/l in 2012 to 545 mg/l in 2013. Chloride concentrations in the down-gradient well MW-3D (deep) ended the year at 985 mg/l which is essentially unchanged from 990 mg/l in 2012.

## **Rice Operating Company – Vacuum F&G 35 2013 Annual Report**

- Total BTEX concentrations (Appendix - Figure 4b) continued their decline in the at-source well (MW-1), averaging .0570 mg/l in 2013 versus 0.1165 mg/l in 2012. Total BTEX concentrations in the near-source down-gradient well (MW-4) returned to a pattern of decline, averaging 0.3595 in 2013 versus 1.0080 in 2012.

In summary, it appears that chloride is attenuating through dilution of a relatively small original mass and that BTEX is gradually being reduced through natural microbial metabolism.

ROC will continue to monitor groundwater semi-annually (two sampling events) through 2014, paying particular attention to BTEX concentrations in MW-4 at the G-35 location. Upon analysis of this additional data, we will consider if a change in course of action is warranted. As it presently stands, it appears that natural attenuation (dilution) will effectively reduce groundwater chloride concentrations at the affected locations and that the chloride mass is sufficiently small so that down-gradient impacts will be negligible.

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.

We appreciate your consideration of this Annual Report. Please do not hesitate to contact either Rice Operating Company or myself if you have any questions or need additional information.

Sincerely,

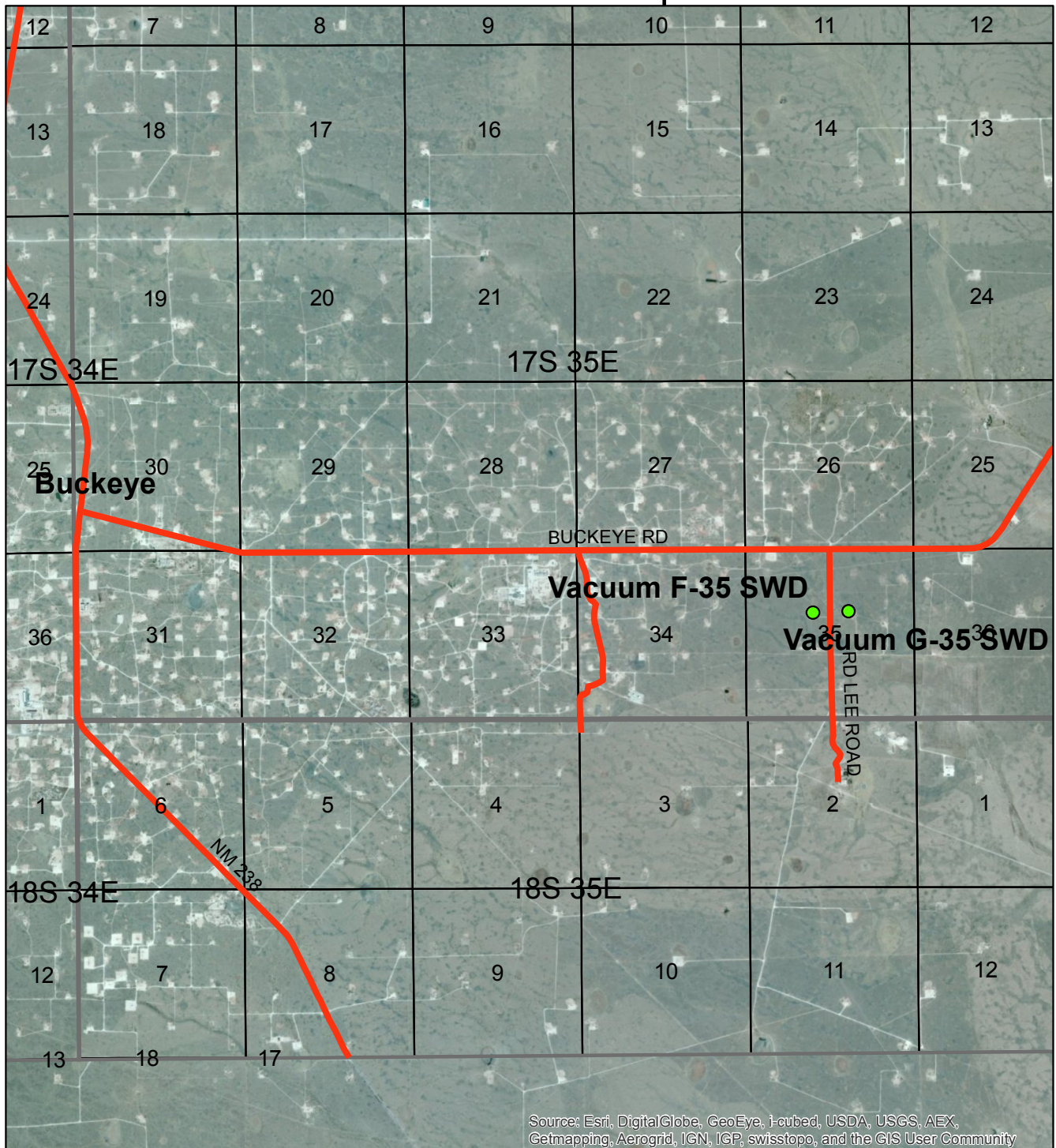
A handwritten signature in black ink, appearing to be 'L. Peter Galusky, Jr.', written over a light gray rectangular background.

