

1RP-427-87

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 NMOCD No. 1R427-87 EME H-20 SWD
Date: Monday, March 31, 2014 12:12:35 PM
Attachments: [EME H-20 \(1R427-87\) 2013 Annual Report 03.31.2014s .pdf](#)

Mr. Lowe,

Attached is the 2013 Annual Groundwater Report for EME H-20 SWD. 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

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E-mail: lpg@texerra.com

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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

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 87504

RE: **2013 Annual Report: OCD Case Number: 1R427-87**
Rice Operating Company – EME SWD System
H-20 SWD (UL H Sec 20 T20S R37E)

Mr. Lowe:

This letter summarizes progress made over the past year pursuant to the NMOCD approved Corrective Action Plan for this site. The site is an active SWD produced water disposal facility operated by Rice Operating Company (ROC) in the EME field, located approximately 4 miles south of Monument, New Mexico (Appendix - Figure 1).

Over the course of 2013 we continued to monitor up and down-gradient monitor wells (Appendix 1 - Figure 2) for chlorides and petroleum hydrocarbons (BTEX). In brief:

1. Groundwater chloride concentrations (Appendix – Figure 3, Table 1) in the up-gradient monitor well (MW-2) declined slightly from the previous year, dropping to an average of 908 mg/l in 2013 from 1,045 mg/l in 2012. There was essentially no change in groundwater chloride concentrations in the at-source monitor well (MW-1), averaging 1,223 mg/l in 2013 versus 1,163 mg/l in 2012. However, groundwater chlorides in the down-gradient monitor well (MW-3) dropped from an average of 1,660 mg/l in 2012 to 1,288 mg/l in 2013. Looking at the data in their entirety there is a general trend downward toward baseline (up-gradient) groundwater chloride levels.
2. Groundwater benzene concentrations (Appendix – Figure 4 & Table 2) rose noticeably in the at-source monitor well (MW-1) from an average of 0.030 mg/l in 2012 to 0.065 mg/l in 2013. Benzene and total BTEX concentrations have remained below detectable limits in the other monitoring wells.

Rice Operating Company: EME H-20 SWD Annual Report

During the course of 2014, we plan to continue the operation of the solar-powered bio-sparg system and to continue the quarterly monitoring of groundwater for chlorides and BTEX.

ROC is the service provider (agent) for the EME Salt Water Disposal System and has no ownership of any portion of pipeline, well or facility. The EME SWD System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

Please do not hesitate to contact either Rice Operating Company or myself if you have any questions or need additional information.

