

L. Peter Galusky, Jr. P.E.

Texerra LLC

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March 18th, 2015

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

RE: **2014 Annual Report: OCD Case Number: 1R427-87**
Rice Operating Company – EME SWD System
H-20 SWD (UL H, Sec 20, T20S, R37E)

Sent by E-mail

Dr. Oberding:

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 2014 we continued to monitor up and down-gradient monitor wells (Appendix, 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 780 mg/l in 2014 from 908 mg/l in 2013. Year average groundwater chloride concentrations in the at-source monitor well (MW-1) dropped from 1,223 mg/l in 2013 to 1,135 mg/l in 2014. Groundwater chlorides in the down-gradient monitor well (MW-3) dropped slightly from an average of 1,288 mg/l in 2013 to 1,230 mg/l in 2014.
2. Groundwater benzene concentrations (Appendix, Figure 4 & Table 2) dropped noticeably in the at-source monitor well (MW-1) from an average of 0.065 mg/l in 2013 to 0.029 mg/l in 2014. Benzene and total BTEX concentrations continued to measure below detectable limits in the other monitoring wells through 2014.

During the course of 2015, we plan to continue the operation of the solar-powered bio-spargers 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.

Rice Operating Company: EME H-20 SWD Annual Report

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

Sincerely,

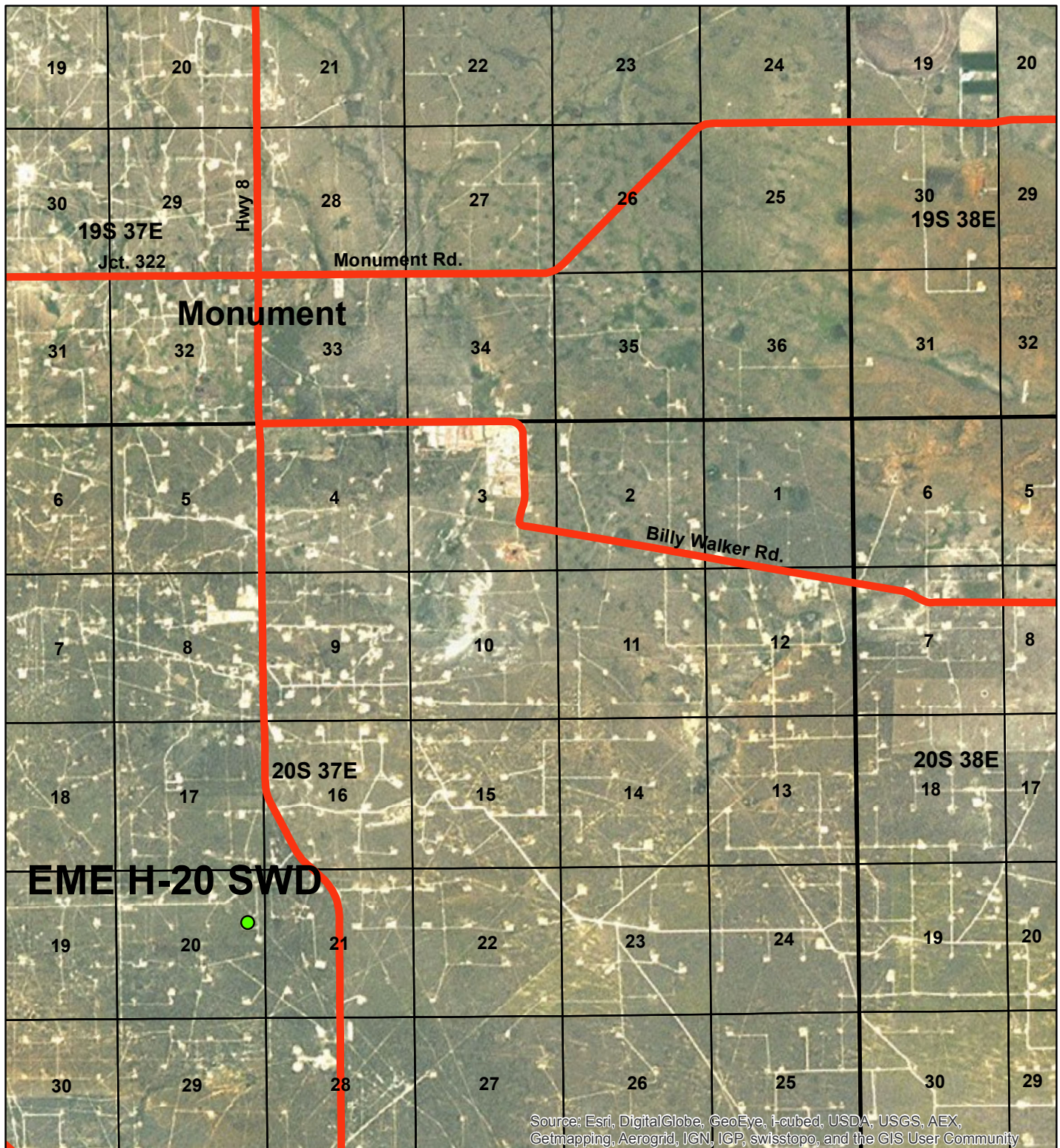
A handwritten signature in black ink, appearing to be 'L. Peter Galusky, Jr.', written over a light gray rectangular background.