L. Peter Galusky, Jr. Ph.D.

Copy: Glenn VonGonten, NMOCD; Rice Operating Company

Attachments: Appendix

# Site Location Map



***Vacuum  
F-35 SWD  
& G-35 SWD***  
 Legals: UL/F, G sec. 35  
 T17S R35E  
 NMOCD Case #: AP-59

**Figure 1**

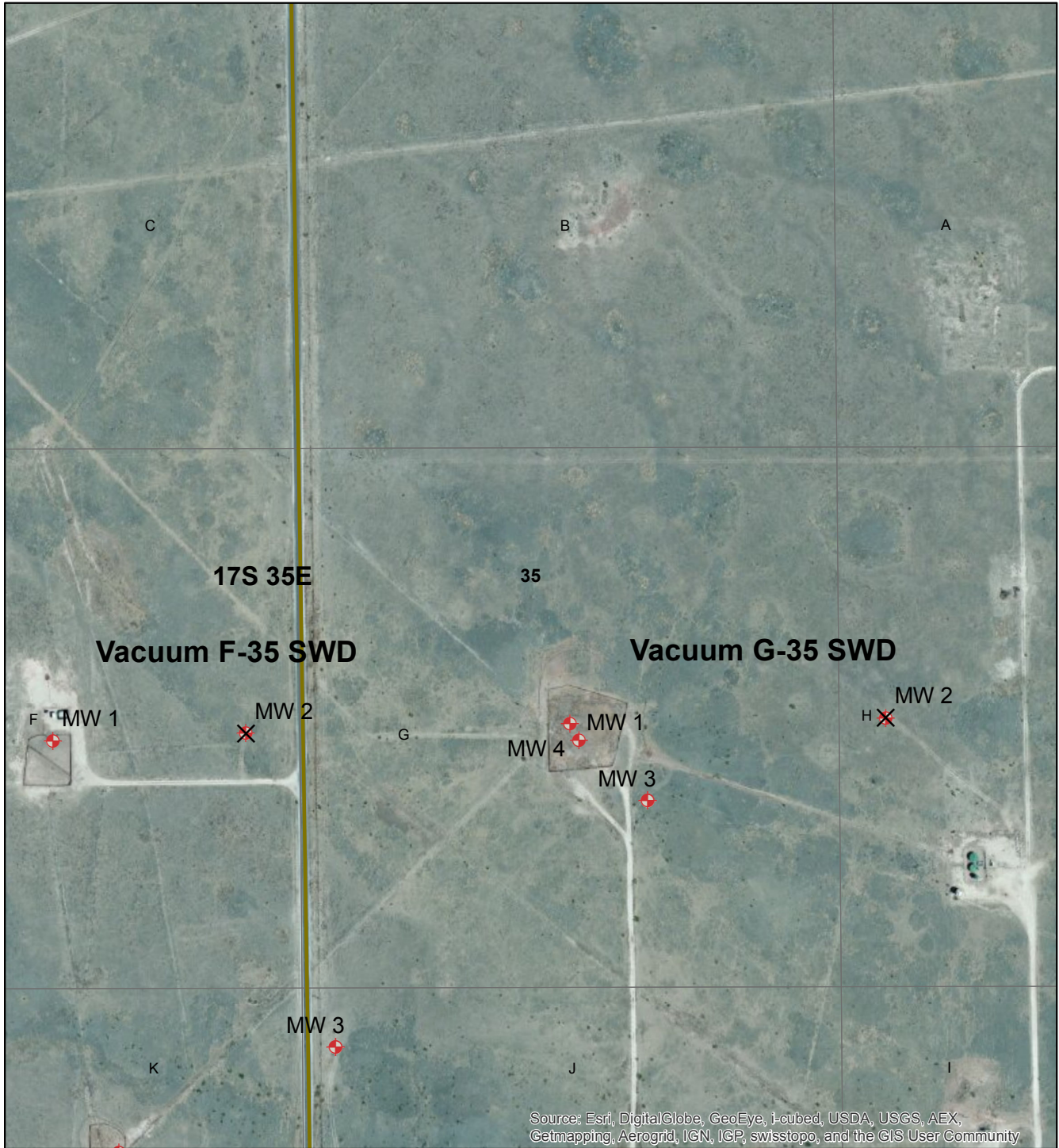


0 0.175 0.35 0.7 1.05 1.4  
 Miles

Drawing date: 3/24/14  
 Drawn by: L. Flores

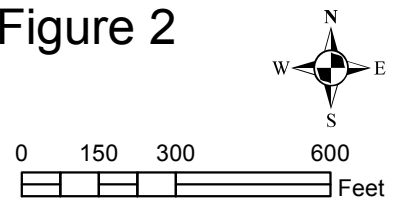


# Monitor Well Locations



***Vacuum  
F-35 SWD  
& G-35 SWD***  
