1RP-427-87

2013 Annual Report

DATE March 31, 2014

From: <u>L Peter Galusky</u>
To: <u>Lowe, Leonard, EMNRD</u>

 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: <u>EME H-20 (1R427-87) 2013 Annual Report 03.31.2014s .pdf</u>

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

Cell: 719-339-6791 E-mail: lpg@texerra.com Web: 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

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.
- Groundwater benzene concentrations (Appendix Figure 4 & Table 2) rose noticeably in the atsource 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-sparge 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,

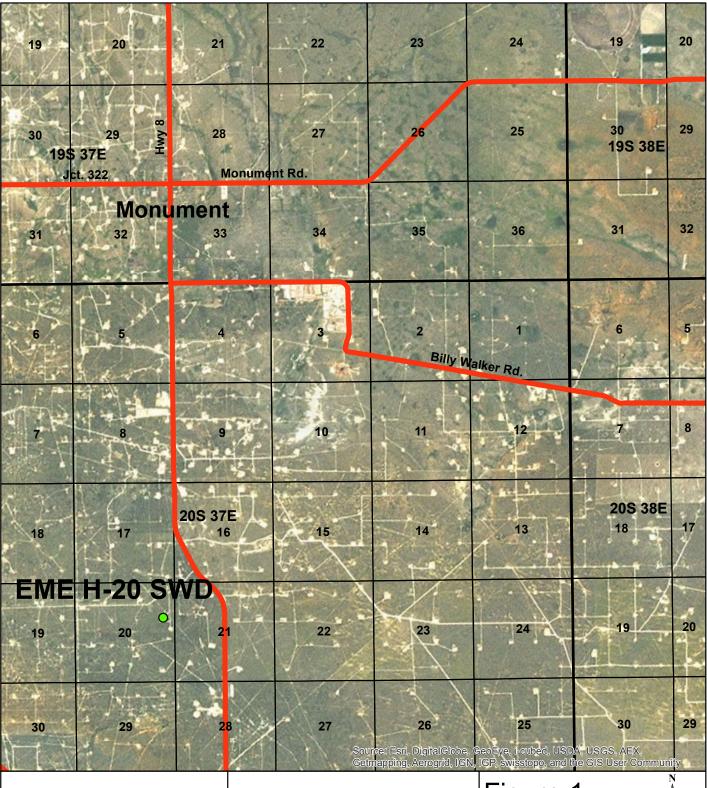
L. Peter Galusky, Jr. Ph.D.

