

## L Peter Galusky, Jr PE

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5935 Exeter Cir Norcross, GA | 470 955-5335 | [peter@bluerock.pro](mailto:peter@bluerock.pro)

April 1, 2021

### **Bradford Billings**

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

RE: **2020 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

Mr. Billings:

This letter summarizes progress made over the past year pursuant to the NMOCD approved Corrective Action Plan for this site. An active SWD produced water disposal facility is operated at this location by Rice Operating Company (ROC). This project is located in the EME field approximately 4 miles south of Monument, New Mexico (Appendix, Figure 1). Over the course of 2020 we continued to monitor up and down-gradient monitor wells (Appendix, Figure 2) for chlorides and petroleum hydrocarbons (BTEX).

In brief:

Average annual groundwater chloride concentrations are given in the Appendix, Figure 3, and Table 1. Year average groundwater chloride concentrations in the near-source monitor well (MW-1) decreased from 1,015 mg/l in 2019 to 980 mg/l in 2020. Year average groundwater chloride concentrations in the up-gradient monitor well (MW-2) decreased from 913 mg/l in 2019 to 800 mg/l in 2020. Year average groundwater chlorides in the down-gradient monitor well (MW-3) dropped from 1,093 mg/l in 2019 to 1,020 mg/l in 2020. Year average groundwater chloride concentrations in the far down-gradient monitor well (MW-4) decreased from 1,298 mg/l in 2019 to 1,220 mg/l in 2020. Year average groundwater chloride concentrations in the east side-gradient monitor well (MW-5) dropped from 1,175 mg/l in 2019 to 1,035mg/l in 2020.

Average annual groundwater benzene concentrations are given in the Appendix, Figure 4, and Table 2. Yearly average groundwater benzene concentrations in the near-source monitor well (MW-1) dropped from 0.0215 mg/l in 2019 to 0.0155 mg/l in 2020. Year average benzene concentrations in the up-gradient

**Rice Operating Company EME H-20 SWD Annual Report**

monitor well (MW-2) has remained at the laboratory limit of detection of 0.0010 mg/l from 2018 through 2020. Year average benzene concentrations in the downgradient monitor well (MW-3) rose slightly from 0.0245 mg/l in 2019 to 0.0300 mg/l in 2020. Year average benzene concentrations in the far down-gradient monitor well (MW-4) has remained at the laboratory limit of detection of 0.0010 mg/l from 2018 through 2020, as they have in the east side/down-gradient monitor well (MW-5) from 2011 through 2020.

The full dataset for groundwater chlorides and BTEX is given in Tables 3a – 3e.

Groundwater chloride concentrations in the down and side-gradient wells continue to slowly, if unevenly, converging toward the prevailing upgradient values (roughly 900 to 1,000 mg/l). Groundwater benzene concentrations in the near and down-source monitor wells are less than half of their high values of over a decade ago, but do not yet exhibit a clear and consistent downward trend. In 2020, NMOCD granted approval to temporarily reduce the sampling interval to semi-annual. ROC will continue quarterly sampling in 2021.

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 Partners, 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,