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

Copy: Rice Operating Company

Attachment: Appendix

Site Location



EME H-20 SWD

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

NMOCD Case #: 1R427-87

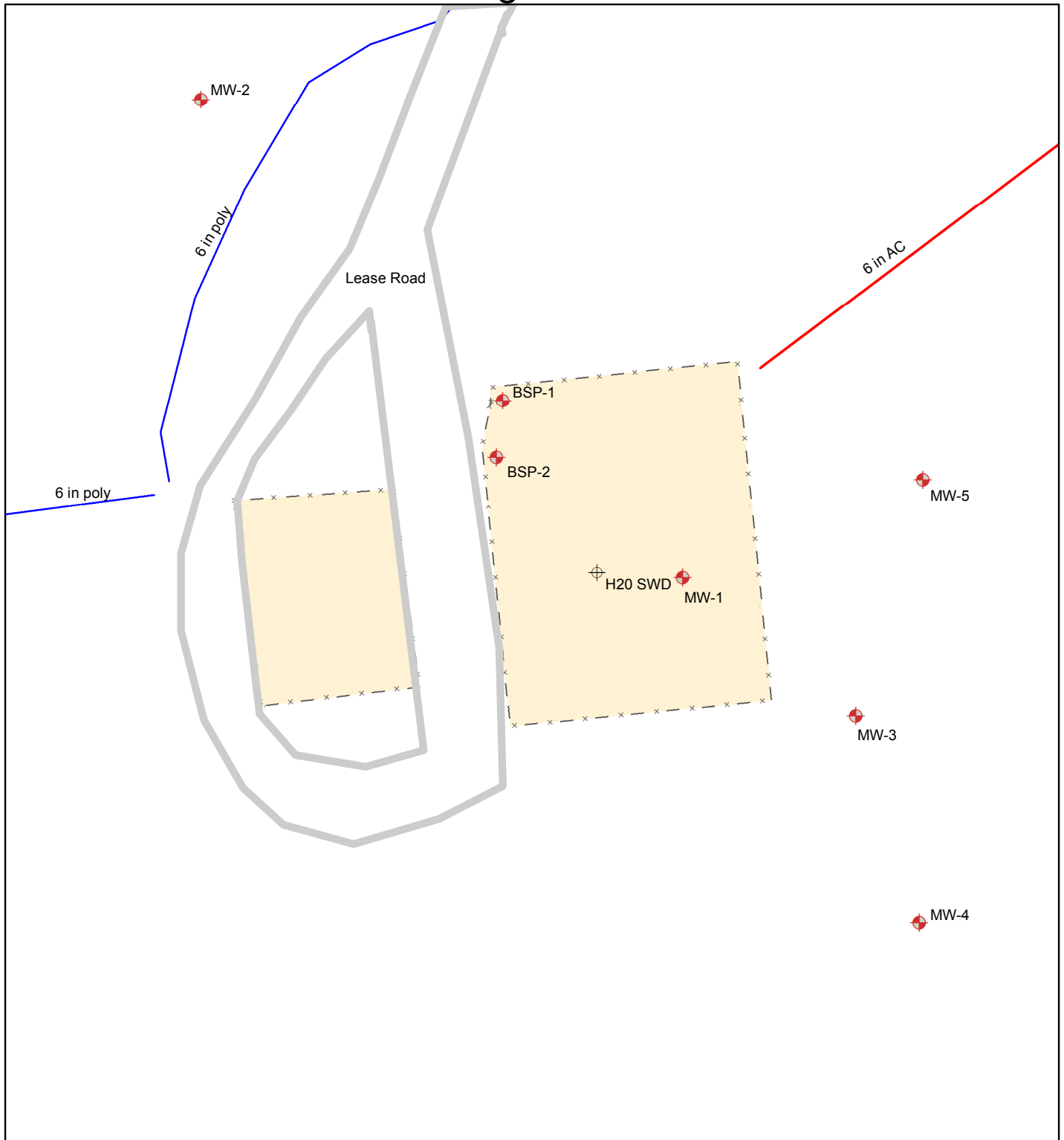
Figure 1



0 0.2750.55 1.1
Miles

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

Monitoring Well Locations

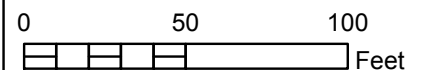


EME H-20 SWD

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

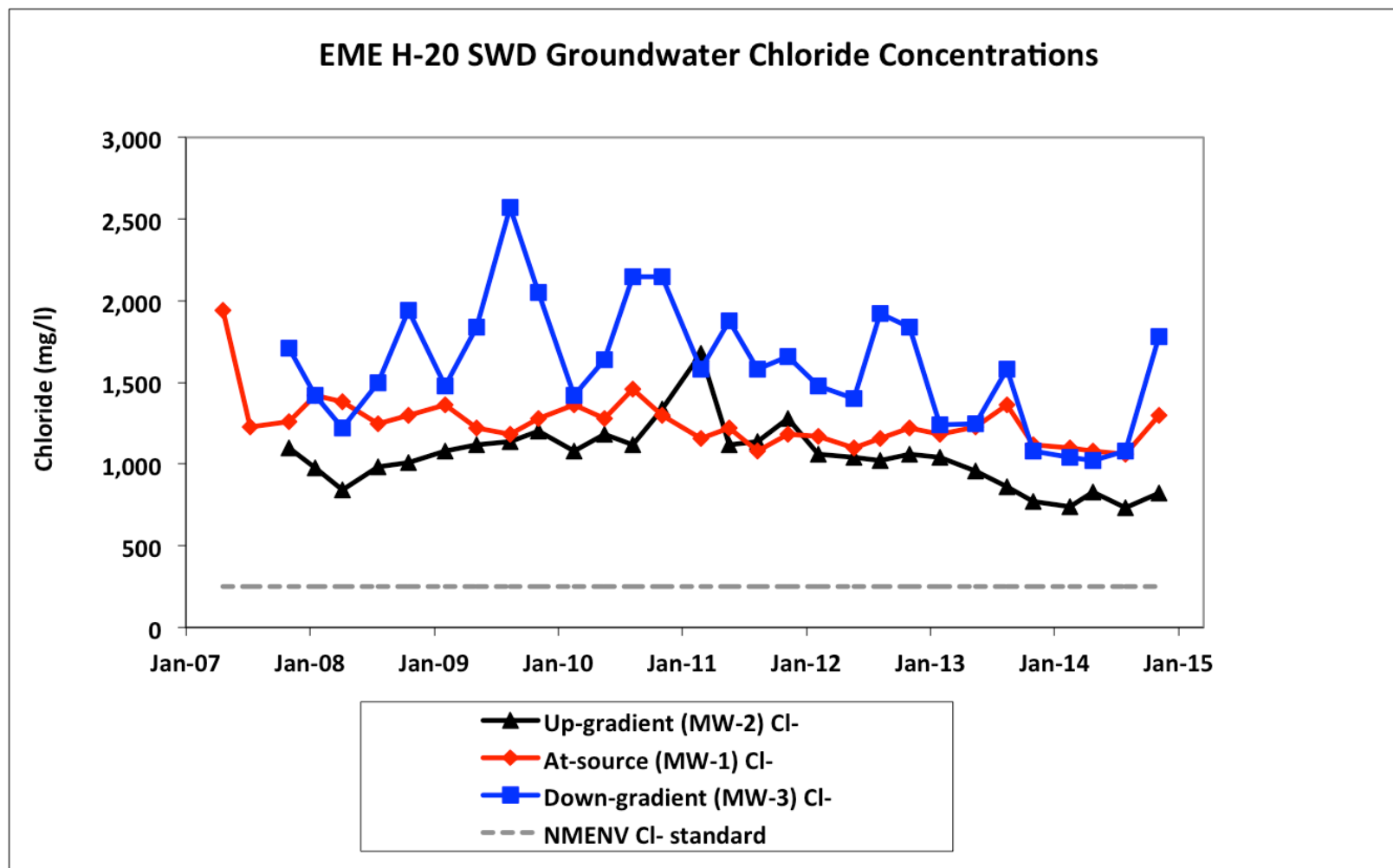


Table 1**EME H-20 SWD****Groundwater Chloride Concentrations**

	at-source	up-gradient	down-gradient			NMENV
<u>Date</u>	<u>MW-1</u>	<u>MW-2</u>	<u>MW-3</u>	<u>MW-4</u>	<u>MW-5</u>	<u>Standard</u>
4/23/07	1,939					250
7/12/07	1,230					250
11/1/07	1,260	1,100	1,710			250
1/18/08	1,420	980	1,420			250
4/9/08	1,380	840	1,220			250
7/21/08	1,250	984	1,500	1,060	1,120	250
10/20/08	1,300	1,010	1,940	1,120	1,220	250
2/5/09	1,360	1,080	1,480	1,200	1,180	250
5/8/09	1,220	1,120	1,840	1,340	1,320	250
8/14/09	1,180	1,140	2,570	1,240	1,240	250