Sincerely,

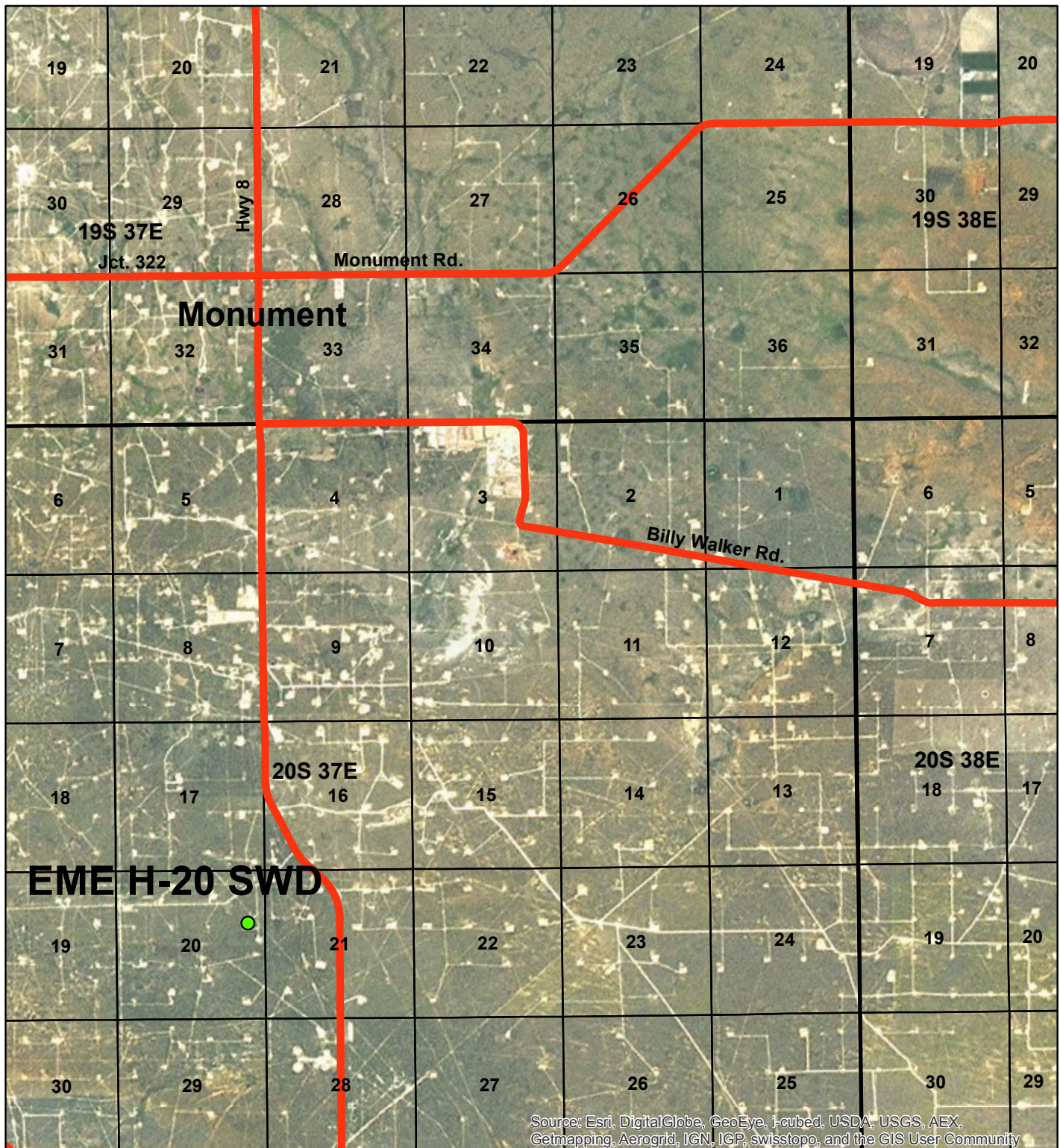
A handwritten signature in black ink, appearing to be 'L. Peter Galusky, Jr.', written over a light gray rectangular background.