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

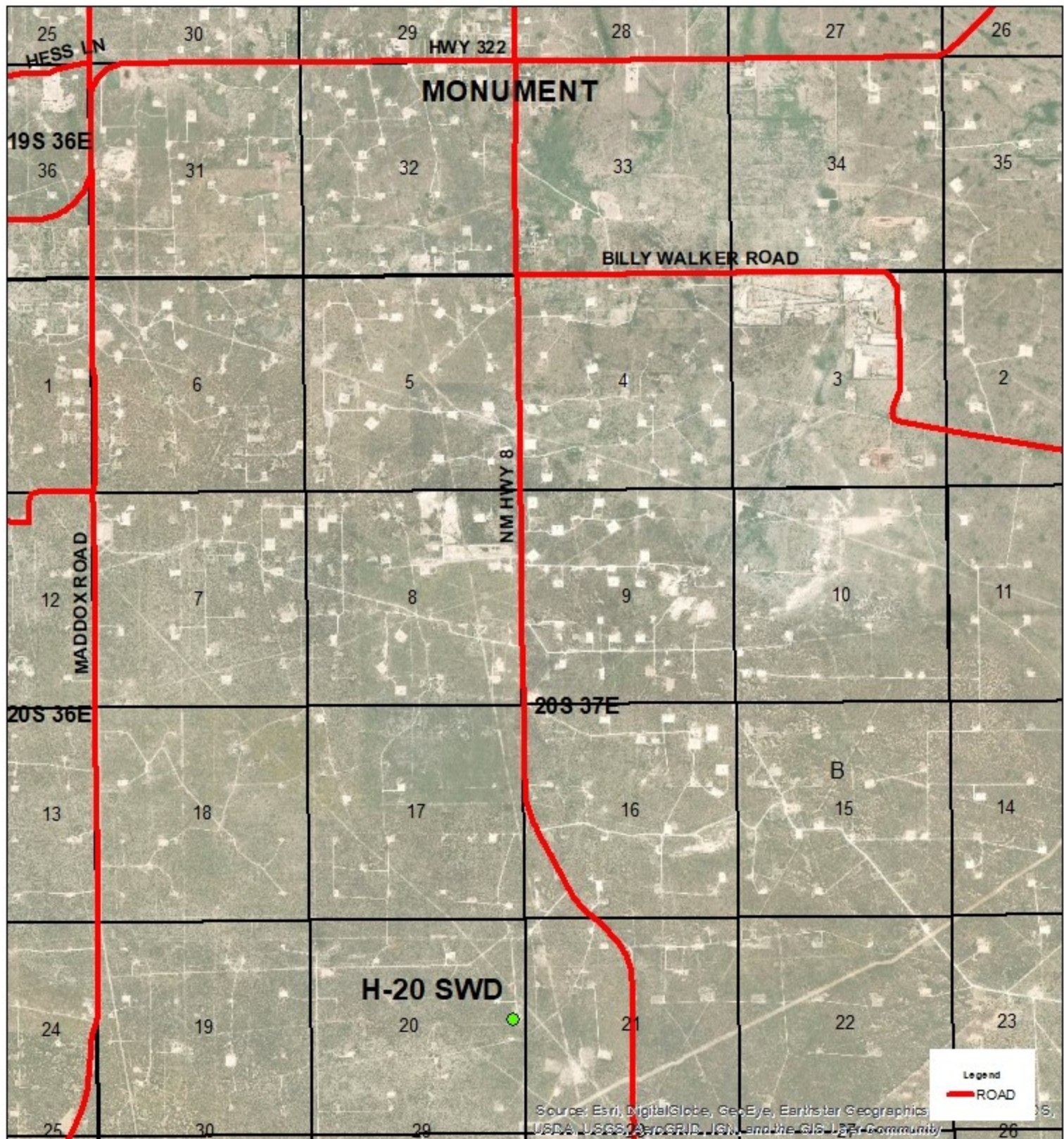


Copy: Rice Operating Company  
Attachments: ... as noted, above.