11/4/09	1,280	1,200	2,050	1,200	1,260	250
2/17/10	1,360	1,080	1,420	1,380	1,260	250
5/19/10	1,280	1,180	1,640	1,340	1,340	250
8/11/10	1,460	1,120	2,150	1,380	1,400	250
11/4/10	1,300	1,340	2,150	1,280	1,560	250
2/26/11	1,160	1,680	1,580	1,440	1,600	250
5/20/11	1,220	1,120	1,880	1,500	1,680	250
8/11/11	1,080	1,140	1,580	1,400	1,600	250
11/9/11	1,180	1,280	1,660	1,480	1,600	250
2/8/12	1,170	1,060	1,480	1,500	1,560	250
5/22/12	1,100	1,040	1,400	1,360	1,480	250
8/7/12	1,160	1,020	1,920	1,360	1,320	250
10/31/12	1,220	1,060	1,840	1,400	1,240	250
1/30/13	1,180	1,040	1,240	1,220	1,140	250
5/14/13	1,230	960	1,250	1,340	1,200	250
8/14/13	1,360	860	1,580	1,400	1,070	250
10/31/13	1,120	770	1,080	1,180	1,000	250
2/18/14	1,100	740	1,040	1,200	1,000	250
4/24/14	1,080	830	1,020	1,240	1,060	250
7/31/14	1,060	730	1,080	1,220	1,040	250
11/6/14	1,300	820	1,780	920	1,100	250
2011 avg	1,160	1,305	1,675	1,455	1,620	250
2012 avg	1,163	1,045	1,660	1,405	1,400	250
2013 avg	1,223	908	1,288	1,285	1,103	250
2014 avg	1,135	780	1,230	1,145	1,050	250