L. Peter Galusky, Jr. Ph.D.

Copy: Glenn VonGonten, NMOCD; Rice Operating Company

Attachment: Appendix

Site Location



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



EME H-20 SWD

LEGALS: UL/H sec. 20
T-20-S R-37-E

NMOCD Case #: 1R427-87

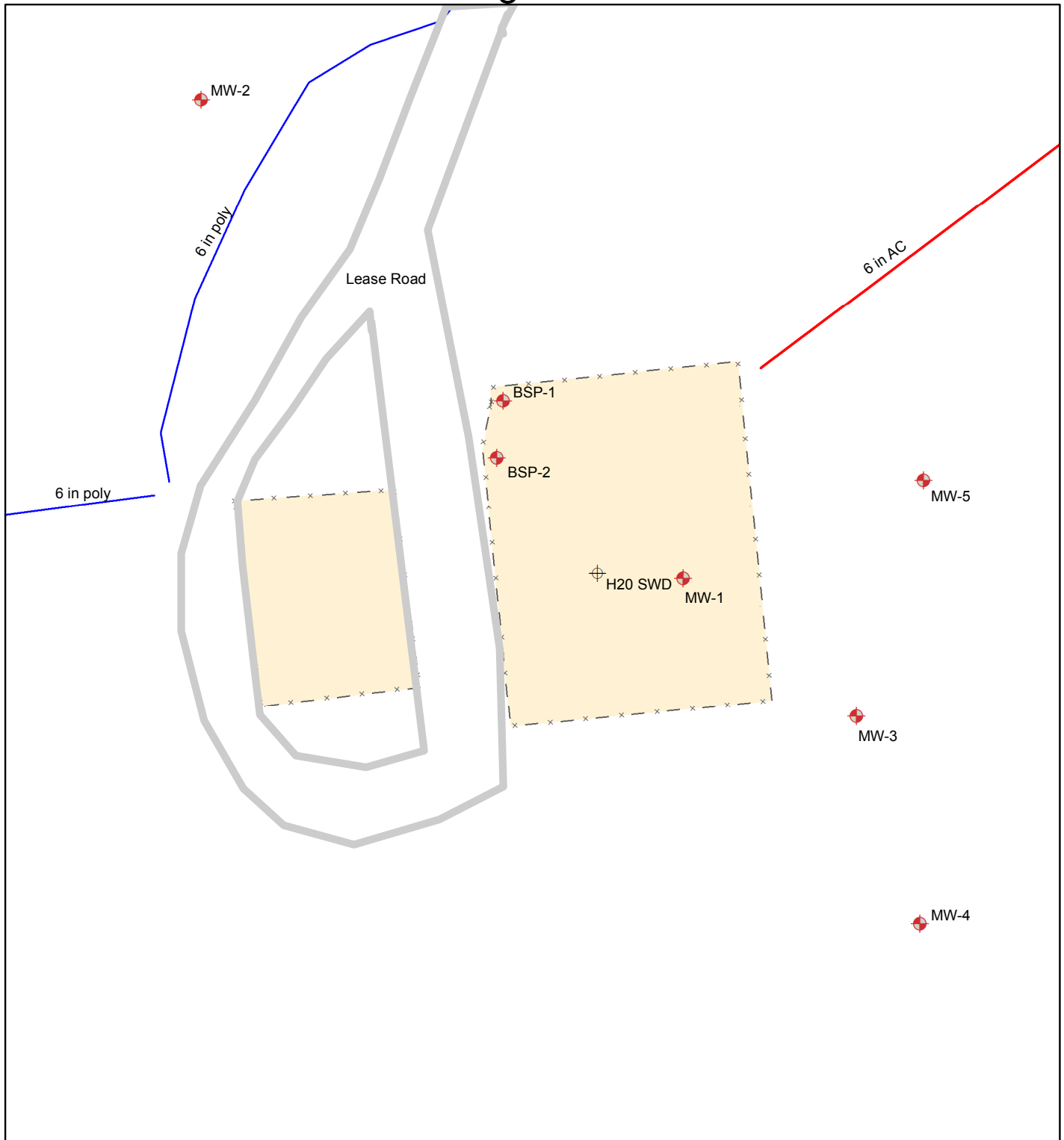
Figure 1



0 0.2750.55 1.1
Miles

Drawing date: 3/18/14
Drafted by: L. Flores

Monitoring Well Locations

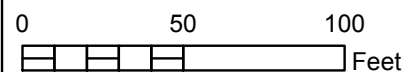


EME H-20 SWD

LEGALS: UL/H sec.20
T-20-S R-37-E

NMOCD Case #: 1R427-87

Figure 2



Drawing date: 3/18/14
Drafted by: L. Flores

Figure 3

EME H-20 SWD Groundwater Chloride Concentrations