**L Peter Galusky, Jr PE**

**Page 2**





**EME**  
**H-20 SWD**  
 1R427-87

UL H SECTION 20  
 T-20-S R-37-E  
 LEA COUNTY, NM

GPS: 32.559077-103.265553  
 NAD83 STATE PLANE PROJ  
 NM EAST ZONE

0 0.5 1  
 Miles



Drawing date: 2/3/20  
 Drafted by: T. Grieco



## Site Map



**EME**  
**H-20 SWD**  
1R427-87

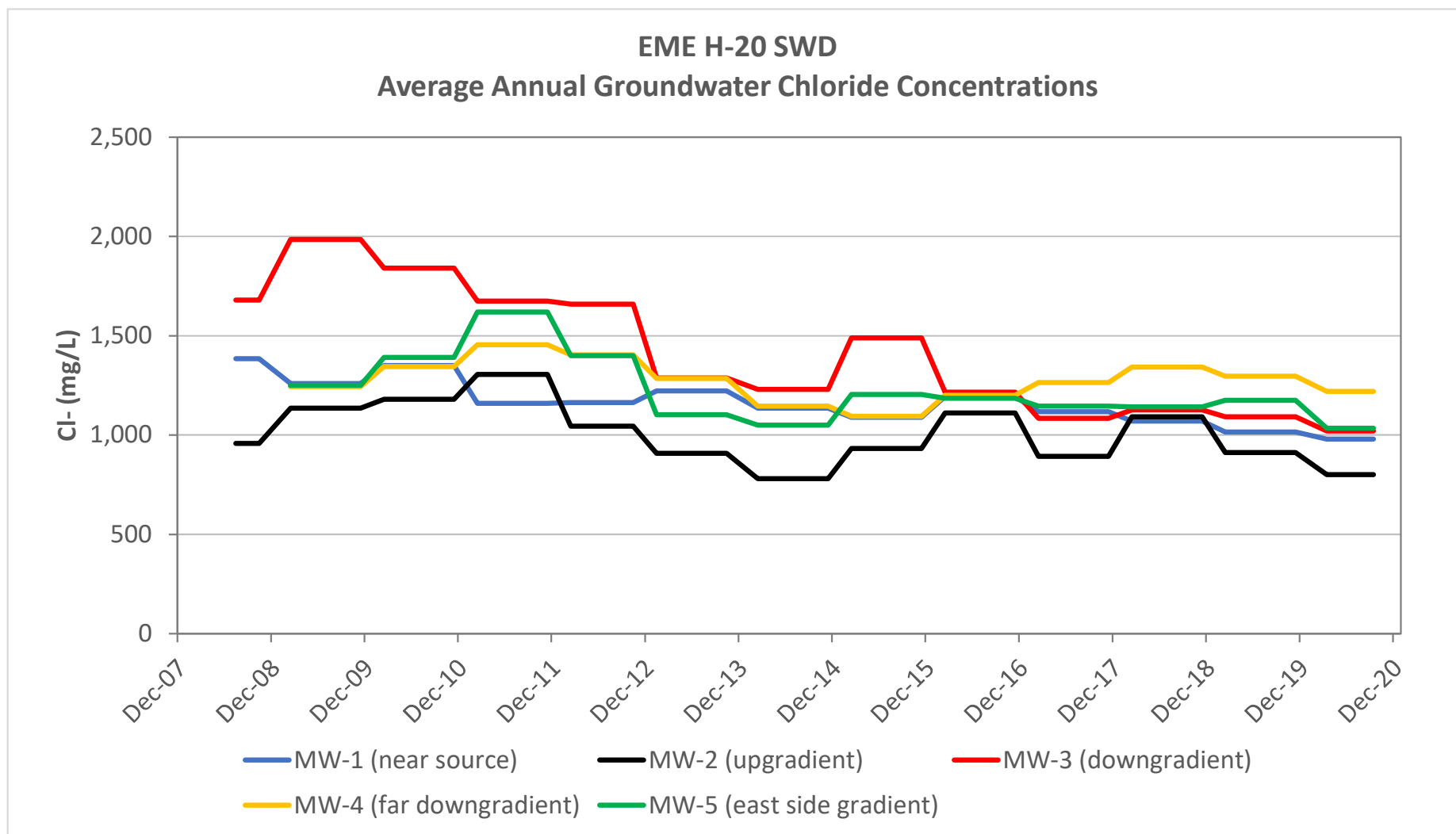
UL H SECTION 20  
T-20-S R-37-E  
LEA COUNTY, NM