Legals: UL/F, G sec. 35  
T17S R35E  
NMOCD Case #: AP-59

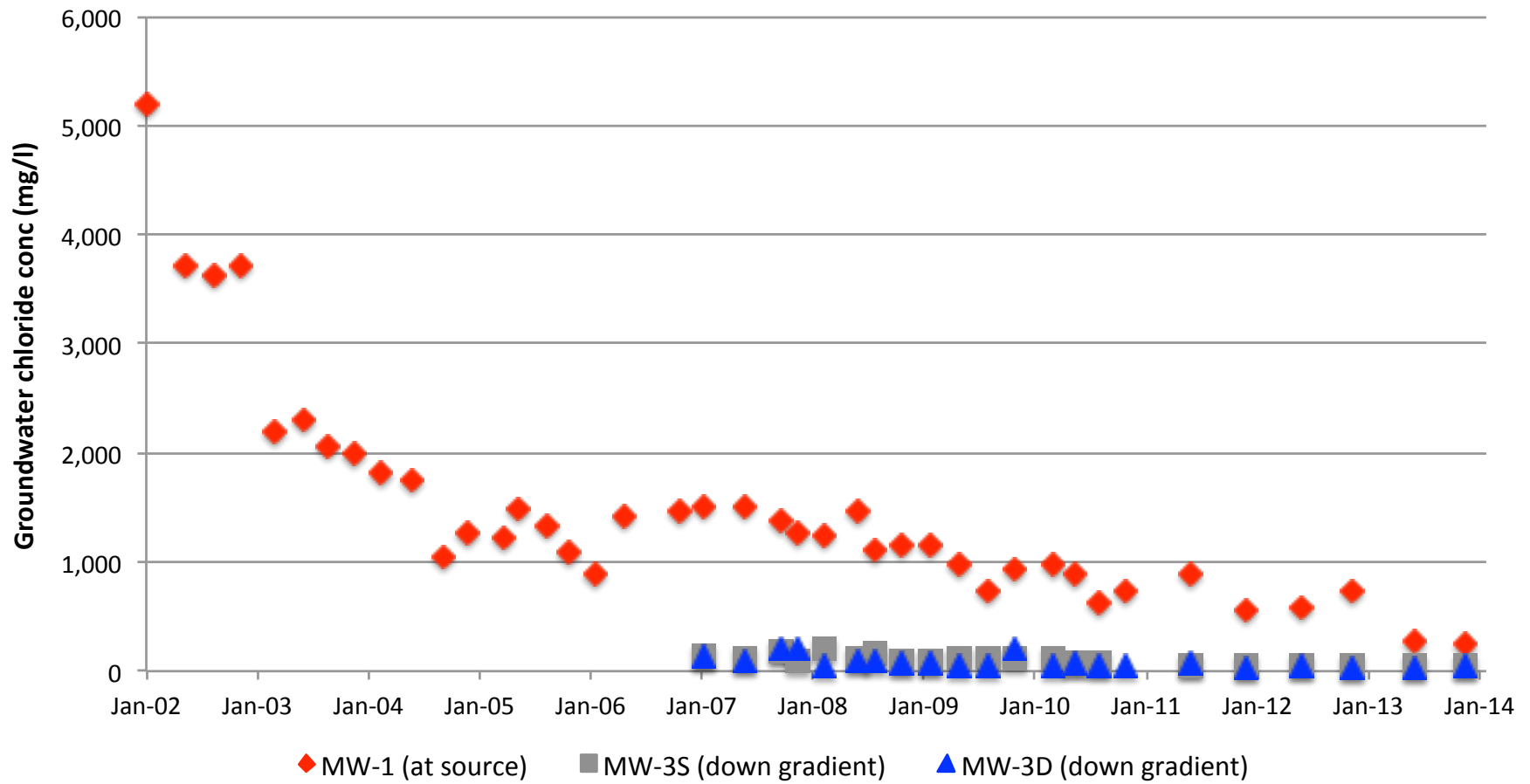
**Figure 2**



Drawing date: 3/24/14  
Drafted by: L. Flores

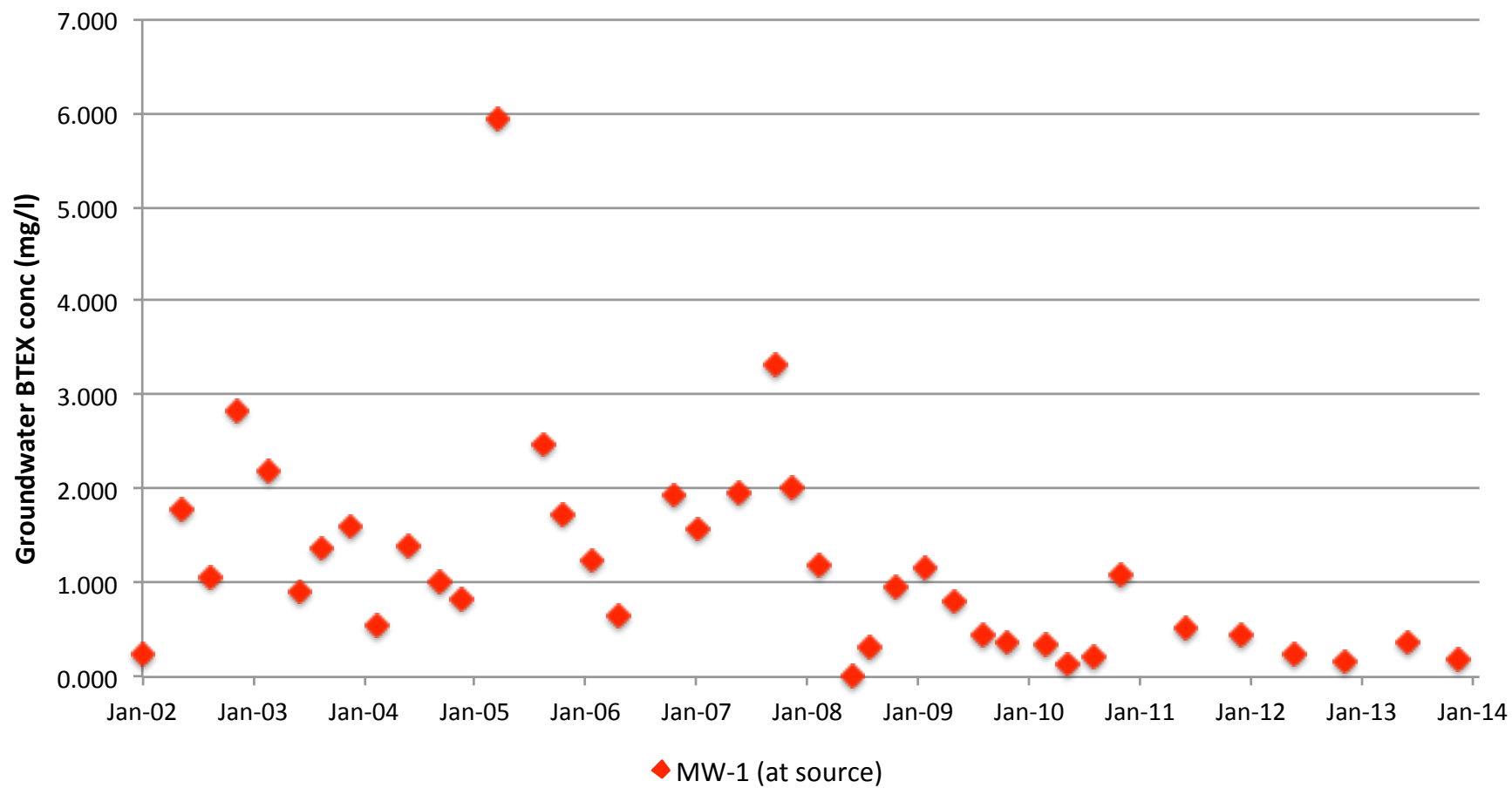
**Figure 3-A**

## VAC F-35 SWD - Groundwater