

1RP-479

2013

Annual Report

DATE

March 13, 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 Case No. 1R0470 Vacuum N-6-1
Date: Monday, March 31, 2014 9:30:56 AM
Attachments: [Vacuum N-6-1 \(1R0479\) 2013 Annual Report 03.31.2014s.pdf](#)

Mr. Lowe,

Attached is the 2013 Annual Groundwater Report for Vacuum N-6-1. 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

Web: www.texerra.com

Texerra LLC

20055 Laredo Ln Monument, CO 80132
Tel: 719-339-6791 E-mail: lpg@texerra.com

March 31st, 2014

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

RE: **2013 Annual Report**
Rice Operating Company
Vacuum N-6-1 Jct, UL N, Sec 6, T18S, R35E
OCD Case Number 1R0479

Mr. Lowe:

This letter summarizes progress made over the past calendar year pursuant to the NMOCD approved Corrective Action Plan for this site (Appendix, Figure 1), which is operated by Rice Operating Company (ROC).

ROC submitted a Vadose Zone Corrective Action Plan (CAP) Update to NMOCD on November 8th, 2013, and approved on January 20th, 2013, which entails the removal of high-chloride soils to 3 ft bgs and the installation of an impermeable, 20-mil reinforced synthetic liner to reduce the potential downward migration of residual soil chlorides. We plan to complete this work during 2014. We also plan to resume pumping high-chloride groundwater from the recovery well and to continue the quarterly sampling of groundwater through 2014.

ROC continued to monitor groundwater chloride concentrations during 2013 (Appendix Figure 2). In brief,

- Approximately 28,390 barrels of chloride-affected groundwater have been removed from the source area between January 2008 and November 2013 (Appendix Figure 3, Table 1). This water was subsequently used for ROC SWD line and well maintenance purposes.
- Groundwater chloride concentrations in the near-source, down-gradient monitor well (MW-1) have dropped more or less continuously over this period from greater than 15,000 mg/l in January 2008 to 3,130 mg/l in November 2013 (Appendix Figure 4, Table 1). Groundwater chloride concentrations in the (down-gradient) recovery well (RW-1) have also generally declined from 5,300 mg/l to 1,800 mg/l over the same period. The more gradual decline in groundwater chloride concentrations in the recovery well are to be expected as groundwater is drawn through and sweeps chloride from the up-gradient, chloride-affected aquifer.

ROC is the service provider (agent) for the Vacuum Salt Water Disposal System and has no ownership of any portion of pipeline, well or facility. The Vacuum SWD System is owned by a