GPS: 32.559077-103.265553  
NAD83 STATE PLANE PROJ  
NM EAST ZONE

0 25 50  
Feet

Drawing date: 2/3/20  
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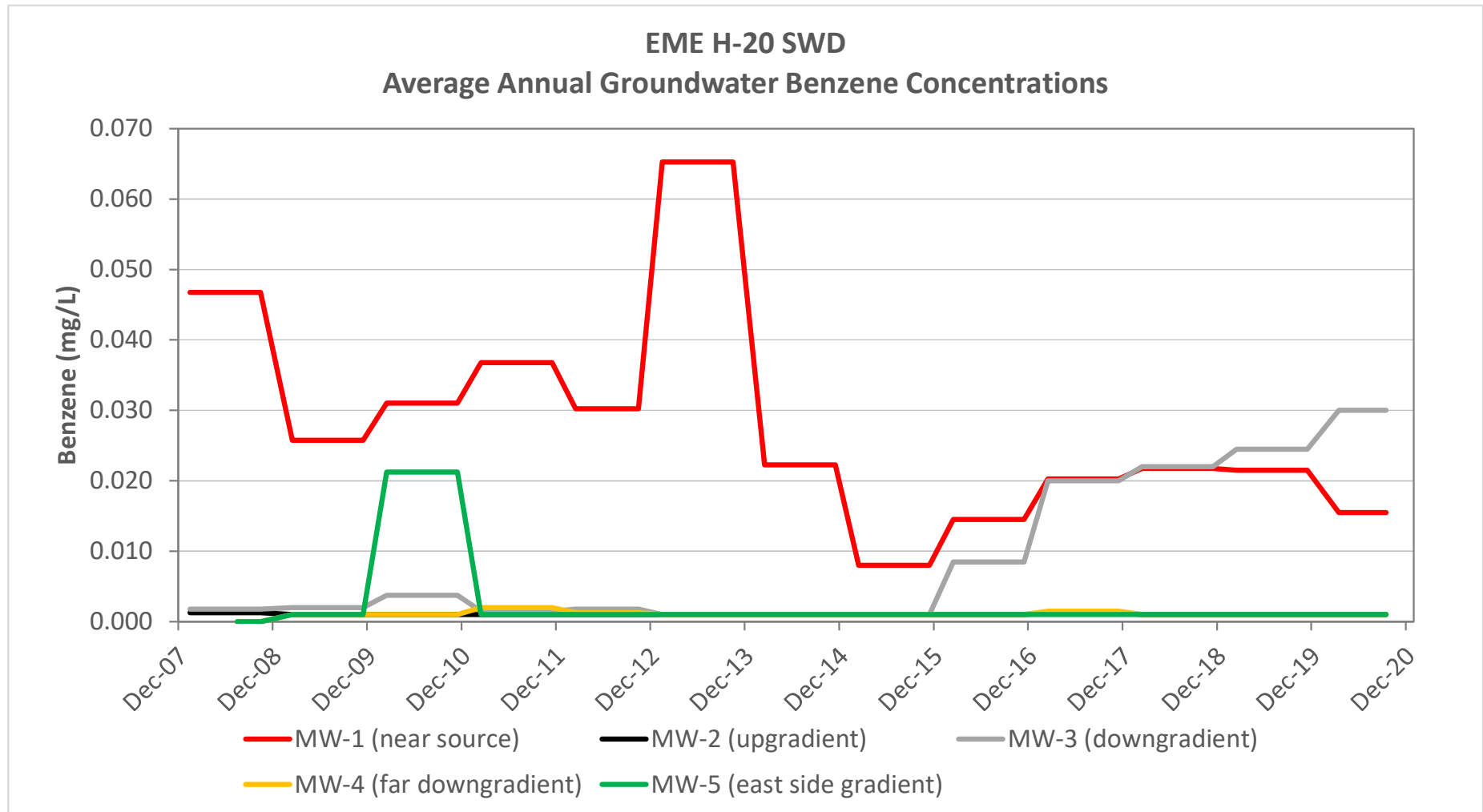