Chlorides



**Figure 3-B**

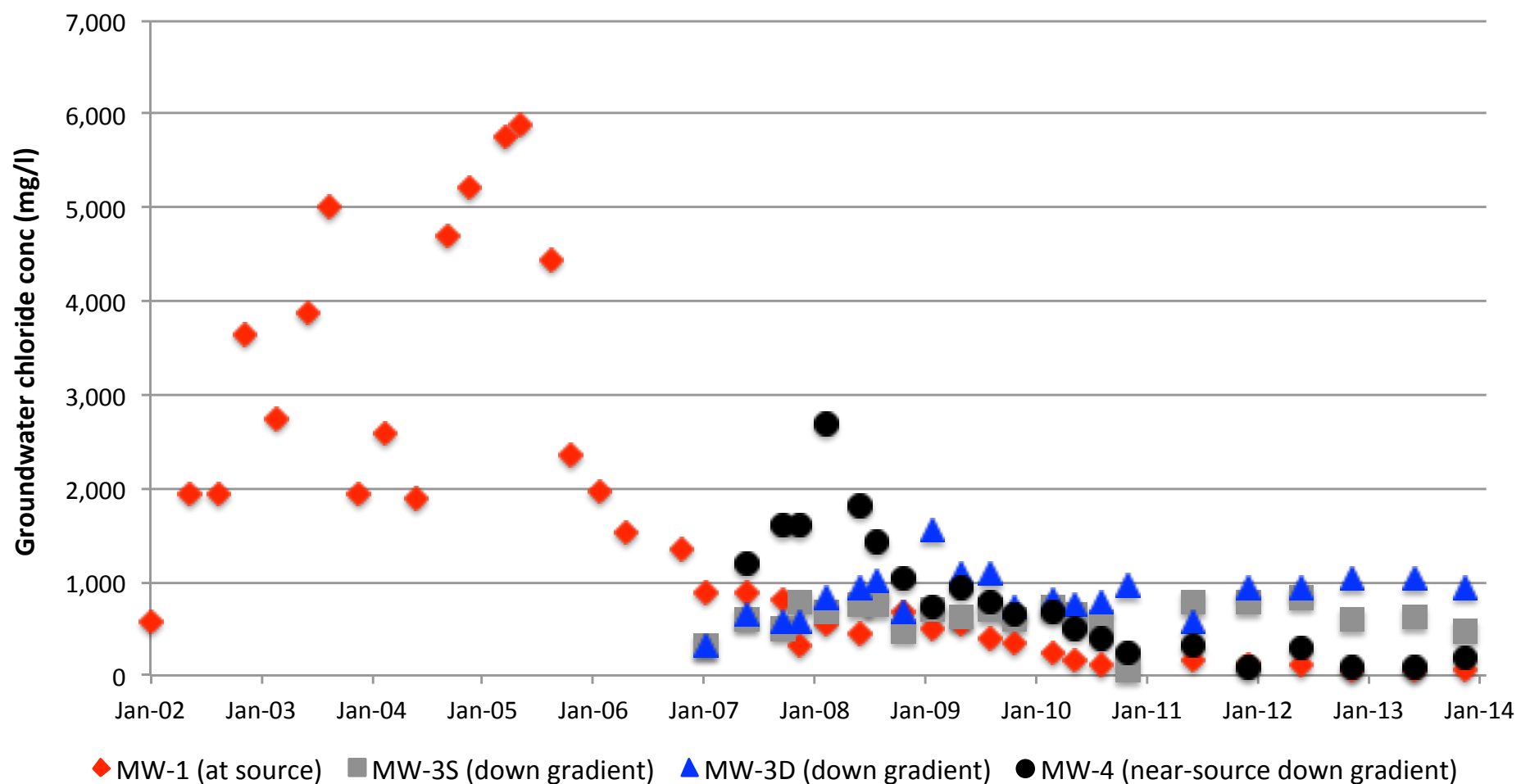
### VAC F-35 SWD - Groundwater BTEX





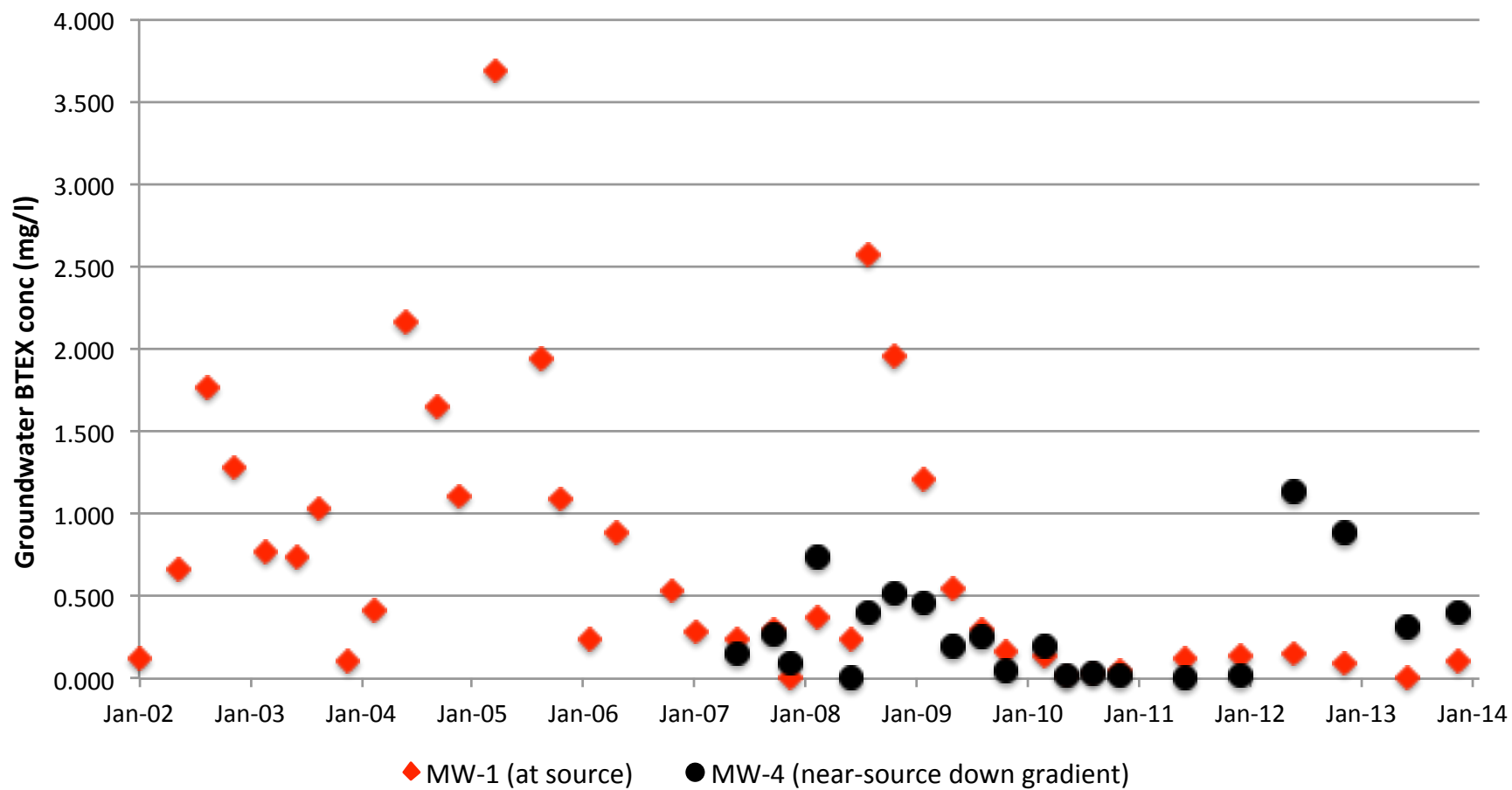
**Figure 4-A**

## VAC G-35 SWD - Groundwater Chlorides



**Figure 4-B**

### VAC G-35 SWD - Groundwater BTEX





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

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November 26, 2013

Hack Conder

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 11/20/13 12:16.