Vacuum N-6-1 2013 Annual Report

consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

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

Sincerely,

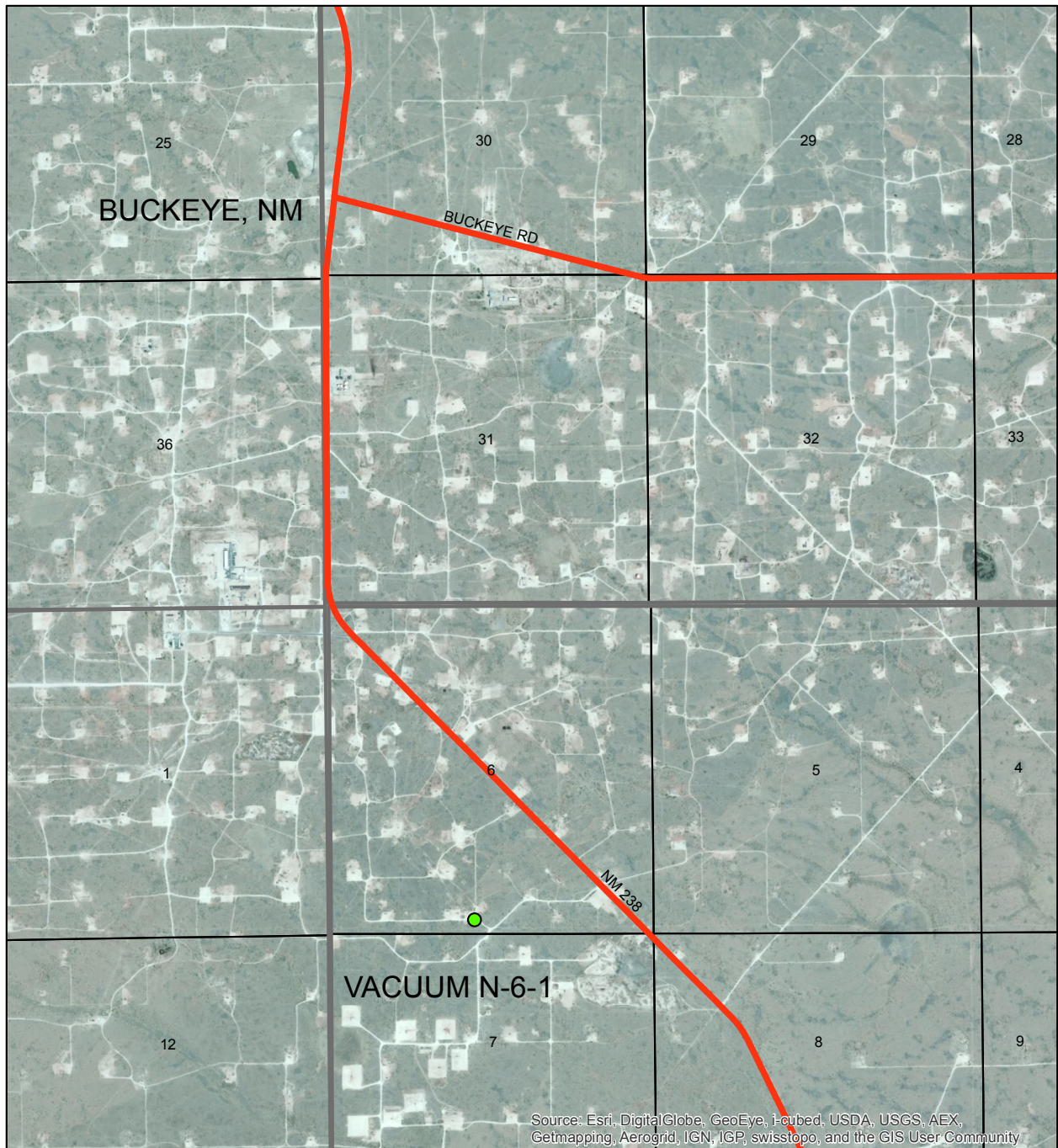
A handwritten signature in black ink, appearing to be 'L. Peter Galusky, Jr.', written in a cursive style.