## EME H-20 SWD Groundwater Chloride Concentrations

Sample Date	MW-1 (near source)		MW-2 (upgradient)		MW-3 (downgradient)		MW-4 (far downgradient)		MW-5 (east side gradient)	
	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)
4/23/2007	1,939									
7/12/2007	1,230									
11/1/2007	1,260		1,100		1,710					
1/18/2008	1,420	1,385	980	958	1,420	1,680				
4/9/2008	1,380	1,385	840	958	1,220	1,680				
7/21/2008	1,440	1,385	1,000	958	2,140	1,680	1,300		1,400	
10/20/2008	1,300	1,385	1,010	958	1,940	1,680	1,120		1,220	
2/5/2009	1,360	1,260	1,080	1,135	1,480	1,985	1,200	1,245	1,180	1,250
5/8/2009	1,220	1,260	1,120	1,135	1,840	1,985	1,340	1,245	1,320	1,250
8/14/2009	1,180	1,260	1,140	1,135	2,570	1,985	1,240	1,245	1,240	1,250
11/4/2009	1,280	1,260	1,200	1,135	2,050	1,985	1,200	1,245	1,260	1,250
2/17/2010	1,360	1,350	1,080	1,180	1,420	1,840	1,380	1,345	1,260	1,390
5/19/2010	1,280	1,350	1,180	1,180	1,640	1,840	1,340	1,345	1,340	1,390
8/11/2010	1,460	1,350	1,120	1,180	2,150	1,840	1,380	1,345	1,400	1,390
11/4/2010	1,300	1,350	1,340	1,180	2,150	1,840	1,280	1,345	1,560	1,390
2/25/2011	1,160	1,160	1,680	1,305	1,580	1,675	1,440	1,455	1,600	1,620
5/20/2011	1,220	1,160	1,120	1,305	1,880	1,675	1,500	1,455	1,680	1,620
8/11/2011	1,080	1,160	1,140	1,305	1,580	1,675	1,400	1,455	1,600	1,620
11/9/2011	1,180	1,160	1,280	1,305	1,660	1,675	1,480	1,455	1,600	1,620
2/8/2012	1,170	1,163	1,060	1,045	1,480	1,660	1,500	1,405	1,560	1,400
5/20/2012	1,100	1,163	1,040	1,045	1,400	1,660	1,360	1,405	1,480	1,400
8/7/2012	1,160	1,163	1,020	1,045	1,920	1,660	1,360	1,405	1,320	1,400
10/31/2012	1,220	1,163	1,060	1,045	1,840	1,660	1,400	1,405	1,240	1,400
1/30/2013	1,180	1,223	1,040	908	1,240	1,288	1,220	1,285	1,140	1,103
5/14/2013	1,230	1,223	960	908	1,250	1,288	1,340	1,285	1,200	1,103
8/14/2013	1,360	1,223	860	908	1,580	1,288	1,400	1,285	1,070	1,103
10/31/2013	1,120	1,223	770	908	1,080	1,288	1,180	1,285	1,000	1,103
2/18/2014	1,100	1,135	740	780	1,040	1,230	1,200	1,145	1,000	1,050
4/24/2014	1,080	1,135	830	780	1,020	1,230	1,240	1,145	1,060	1,050
7/31/2014	1,060	1,135	730	780	1,080	1,230	1,220	1,145	1,040	1,050
11/6/2014	1,300	1,135	820	780	1,780	1,230	920	1,145	1,100	1,050
2/12/2015	1,030	1,090	950	932	1,520	1,490	1,080	1,095	1,040	1,205
5/6/2015	1,120	1,090	860	932	1,260	1,490	1,040	1,095	1,200	1,205
8/11/2015	1,090	1,090	939	932	1,660	1,490	1,120	1,095	1,220	1,205
11/5/2015	1,120	1,090	980	932	1,520	1,490	1,140	1,095	1,360	1,205
2/10/2016	1,040	1,195	1,160	1,110	1,280	1,215	1,080	1,200	1,240	1,185
5/9/2016	1,300	1,195	1,160	1,110	1,380	1,215	1,140	1,200	1,080	1,185
9/8/2016	1,200	1,195	1,160	1,110	1,060	1,215	1,260	1,200	1,120	1,185
11/8/2016	1,240	1,195	960	1,110	1,140	1,215	1,320	1,200	1,300	1,185
2/16/2017	1,240	1,118	920	893	1,140	1,085	1,160	1,265	1,180	1,145
4/28/2017	1,040	1,118	900	893	1,108	1,085	1,200	1,265	1,180	1,145
9/5/2017	1,200	1,118	920	893	1,060	1,085	1,340	1,265	1,160	1,145
11/8/2017	990	1,118	830	893	1,030	1,085	1,360	1,265	1,060	1,145
2/23/2018	1,040	1,070	1,070	1,093	990	1,128	1,170	1,343	1,060	1,143
5/8/2018	1,240	1,070	1,240	1,093	1,340	1,128	1,500	1,343	1,230	1,143
8/30/2018	1,020	1,070	1,080	1,093	1,080	1,128	1,460	1,343	1,140	1,143
11/8/2018	980	1,070	980	1,093	1,100	1,128	1,240	1,343	1,140	1,143
2/27/2019	1,080	1,015	950	913	1,200	1,093	1,400	1,298	1,280	1,175
5/22/2019	990	1,015	1,000	913	1,090	1,093	1,230	1,298	1,280	1,175
8/26/2019	930	1,015	870	913	1,040	1,093	1,240	1,298	1,100	1,175
11/13/2019	1,060	1,015	830	913	1,040	1,093	1,320	1,298	1,040	1,175
3/2/2020	1,000	980	800	800	1,060	1,020	1,220	1,220	1,090	1,035
9/8/2020	960	980	800	800	980	1,020	1,220	1,220	980	1,035