Copy: Glenn VonGonten, NMOCD; Rice Operating Company

Attachment: Appendix

Texerra 2

Site Location





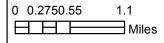
EME H-20 SWD

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

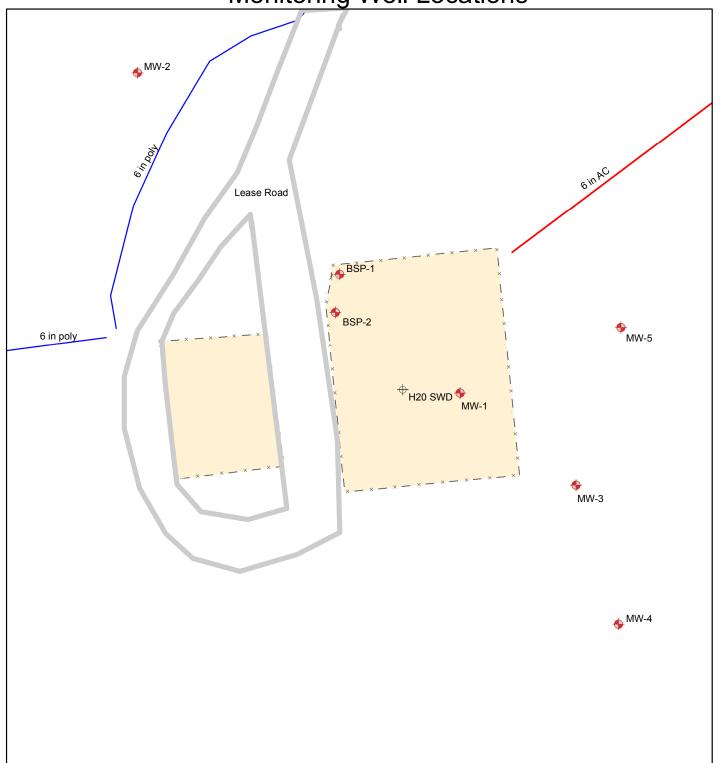
NMOCD Case #: 1R427-87

Figure 1





Drawing date: 3/18/14 Drafted by: L. Flores **Monitoring Well Locations**

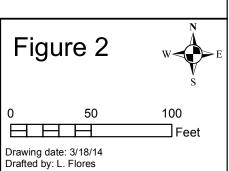




EME H-20 SWD

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

NMOCD Case #: 1R427-87



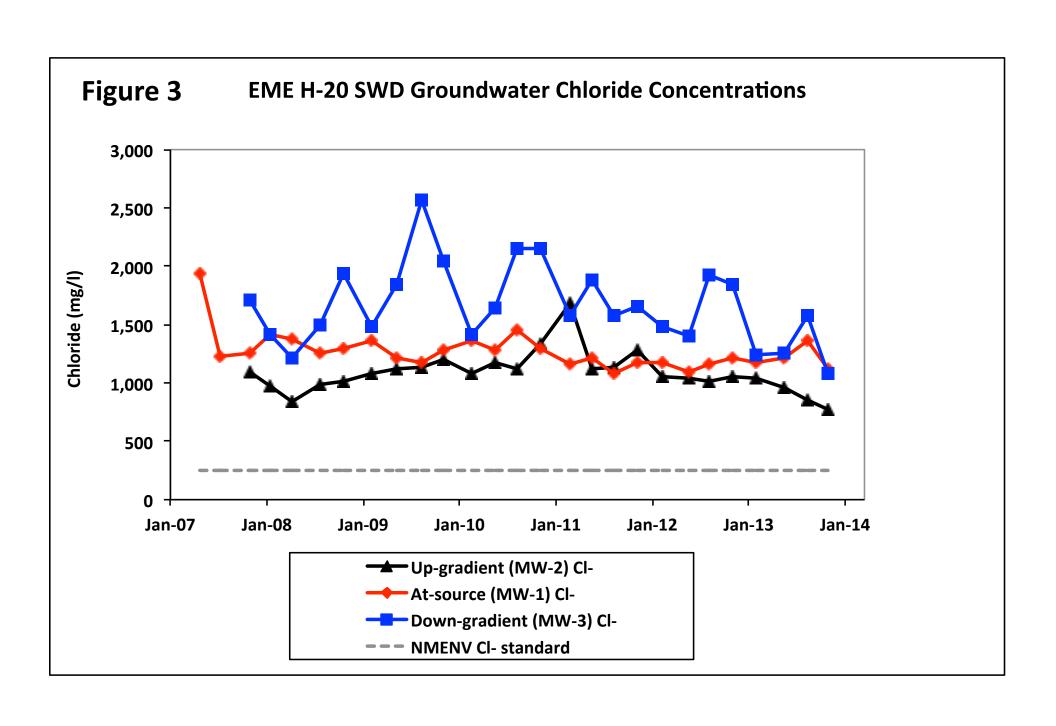


Table 1

EME H-20 SWD Groundwater Chloride Concentrations

	at-source	up-gradient	down-gradie	nt	
Date	MW-1	MW-2	MW-3	MW-4	MW-5
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

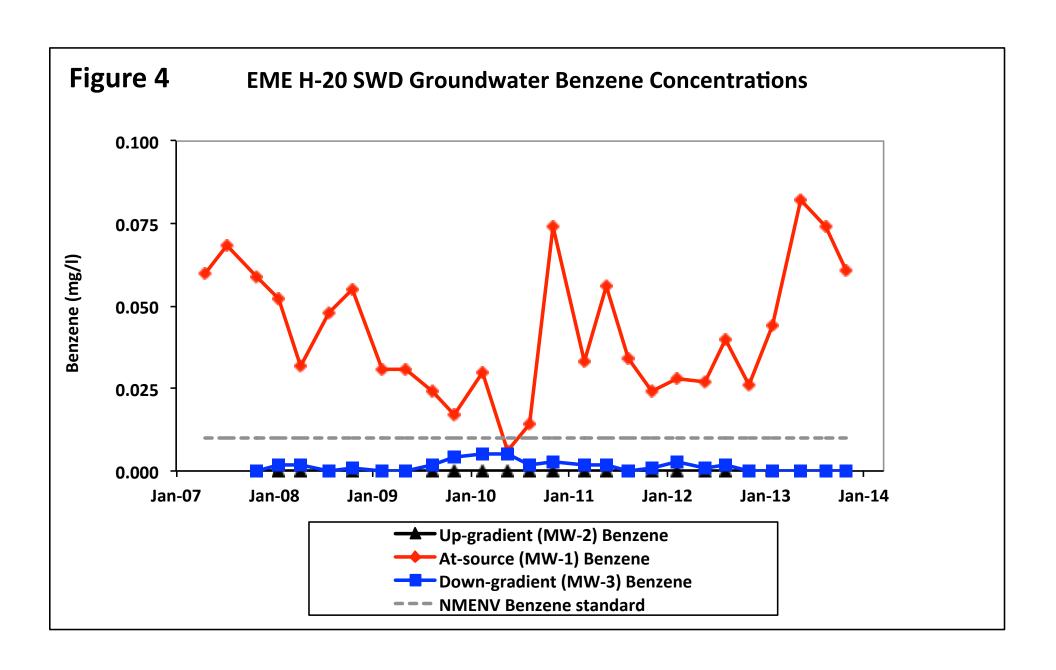


Table 2

EME H-20 SWD Groundwater Benzene Concentrations

<u>Date</u> 4/23/07 7/12/07	<u>MW-1</u> 0.060 0.068	<u>MW-2</u>	<u>MW-3</u>	<u>MW-4</u>	<u>MW-5</u>
11/1/07	0.066	<0.002	<0.002		
1/18/08	0.059	<0.002	0.002		
4/9/08	0.032	<0.001	0.002		
7/21/08	0.032	<0.001	<0.002	<0.002	<0.002
10/20/08	0.055	<0.002	0.002	<0.002	<0.002
2/5/09	0.033	<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	0.001	<0.001	<0.001
11/4/09	0.024	<0.001	0.002	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				



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/ga/lab accredited accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab accredited a

Cardinal Laboratories is accreditated 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.