L. Peter Galusky, Jr. Ph.D.

Copy: Glenn VonGonten, NMOCD; Rice Operating Company

Attachments: Appendix

Site Location Map



VACUUM N-6-1 JUNCTION BOX

**LEGALS: UL/N SEC 6
T-18-S R-35-E**

NMOCD CASE #: 1R0479

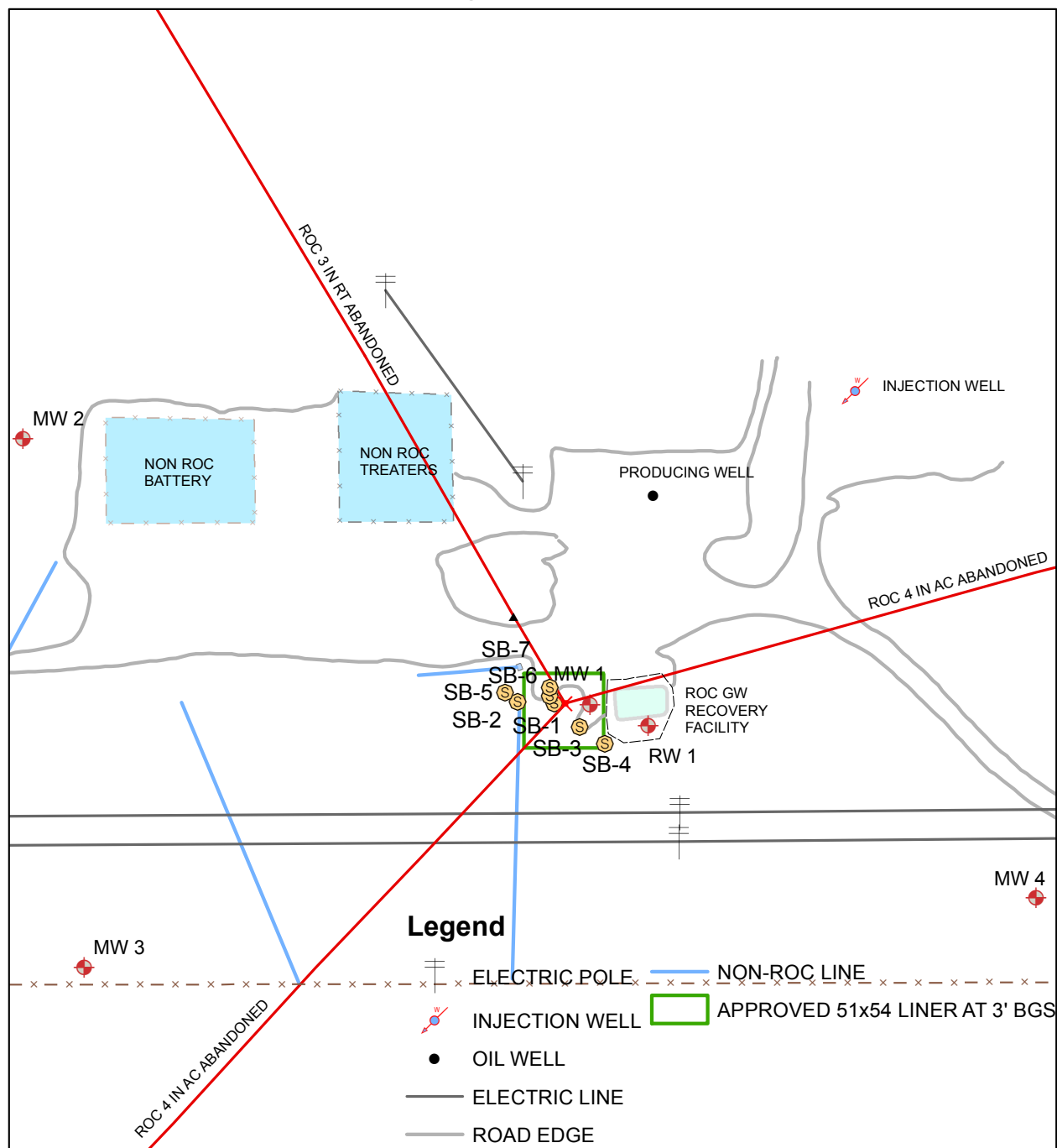
Figure 1



0 0.25 0.5
Miles

Drawing date: 10/7/13
Drafted by: T. Grieco

Monitoring Well Locations



VACUUM N-6-1 JUNCTION BOX

LEGALS: UL/N SEC 6
T-18-S R-35-E

NMOCD CASE #: 1R0479

Figure 2

0 50 100
Feet



GPT date: 7/27/11 TG
Drawing date: 10/7/13
Drafted by: T. Grieco

Figure 3

VAC N-6-1 Groundwater Recovery and Chloride Concentrations

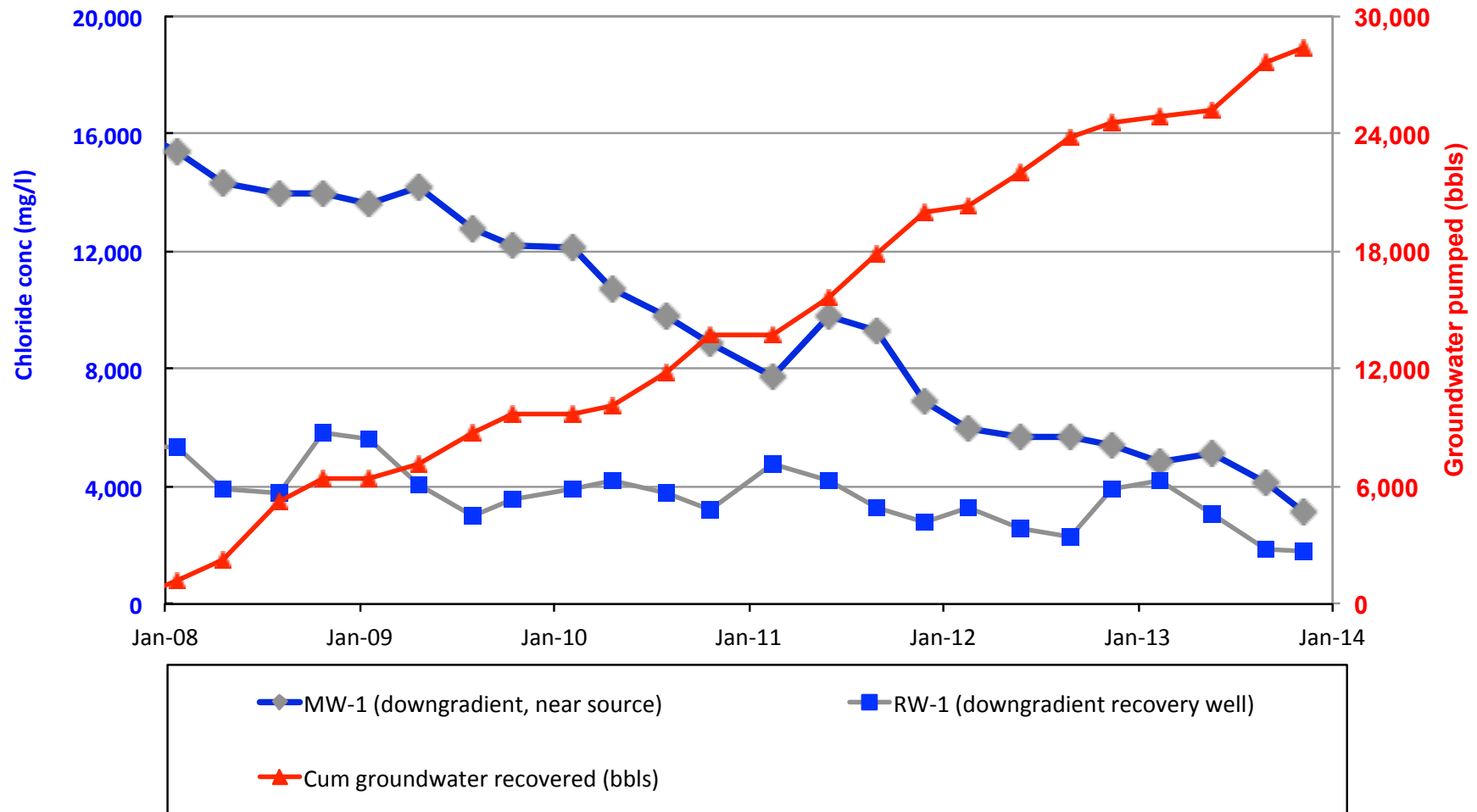


Table 1

date	Groundwater Chloride Conc (mg/l)		Cum groundwater recovered (bbls)
	MW-1 (downgradient, near source)	RW-1 (downgradient recovery well)	
8/25/06	21,900		
10/18/06	21,400		
3/7/07	20,200		
5/29/07	18,500		
9/25/07	15,795	5,398	
10/17/07	16,400	5,400	0
1/31/08	15,400	5,300	1,184
4/24/08	14,300	3,900	2,302
8/7/08	14,000	3,800	5,199
10/30/08	14,000	5,850	6,438