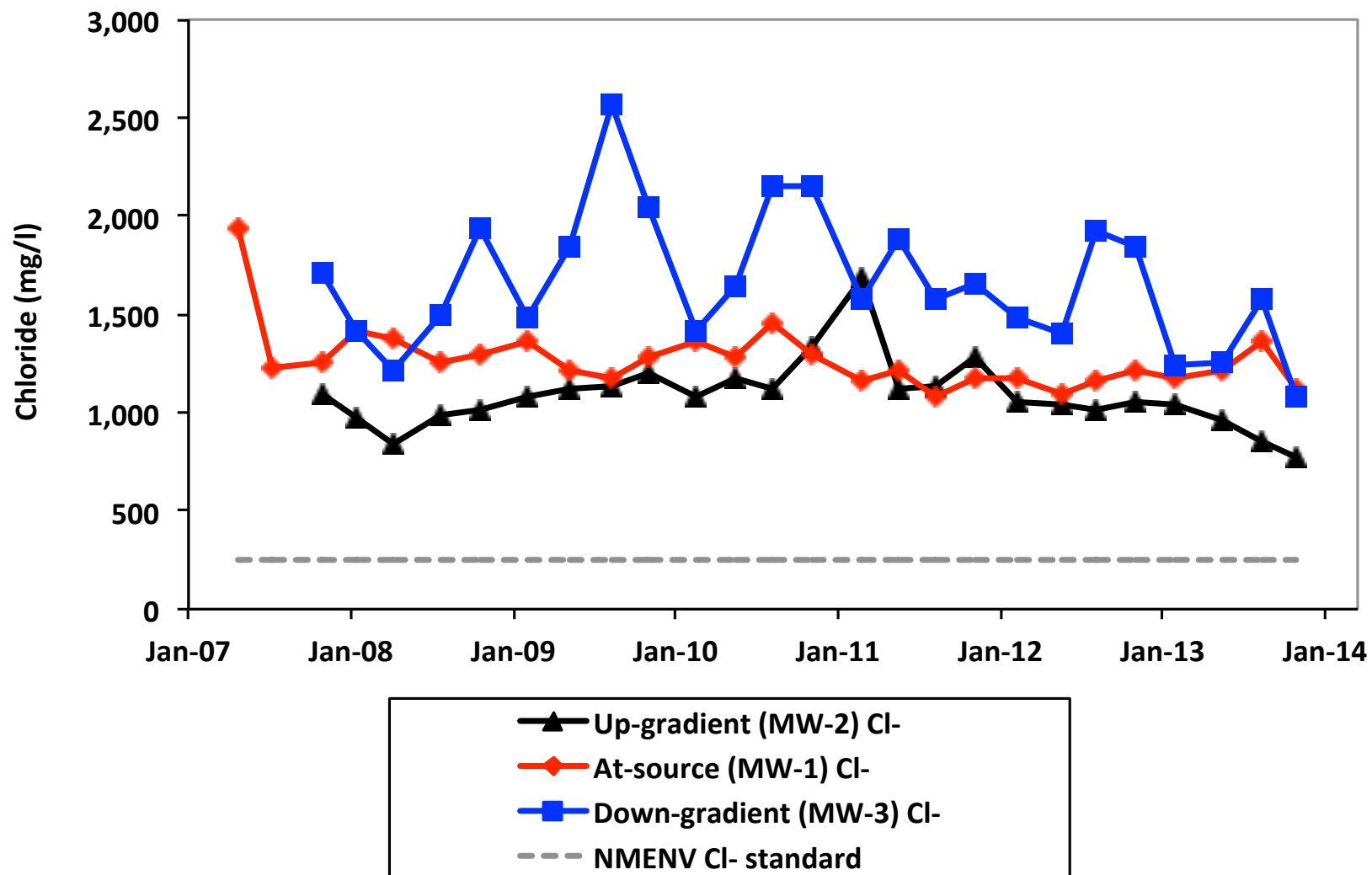


Table 1

EME H-20 SWD					
Groundwater Chloride Concentrations					
	at-source	up-gradient	down-gradient		
<u>Date</u>	<u>MW-1</u>	<u>MW-2</u>	<u>MW-3</u>	<u>MW-4</u>	<u>MW-5</u>
4/23/07	1,939				
7/12/07	1,230				
11/1/07	1,260	1,100	1,710		
1/18/08	1,420	980	1,420		
4/9/08	1,380	840	1,220		
7/21/08	1,250	984	1,500	1,060	1,120
10/20/08	1,300	1,010	1,940	1,120	1,220
2/5/09	1,360	1,080	1,480	1,200	1,180
5/8/09	1,220	1,120	1,840	1,340	1,320
8/14/09	1,180	1,140	2,570	1,240	1,240
11/4/09	1,280	1,200	2,050	1,200	1,260
2/17/10	1,360	1,080	1,420	1,380	1,260
5/19/10	1,280	1,180	1,640	1,340	1,340
8/11/10	1,460	1,120	2,150	1,380	1,400
11/4/10	1,300	1,340	2,150	1,280	1,560
2/26/11	1,160	1,680	1,580	1,440	1,600
5/20/11	1,220	1,120	1,880	1,500	1,680
8/11/11	1,080	1,140	1,580	1,400	1,600
11/9/11	1,180	1,280	1,660	1,480	1,600
2/8/12	1,170	1,060	1,480	1,500	1,560
5/22/12	1,100	1,040	1,400	1,360	1,480
8/7/12	1,160	1,020	1,920	1,360	1,320
10/31/12	1,220	1,060	1,840	1,400	1,240
1/30/13	1,180	1,040	1,240	1,220	1,140
5/14/13	1,230	960	1,250	1,340	1,200
8/14/13	1,360	860	1,580	1,400	1,070
10/31/13	1,120	770	1,080	1,180	1,000
2011 avg	1,160	1,305	1,675	1,455	1,620
2012 avg	1,163	1,045	1,660	1,405	1,400
2013 avg	1,223	908	1,288	1,285	1,103