Figure 4

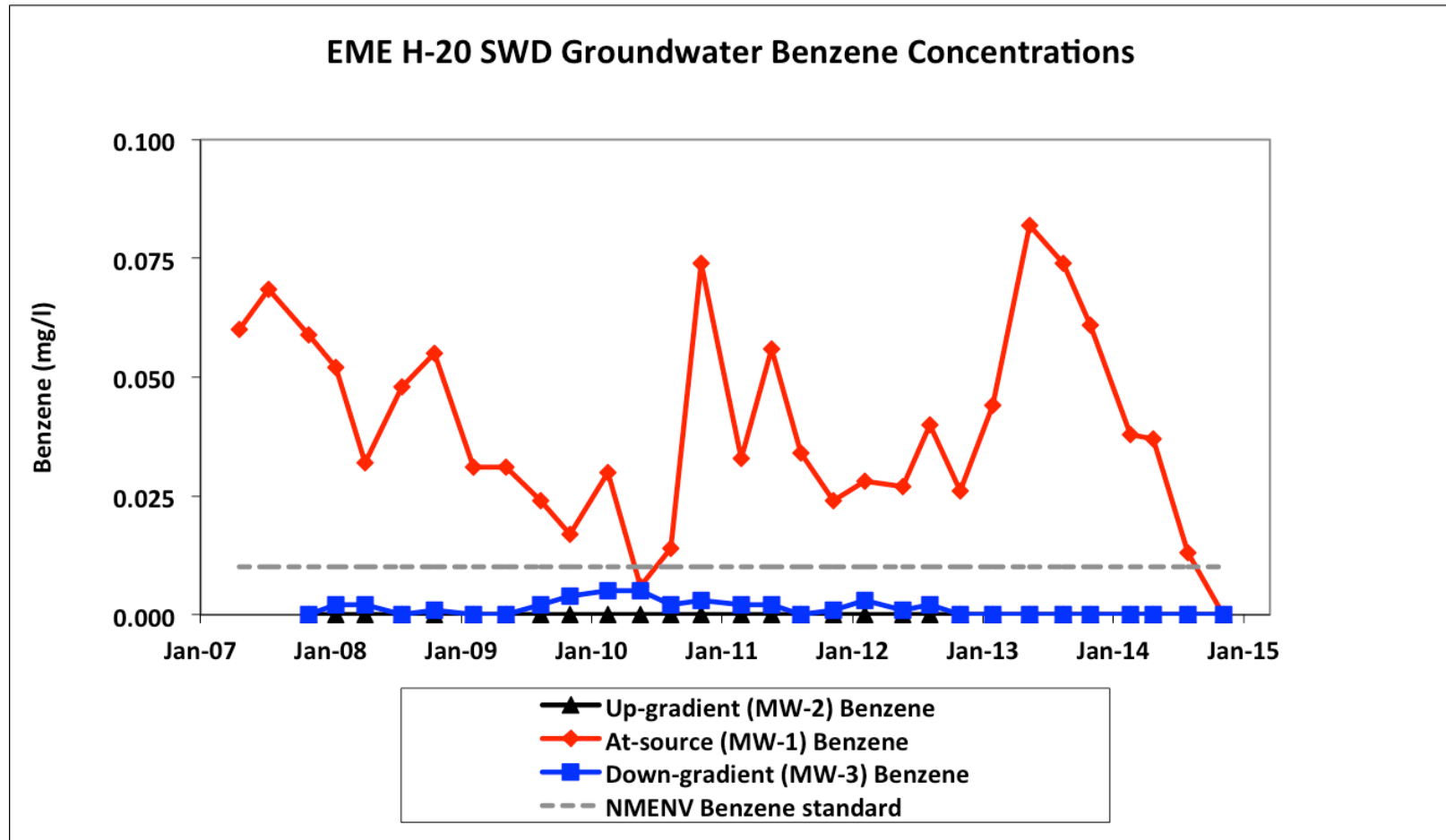


Table 2**EME H-20 SWD****Groundwater Benzene Concentrations**

<u>Date</u>	<u>MW-1</u>	<u>MW-2</u>	<u>MW-3</u>	<u>MW-4</u>	<u>MW-5</u>	NMENV Standard
4/23/07	0.060					0.01
7/12/07	0.068					0.01
11/1/07	0.059	<0.002	<0.002			0.01
1/18/08	0.052	<0.001	0.002			0.01
4/9/08	0.032	<0.001	0.002			0.01
7/21/08	0.048	<0.002	<0.002	<0.002	<0.002	0.01
10/20/08	0.055	<0.001	0.001	<0.001	<0.001	0.01
2/5/09	0.031	<0.001	<0.001	<0.001	<0.001	0.01
5/8/09	0.031	<0.001	<0.001	<0.001	<0.001	0.01
8/14/09	0.024	<0.001	0.002	<0.001	<0.001	0.01
11/4/09	0.017	<0.001	0.004	0.001	<0.001	0.01
2/17/10	0.030	<0.001	0.005	<0.001	<0.001	0.01
5/19/10	0.006	<0.001	0.005	<0.001	<0.001	0.01
8/11/10	0.014	<0.001	0.002	<0.001	<0.001	0.01
11/4/10	0.074	<0.001	0.003	0.001	0.082	0.01