1/23/09	13,600	5,600	6,438
4/29/09	14,200	4,050	7,109
8/7/09	12,800	3,000	8,771
10/22/09	12,200	3,550	9,665
2/11/10	12,100	3,900	9,665
4/26/10	10,700	4,200	10,070
8/5/10	9,800	3,800	11,866
10/28/10	8,900	3,200	13,773
2/21/11	7,730	4,800	13,773
6/6/11	9,800	4,200	15,682
9/2/11	9,300	3,250	17,857
12/4/11	6,900	2,800	20,003
2/24/12	6,000	3,250	20,355
6/1/12	5,700	2,550	21,994
8/31/12	5,700	2,270	23,870
11/16/12	5,400	3,900	24,560
2/14/13	4,850	4,200	24,898
5/23/13	5,100	2,550	25,235
9/4/13	4,100	1,880	27,610
11/13/13	3,130	1,800	28,390



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

November 25, 2013

Hack Conder
Rice Operating Company
112 W. Taylor
Hobbs, NM 88240

RE: VACUUM N-6-1

Enclosed are the results of analyses for samples received by the laboratory on 11/18/13 12:30.

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/ga/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 "Mike Snyder". The signature is fluid and cursive, with the first name "Mike" and last name "Snyder" clearly distinguishable.