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,

Mike Snyder

Organic Supervisor



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

**Analytical Results For:**

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

Received:	11/20/2013	Sampling Date:	11/18/2013
Reported:	11/26/2013	Sampling Type:	Water
Project Name:	VACUUM F-35 SWD AND G-35 SWD	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC35 F & G -LEA CTY, NM		

**Sample ID: F-35 SWD MONITOR WELL #1 (H302830-01)**

BTEX 8021B		mg/L		Analyzed By: MS				S-04	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.040	0.001	11/24/2013	ND	0.056	113	0.0500	0.721	
Toluene*	0.015	0.001	11/24/2013	ND	0.056	111	0.0500	0.0556	
Ethylbenzene*	0.064	0.001	11/24/2013	ND	0.055	111	0.0500	0.123	
Total Xylenes*	0.063	0.003	11/24/2013	ND	0.163	108	0.150	0.0111	
Total BTEX	0.181	0.006	11/24/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 153 % 89.5-126

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	260	4.00	11/25/2013	ND	100	100	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*	26.2	10.0	11/25/2013	ND	17.8	89.0	20.0	4.72	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	810	5.00	11/25/2013	ND	245			0.0480	

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\*=Accredited Analyte

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Mike Snyder, Organic Supervisor



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**Analytical Results For:**

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

Received:	11/20/2013	Sampling Date:	11/17/2013
Reported:	11/26/2013	Sampling Type:	Water
Project Name:	VACUUM F-35 SWD AND G-35 SWD	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC35 F & G -LEA CTY, NM		

**Sample ID: F-35 SWD MONITOR WELL #3-SHALLOW (H302830-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	52.0	4.00	11/25/2013	ND	100	100	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*	60.5	10.0	11/25/2013	ND	17.8	89.0	20.0	4.72	
TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	380	5.00	11/25/2013	ND	245			0.0480	

**Sample ID: F-35 SWD MONITOR WELL #3-DEEP (H302830-03)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	44.0	4.00	11/25/2013	ND	100	100	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*	60.3	10.0	11/25/2013	ND	17.8	89.0	20.0	4.72	
TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	343	5.00	11/25/2013	ND	245			0.0480	

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Mike Snyder, Organic Supervisor





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**Analytical Results For:**

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

Received:	11/20/2013	Sampling Date:	11/18/2013
Reported:	11/26/2013	Sampling Type:	Water
Project Name:	VACUUM F-35 SWD AND G-35 SWD	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC35 F & G -LEA CTY, NM		

**Sample ID: G-35 SWD MONITOR WELL #1 (H302830-04)**

BTEX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.022	0.001	11/24/2013	ND	0.056	113	0.0500	0.721	
Toluene*	0.002	0.001	11/24/2013	ND	0.056	111	0.0500	0.0556	
Ethylbenzene*	0.080	0.001	11/24/2013	ND	0.055	111	0.0500	0.123	
Total Xylenes*	0.007	0.003	11/24/2013	ND	0.163	108	0.150	0.0111	
Total BTEX	0.112	0.006	11/24/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 109 % 89.5-126

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	64.0	4.00	11/25/2013	ND	100	100	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*	40.1	10.0	11/25/2013	ND	17.8	89.0	20.0	4.72	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	425	5.00	11/25/2013	ND	245			0.0480	

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Mike Snyder, Organic Supervisor

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

Received:	11/20/2013	Sampling Date:	11/17/2013
Reported:	11/26/2013	Sampling Type:	Water
Project Name:	VACUUM F-35 SWD AND G-35 SWD	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC35 F & G -LEA CTY, NM		

**Sample ID: G-35 SWD MONITOR WELL #3 - SHALLOW (H302830-05)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride*</b>	<b>460</b>	4.00	11/25/2013	ND	100	100	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
<b>Sulfate*</b>	<b>35.9</b>	10.0	11/25/2013	ND	17.8	89.0	20.0	4.72	
TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>TDS*</b>	<b>1200</b>	5.00	11/25/2013	ND	245			0.0480	