2/26/11	0.033	<0.001	0.002	<0.001	<0.001	0.01
5/20/11	0.056	<0.001	0.002	<0.001	<0.001	0.01
8/11/11	0.034	<0.001	<0.001	0.004	<0.001	0.01
11/9/11	0.024	<0.001	0.001	0.002	<0.001	0.01
2/8/12	0.028	<0.001	0.003	0.002	<0.001	0.01
5/22/12	0.027	<0.001	0.001	<0.001	<0.001	0.01
8/7/12	0.040	<0.001	0.002	0.001	<0.001	0.01
10/31/12	0.026	<0.001	<0.001	<0.001	<0.001	0.01
1/30/13	0.044	<0.001	<0.001	<0.001	<0.001	0.01
5/14/13	0.082	<0.001	<0.001	<0.001	<0.001	0.01
8/14/13	0.074	<0.001	<0.001	<0.001	<0.001	0.01
10/31/13	0.061	<0.001	<0.001	<0.001	<0.001	0.01
2/18/14	0.038	<0.001	<0.001	<0.001	<0.001	0.01
4/24/14	0.037	<0.001	<0.001	<0.001	<0.001	0.01
7/31/14	0.013	<0.001	<0.001	<0.001	<0.001	0.01
11/6/14	<0.001	<0.001	<0.001	<0.001	<0.001	0.01
2011 avg	0.037					0.01
2012 avg	0.030					0.01
2013 avg	0.063					0.01
2014 avg	0.029					