Figure 4

EME H-20 SWD Groundwater Benzene Concentrations

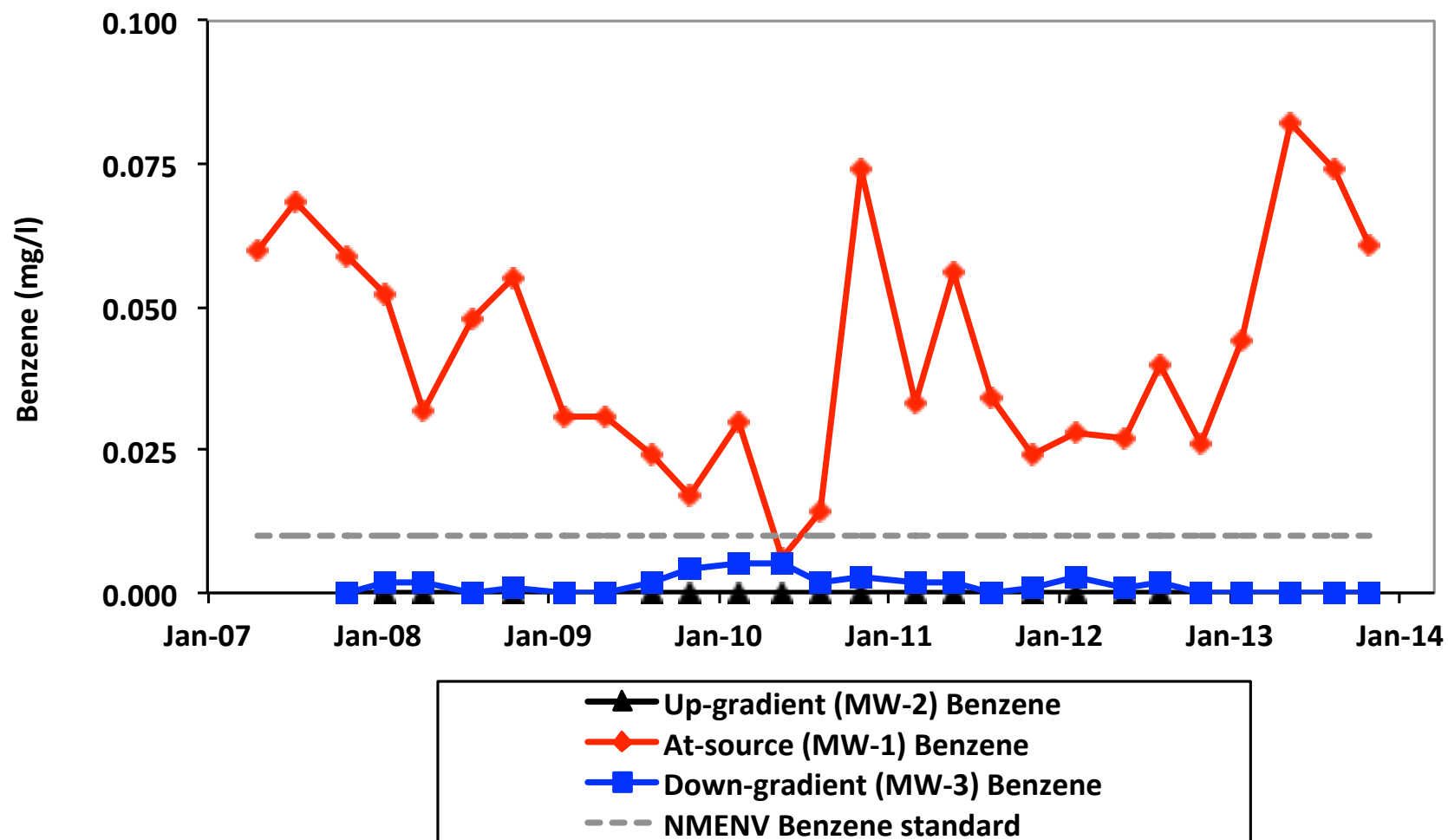


Table 2

**EME H-20 SWD
Groundwater Benzene Concentrations**

<u>Date</u>	<u>MW-1</u>	<u>MW-2</u>	<u>MW-3</u>	<u>MW-4</u>	<u>MW-5</u>
4/23/07	0.060				
7/12/07	0.068				
11/1/07	0.059	<0.002	<0.002		
1/18/08	0.052	<0.001	0.002		
4/9/08	0.032	<0.001	0.002		
7/21/08	0.048	<0.002	<0.002	<0.002	<0.002
10/20/08	0.055	<0.001	0.001	<0.001	<0.001
2/5/09	0.031	<0.001	<0.001	<0.001	<0.001
5/8/09	0.031	<0.001	<0.001	<0.001	<0.001
8/14/09	0.024	<0.001	0.002	<0.001	<0.001
11/4/09	0.017	<0.001	0.004	0.001	<0.001
2/17/10	0.030	<0.001	0.005	<0.001	<0.001
5/19/10	0.006	<0.001	0.005	<0.001	<0.001
8/11/10	0.014	<0.001	0.002	<0.001	<0.001
11/4/10	0.074	<0.001	0.003	0.001	0.082
2/26/11	0.033	<0.001	0.002	<0.001	<0.001
5/20/11	0.056	<0.001	0.002	<0.001	<0.001
8/11/11	0.034	<0.001	<0.001	0.004	<0.001
11/9/11	0.024	<0.001	0.001	0.002	<0.001
2/8/12	0.028	<0.001	0.003	0.002	<0.001
5/22/12	0.027	<0.001	0.001	<0.001	<0.001
8/7/12	0.040	<0.001	0.002	0.001	<0.001
10/31/12	0.026	<0.001	<0.001	<0.001	<0.001
1/30/13	0.044	<0.001	<0.001	<0.001	<0.001
5/14/13	0.082	<0.001	<0.001	<0.001	<0.001
8/14/13	0.074	<0.001	<0.001	<0.001	<0.001
10/31/13	0.061	<0.001	<0.001	<0.001	<0.001
2011 avg	0.037				
2012 avg	0.030				
2013 avg	0.063				



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

November 11, 2013

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

RE: EME JUNCTION H-20

Enclosed are the results of analyses for samples received by the laboratory on 11/06/13 16:08.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. 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 "Coley D. Keene". The signature is written in a cursive, flowing style.