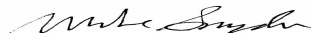
**Sample ID: G-35 SWD MONITOR WELL #3-DEEP (H302830-06)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride*</b>	<b>930</b>	4.00	11/25/2013	ND	100	100	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
<b>Sulfate*</b>	<b>29.0</b>	10.0	11/25/2013	ND	17.8	89.0	20.0	4.72	
TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>TDS*</b>	<b>2090</b>	5.00	11/25/2013	ND	245			0.0480	

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Mike Snyder, Organic Supervisor



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**Analytical Results For:**

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

Received:	11/20/2013	Sampling Date:	11/18/2013
Reported:	11/26/2013	Sampling Type:	Water
Project Name:	VACUUM F-35 SWD AND G-35 SWD	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T17S-R35E-SEC35 F & G -LEA CTY, NM		

**Sample ID: G-35 SWD MONITOR WELL #4 (H302830-07)**

BTEX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.118	0.001	11/24/2013	ND	0.056	113	0.0500	0.721	
Toluene*	0.050	0.001	11/24/2013	ND	0.056	111	0.0500	0.0556	
Ethylbenzene*	0.195	0.001	11/24/2013	ND	0.055	111	0.0500	0.123	
Total Xylenes*	0.043	0.003	11/24/2013	ND	0.163	108	0.150	0.0111	
Total BTEX	0.407	0.006	11/24/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIL) 105 % 89.5-126

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	180	4.00	11/25/2013	ND	100	100	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*	23.3	10.0	11/25/2013	ND	17.8	89.0	20.0	4.72	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	590	5.00	11/25/2013	ND	245			0.0480	

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\*=Accredited Analyte

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Mike Snyder, Organic Supervisor

### Notes and Definitions

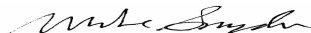
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	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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---

Mike Snyder, Organic Supervisor

101 East Marland - Hobbs, New Mexico  
88240 Tel  
(575) 393-2326 Fax  
(575) 393-2476

# Cardinal Laboratories, Inc.

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # \_\_\_\_\_

### ANALYSIS REQUEST

(Circle or Specify Method No.)

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

Project #: \_\_\_\_\_ Project Name: **Vacuum F-35 SWD and G-35 SWD**

Project Location: **T17S-R35E-Sec35 F and G ~ Lea County - New Mexico** Sampler Signature: **Rozanne Johnson (575) 631-9310**  
**rozanne@valornet.com**

LAB #	FIELD CODE	(G)rab or (Q)ump	# CONTAINERS	MATRIX				PRESERVATIVE METHOD						SAMPLING	
				WATER	SOIL	AIR	SLUDGE	HCL (2 40ml VOA)	HNO <sub>3</sub>	NaHSO <sub>4</sub>	H <sub>2</sub> SO <sub>4</sub>	ICE (1-1Liter HDPE)	NONE	DATE (2013)	TIME
LAB USE ONLY H30283															
1	F-35 SWD Monitor Well #1	G	3	X					2				1	11/18	13:15
2	F-35 SWD Monitor Well #3-Shallow	G	1	X									1	11/17	10:50
3	F-35 SWD Monitor Well #3-Deep	G	1	X									1	11/17	11:00
4	G-35 SWD Monitor Well #1	G	3	X					2				1	11/18	9:40
5	G-35 SWD Monitor Well #3-Shallow	G	1	X									1	11/17	14:20
6	G-35 SWD Monitor Well #3-Deep	G	1	X									1	11/17	14:30
7	G-35 SWD Monitor Well #4	G	3	X					2				1	11/18	11:30

Relinquished by: **Rozanne Johnson** Date: **11/20/2013** Time: **12:13**

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

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

Received By: (Laboratory Staff) **Jodi Benson** Date: **11/20/2013** Time: **12:16**

Delivered By: (Circle One)

Sampler - UPS - Bus - Other:

Sample Condition

Cool Intact  
Yes ☒ Yes ☒  
No ☐ No ☐

CHECKED BY:

(Initials) **JA**

Phone Results

Yes ☐ No ☐

Fax Results

Yes ☐ No ☐

Additional Fax Number:

REMARKS:

Email Results to:

**hconder@riceswd.com**  
**lweinheimer@rice-ecs.com**  
**kjones@riceswd.com**  
**rozanne@valornet.com**

rozanne11@windstream.net