November 18, 2014

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 11/11/14 16:57.

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,



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:	11/11/2014	Sampling Date:	11/06/2014
Reported:	11/18/2014	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #1 (H403467-01)

BTEX 8260B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	11/14/2014	ND	0.021	105	0.0200	4.07	
Toluene*	<0.001	0.001	11/14/2014	ND	0.021	107	0.0200	4.74	
Ethylbenzene*	<0.001	0.001	11/14/2014	ND	0.021	106	0.0200	6.40	
Total Xylenes*	<0.003	0.003	11/14/2014	ND	0.064	107	0.0600	4.40	
Total BTEX	<0.006	0.006	11/14/2014	ND					

Surrogate: Dibromofluoromethane 109 % 88.3-113

Surrogate: Toluene-d8 102 % 90.3-115

Surrogate: 4-Bromofluorobenzene 97.8 % 87.2-114

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	1300	4.00	11/12/2014	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*	983	125	11/14/2014	ND	16.9	84.6	20.0	7.62	

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	4340	5.00	11/14/2014	ND	512	97.2	527	1.26		

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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:	11/11/2014	Sampling Date:	11/06/2014
Reported:	11/18/2014	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #2 (H403467-02)

BTEX 8260B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	11/14/2014	ND	0.021	105	0.0200	4.07		
Toluene*	<0.001	0.001	11/14/2014	ND	0.021	107	0.0200	4.74		
Ethylbenzene*	<0.001	0.001	11/14/2014	ND	0.021	106	0.0200	6.40		
Total Xylenes*	<0.003	0.003	11/14/2014	ND	0.064	107	0.0600	4.40		
Total BTEX	<0.006	0.006	11/14/2014	ND						

Surrogate: Dibromofluoromethane 109 % 88.3-113

Surrogate: Toluene-d8 99.9 % 90.3-115

Surrogate: 4-Bromofluorobenzene 98.7 % 87.2-114

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	820	4.00	11/12/2014	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*	539	83.3	11/14/2014	ND	16.9	84.6	20.0	7.62		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	2910	5.00	11/14/2014	ND	512	97.2	527	1.26		

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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:	11/11/2014	Sampling Date:	11/06/2014
Reported:	11/18/2014	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #3 (H403467-03)

BTEX 8260B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	11/14/2014	ND	0.021	105	0.0200	4.07		
Toluene*	<0.001	0.001	11/14/2014	ND	0.021	107	0.0200	4.74		
Ethylbenzene*	<0.001	0.001	11/14/2014	ND	0.021	106	0.0200	6.40		
Total Xylenes*	<0.003	0.003	11/14/2014	ND	0.064	107	0.0600	4.40		
Total BTEX	<0.006	0.006	11/14/2014	ND						

Surrogate: Dibromofluoromethane 104 % 88.3-113

Surrogate: Toluene-d8 96.2 % 90.3-115

Surrogate: 4-Bromofluorobenzene 97.8 % 87.2-114

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	1780	4.00	11/12/2014	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*	889	250	11/14/2014	ND	16.9	84.6	20.0	7.62		

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	4910	5.00	11/14/2014	ND	512	97.2	527	1.26		

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Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	11/11/2014	Sampling Date:	11/06/2014
Reported:	11/18/2014	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #4 (H403467-04)