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:	11/06/2013	Sampling Date:	10/31/2013
Reported:	11/11/2013	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #1 (H302708-01)

BTX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.061	0.001	11/10/2013	ND	0.029	115	0.0250	0.496	
Toluene*	<0.001	0.001	11/10/2013	ND	0.028	114	0.0250	0.884	
Ethylbenzene*	<0.001	0.001	11/10/2013	ND	0.029	115	0.0250	0.680	
Total Xylenes*	<0.003	0.003	11/10/2013	ND	0.085	113	0.0750	0.408	
Total BTX	0.061	0.006	11/10/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID) 107 % 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*	1120	4.00	11/07/2013	ND	100	100	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*	832	125	11/11/2013	ND	17.5	87.4	20.0	0.627	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3830	5.00	11/08/2013	ND	256	107	240	5.84	

Cardinal Laboratories

*=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:	11/06/2013	Sampling Date:	10/31/2013
Reported:	11/11/2013	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #2 (H302708-02)

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	11/10/2013	ND	0.029	115	0.0250	0.496	
Toluene*	<0.001	0.001	11/10/2013	ND	0.028	114	0.0250	0.884	
Ethylbenzene*	<0.001	0.001	11/10/2013	ND	0.029	115	0.0250	0.680	
Total Xylenes*	<0.003	0.003	11/10/2013	ND	0.085	113	0.0750	0.408	
Total BTEX	<0.006	0.006	11/10/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID) 110 % 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*	770	4.00	11/07/2013	ND	100	100	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*	670	125	11/11/2013	ND	17.5	87.4	20.0	0.627	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	2900	5.00	11/08/2013	ND	256	107	240	5.84	

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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:	11/06/2013	Sampling Date:	10/31/2013
Reported:	11/11/2013	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #3 (H302708-03)

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	11/10/2013	ND	0.029	115	0.0250	0.496	
Toluene*	<0.001	0.001	11/10/2013	ND	0.028	114	0.0250	0.884	
Ethylbenzene*	<0.001	0.001	11/10/2013	ND	0.029	115	0.0250	0.680	
Total Xylenes*	<0.003	0.003	11/10/2013	ND	0.085	113	0.0750	0.408	
Total BTEX	<0.006	0.006	11/10/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID) 110 % 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*	1080	4.00	11/07/2013	ND	100	100	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*	771	250	11/11/2013	ND	17.5	87.4	20.0	0.627	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3540	5.00	11/08/2013	ND	256	107	240	5.84	

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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:	11/06/2013	Sampling Date:	10/31/2013
Reported:	11/11/2013	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #4 (H302708-04)

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	11/10/2013	ND	0.029	115	0.0250	0.496	
Toluene*	<0.001	0.001	11/10/2013	ND	0.028	114	0.0250	0.884	
Ethylbenzene*	<0.001	0.001	11/10/2013	ND	0.029	115	0.0250	0.680	
Total Xylenes*	<0.003	0.003	11/10/2013	ND	0.085	113	0.0750	0.408	
Total BTEX	<0.006	0.006	11/10/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID) 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*	1180	4.00	11/07/2013	ND	100	100	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*	780	125	11/11/2013	ND	17.5	87.4	20.0	0.627	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3730	5.00	11/08/2013	ND	256	107	240	5.84	

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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:	11/06/2013	Sampling Date:	10/31/2013
Reported:	11/11/2013	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #5 (H302708-05)

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	11/10/2013	ND	0.029	115	0.0250	0.496	
Toluene*	<0.001	0.001	11/10/2013	ND	0.028	114	0.0250	0.884	
Ethylbenzene*	<0.001	0.001	11/10/2013	ND	0.029	115	0.0250	0.680	
Total Xylenes*	<0.003	0.003	11/10/2013	ND	0.085	113	0.0750	0.408	
Total BTEX	<0.006	0.006	11/10/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID) 110 % 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*	1000	4.00	11/07/2013	ND	100	100	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*	750	125	11/11/2013	ND	17.5	87.4	20.0	0.627	

TDS 160.1		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3460	5.00	11/08/2013	ND	256	107	240	5.84	

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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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