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:	11/18/2013	Sampling Date:	11/13/2013
Reported:	11/25/2013	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T18S-R35E-SEC6 L/N-LEA CTY., NM		

Sample ID: MONITOR WELL #1 (H302810-01)

BTX 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	11/21/2013	ND	0.051	103	0.0500	2.69	
Toluene*	<0.001	0.001	11/21/2013	ND	0.051	102	0.0500	2.24	
Ethylbenzene*	<0.001	0.001	11/21/2013	ND	0.051	101	0.0500	2.16	
Total Xylenes*	<0.003	0.003	11/21/2013	ND	0.149	99.0	0.150	1.78	
Total BTX	<0.006	0.006	11/21/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 113 % 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*	3130	4.00	11/25/2013	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	60.9	10.0	11/25/2013	ND	19.8	98.8	20.0	1.86	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	6910	5.00	11/21/2013	ND	256	107	240	5.56	

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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:	11/18/2013	Sampling Date:	11/13/2013
Reported:	11/25/2013	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T18S-R35E-SEC6 L/N-LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H302810-02)

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	11/21/2013	ND	0.051	103	0.0500	2.69	
Toluene*	<0.001	0.001	11/21/2013	ND	0.051	102	0.0500	2.24	
Ethylbenzene*	<0.001	0.001	11/21/2013	ND	0.051	101	0.0500	2.16	
Total Xylenes*	<0.003	0.003	11/21/2013	ND	0.149	99.0	0.150	1.78	
Total BTEX	<0.006	0.006	11/21/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 113 % 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*	32.0	4.00	11/25/2013	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	46.6	10.0	11/25/2013	ND	19.8	98.8	20.0	1.86	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	300	5.00	11/21/2013	ND	256	107	240	5.56	

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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:	11/18/2013	Sampling Date:	11/13/2013
Reported:	11/25/2013	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T18S-R35E-SEC6 L/N-LEA CTY., NM		

Sample ID: MONITOR WELL #3 (H302810-03)

BTX 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	11/21/2013	ND	0.051	103	0.0500	2.69	
Toluene*	<0.001	0.001	11/21/2013	ND	0.051	102	0.0500	2.24	
Ethylbenzene*	<0.001	0.001	11/21/2013	ND	0.051	101	0.0500	2.16	
Total Xylenes*	<0.003	0.003	11/21/2013	ND	0.149	99.0	0.150	1.78	
Total BTX	<0.006	0.006	11/21/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 113 % 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*	32.0	4.00	11/25/2013	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	45.2	10.0	11/25/2013	ND	19.8	98.8	20.0	1.86	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	316	5.00	11/21/2013	ND	256	107	240	5.56	

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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:	11/18/2013	Sampling Date:	11/13/2013
Reported:	11/25/2013	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T18S-R35E-SEC6 L/N-LEA CTY., NM		

Sample ID: MONITOR WELL #4 (H302810-04)

BTX 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	11/21/2013	ND	0.051	103	0.0500	2.69	
Toluene*	<0.001	0.001	11/21/2013	ND	0.051	102	0.0500	2.24	
Ethylbenzene*	<0.001	0.001	11/21/2013	ND	0.051	101	0.0500	2.16	
Total Xylenes*	<0.003	0.003	11/21/2013	ND	0.149	99.0	0.150	1.78	
Total BTX	<0.006	0.006	11/21/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 113 % 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*	28.0	4.00	11/25/2013	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	43.7	10.0	11/25/2013	ND	19.8	98.8	20.0	1.86	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	283	5.00	11/21/2013	ND	256	107	240	5.56	

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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:	11/18/2013	Sampling Date:	11/13/2013
Reported:	11/25/2013	Sampling Type:	Water
Project Name:	VACUUM N-6-1	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T18S-R35E-SEC6 L/N-LEA CTY., NM		

Sample ID: RECOVERY WELL #1 (H302810-05)

BTX 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	11/21/2013	ND	0.051	103	0.0500	2.69	
Toluene*	<0.001	0.001	11/21/2013	ND	0.051	102	0.0500	2.24	
Ethylbenzene*	<0.001	0.001	11/21/2013	ND	0.051	101	0.0500	2.16	
Total Xylenes*	<0.003	0.003	11/21/2013	ND	0.149	99.0	0.150	1.78	
Total BTX	<0.006	0.006	11/21/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 112 % 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*	1800	4.00	11/25/2013	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	60.2	10.0	11/25/2013	ND	19.8	98.8	20.0	1.86	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3550	5.00	11/21/2013	ND	256	107	240	5.56	

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Mike Snyder, Organic Supervisor



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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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A handwritten signature in black ink, appearing to read "Mike Snyder", is written over a horizontal line.

Mike Snyder, Organic Supervisor