BTEX 8260B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	11/14/2014	ND	0.021	105	0.0200	4.07		
Toluene*	<0.001	0.001	11/14/2014	ND	0.021	107	0.0200	4.74		
Ethylbenzene*	<0.001	0.001	11/14/2014	ND	0.021	106	0.0200	6.40		
Total Xylenes*	<0.003	0.003	11/14/2014	ND	0.064	107	0.0600	4.40		
Total BTEX	<0.006	0.006	11/14/2014	ND						

Surrogate: Dibromofluoromethane 108 % 88.3-113

Surrogate: Toluene-d8 98.8 % 90.3-115

Surrogate: 4-Bromofluorobenzene 96.7 % 87.2-114

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	920	4.00	11/12/2014	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*	501	83.3	11/14/2014	ND	16.9	84.6	20.0	7.62	

TDS 160.1		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	3410	5.00	11/14/2014	ND	512	97.2	527	1.26		

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Received:	11/11/2014	Sampling Date:	11/06/2014
Reported:	11/18/2014	Sampling Type:	Water
Project Name:	EME JUNCTION H-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T20S-R37E-SEC20 H-LEA CTY, NM		

Sample ID: MONITOR WELL #5 (H403467-05)

BTEX 8260B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	11/14/2014	ND	0.021	105	0.0200	4.07		
Toluene*	<0.001	0.001	11/14/2014	ND	0.021	107	0.0200	4.74		
Ethylbenzene*	<0.001	0.001	11/14/2014	ND	0.021	106	0.0200	6.40		
Total Xylenes*	<0.003	0.003	11/14/2014	ND	0.064	107	0.0600	4.40		
Total BTEX	<0.006	0.006	11/14/2014	ND						

Surrogate: Dibromofluoromethane 106 % 88.3-113

Surrogate: Toluene-d8 97.5 % 90.3-115

Surrogate: 4-Bromofluorobenzene 93.9 % 87.2-114

Chloride, SM4500Cl-B		mg/L	Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	1100	4.00	11/12/2014	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*	549	83.3	11/14/2014	ND	16.9	84.6	20.0	7.62	
TDS 160.1	mg/L	Analyzed By: AP							

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	3500	5.00	11/14/2014	ND	512	97.2	527	1.26		

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



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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Celey D. Keene, Lab Director/Quality Manager

Cardinal Laboratories, Inc.		101 East Marland - Hobbs, New Mexico 88240 (575) 393-2326 Tel (575) 393-2476 Fax	
Company Name: RICE Operating Company		Project Manager: Hack Conder	
BILL TO Company: RICE Operating Company		Address: 122 W Taylor Street ~ Hobbs, New Mexico 88240	
PO#		Phone#: (575) 393-9174	
		Fax#: (575) 397-1471	
Project #: (575) 393-9174		Project Name: EME Junction H-20	
Project Location: T20S-R37E-Sec20 H ~ Lea County - New Mexico		Sampler Signature: Rozanne Johnson (575) 631-9310	
LAB #		LAB USE ONLY	
FIELD CODE		(G)rab or (C)omp	
# CONTAINERS		MATRIX	
WATER		PRESERVATIVE	
SOIL		SAMPLING	
AIR			
SLUDGE			
HCL (2.40ml VOA)			
HNO₃			
NaHSO₄			
H₂SO₄			
ICE (1-1Lier HDPE)			
NONE			
DATE (2014)			
TIME			
MTBE 8021B/602			
BTEX 8021B/602			
TPH 418: 1/7X1005 / TX1005 Extended (C35)			
PAH 8270C			
Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7			
TCLP Metals Ag As Ba Cd Cr Pb Se Hg			
TCLP Volatiles			
TCLP Semi Volatiles			
TCLP Pesticides			
RCI			
GC/MS Vol. 8260B/624			
GC/MS Semi. Vol. 8270C/625			
PCBs 8082/608			
Pesticides 8081A/608			
BOD, TSS, pH			
Moisture Content			
Cations (Ca, Mg, Na, K)			
Anions (Cl, SO₄, CO₃, HCO₃)			
Sulfates			
Total Dissolved Solids			
Chlorides			
Turn Around Time ~ 24 Hours			
ANALYSIS REQUEST		LAB Order ID #	
CHAIN-OF-CUSTODY AND ANALYSIS REQUEST			
REMARKS:		Phone Results	
Fax Results		Additional Fax Number:	
Relinquished by: Rozanne Johnson		Date: 11/16/2014	
Time: 16:56			
Received by: (Laboratory Staff)		Date: 11/10/2014	
Time: 16:57			
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No		No	
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