Celey D. Keene

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: 11/06/2013 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)

BTEX 8021B	mg/	L	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.061	0.061 0.001 11		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*	al Xylenes* <0.003 0.003			ND	0.085	113	0.0750	0.408	
Total BTEX	0.061	0.006	11/10/2013	ND					
Surrogate: 4-Bromofluorobenzene (PID	107 9	% 89.5-12	6						
Chloride, SM4500CI-B	mg/	L	Analyze	d 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	Analyze	d 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	Analyze	d 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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10/31/2013

Cool & Intact

Jodi Henson

Water



Analytical Results For:

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

Fax To: (575) 397-1471

Received:11/06/2013Sampling Date:Reported:11/11/2013Sampling Type:Project Name:EME JUNCTION H-20Sampling Condition:Project Number:NONE GIVENSample Received By:

Project Location: T20S-R37E-SEC20 H-LEA CTY, NM

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

BTEX 8021B	mg/	L	Analyze	d 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 0.001 11,		ND	0.028	114	0.0250	0.884	
Ethylbenzene*	< 0.001	<0.001 0.001 11/		ND	0.029	115	0.0250	0.680	
Total Xylenes*	< 0.003	<0.003 0.003 11/		ND	0.085	113	0.0750	0.408	
Total BTEX	<0.006	< 0.006 0.006 11/1		ND					
Surrogate: 4-Bromofluorobenzene (PID	110 %	6 89.5-12	6						
Chloride, SM4500CI-B	mg/	L	Analyze	d 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	Analyze	d 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	Analyze	d 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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10/31/2013

Cool & Intact

Jodi Henson

Water



Analytical Results For:

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

Fax To: (575) 397-1471

Sampling Date:

Sampling Type:

Sampling Condition:

Sample Received By:

Received: 11/06/2013
Reported: 11/11/2013
Project Name: EME JUNCTION H-20
Project Number: NONE GIVEN

T20S-R37E-SEC20 H-LEA CTY, NM

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

Project Location:

BTEX 8021B	mg/	L	Analyze	d 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 0.001		ND	0.028	114	0.0250	0.884	
Ethylbenzene*	< 0.001	<0.001 0.001 1		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 %	6 89.5-12	6						
Chloride, SM4500CI-B	mg/	L	Analyze	d 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	Analyze	d 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	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3540	5.00	11/08/2013	11/08/2013 ND		107	240	5.84	

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Analytical Results For:

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

Fax To: (575) 397-1471

10/31/2013 Received: 11/06/2013 Sampling Date: Reported: 11/11/2013 Sampling Type: Water Project Name: **EME JUNCTION H-20** Sampling Condition: Cool & Intact Project Number: Sample Received By: Jodi Henson NONE GIVEN

Project Location: T20S-R37E-SEC20 H-LEA CTY, NM

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

BTEX 8021B	mg/	L	Analyze	d 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 0.001 11/		ND	0.028	114	0.0250	0.884	
Ethylbenzene*	< 0.001	<0.001 0.001 11/		ND	0.029	115	0.0250	0.680	
Total Xylenes*	< 0.003	<0.003 0.003 11/		ND	0.085	113	0.0750	0.408	
Total BTEX	<0.006	<0.006 0.006 11/1		ND					
Surrogate: 4-Bromofluorobenzene (PID	113 %	6 89.5-12	6						
Chloride, SM4500CI-B	mg/	L	Analyze	d 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	Analyze	d 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	Analyze	d 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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10/31/2013

Cool & Intact

Jodi Henson

Water



Analytical Results For:

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

Fax To: (575) 397-1471

Received:11/06/2013Sampling Date:Reported:11/11/2013Sampling Type:Project Name:EME JUNCTION H-20Sampling Condition:Project Number:NONE GIVENSample Received By:

Project Location: T20S-R37E-SEC20 H-LEA CTY, NM

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

BTEX 8021B	mg/	L	Analyze	d 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 0.001 11,		ND	0.028	114	0.0250	0.884	
Ethylbenzene*	< 0.001	<0.001 0.001 11/		ND	0.029	115	0.0250	0.680	
Total Xylenes*	< 0.003	<0.003 0.003 11/		ND	0.085	113	0.0750	0.408	
Total BTEX	<0.006	< 0.006 0.006 11/1		ND					
Surrogate: 4-Bromofluorobenzene (PID	110 %	6 89.5-12	6						
Chloride, SM4500CI-B	mg/	L	Analyze	d 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	Analyze	d 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	Analyze	d 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

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

Cardinal Laboratories *=Accredited Analyte

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