## EME H-20 SWD Groundwater Benzene Concentrations

Sample Date	MW-1 (near source)		MW-2 (upgradient)		MW-3 (downgradient)		MW-4 (far downgradient)		MW-5 (east side gradient)	
	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)	Measured Value (mg/l)	Calendar Yr Avg (mg/l)
4/23/2007	0.0600									
7/12/2007	0.0684									
11/1/2007	0.0590		0.0020		0.0020					
1/18/2008	0.0520	0.0468	0.0010	0.0013	0.0020	0.0018				
4/9/2008	0.0320	0.0468	0.0010	0.0013	0.0020	0.0018				
7/21/2008	0.0480	0.0468	0.0020	0.0013	0.0020	0.0018	0.0020	0.0000	0.0020	0.0000
10/20/2008	0.0550	0.0468	0.0010	0.0013	0.0010	0.0018	0.0010	0.0000	0.0010	0.0000
2/5/2009	0.0310	0.0258	0.0010	0.0010	0.0010	0.0020	0.0010	0.0010	0.0010	0.0010
5/8/2009	0.0310	0.0258	0.0010	0.0010	0.0010	0.0020	0.0010	0.0010	0.0010	0.0010
8/14/2009	0.0240	0.0258	0.0010	0.0010	0.0020	0.0020	0.0010	0.0010	0.0010	0.0010
11/4/2009	0.0170	0.0258	0.0010	0.0010	0.0040	0.0020	0.0010	0.0010	0.0010	0.0010
2/17/2010	0.0300	0.0310	0.0010	0.0010	0.0050	0.0038	0.0010	0.0010	0.0010	0.0213
5/19/2010	0.0060	0.0310	0.0010	0.0010	0.0050	0.0038	0.0010	0.0010	0.0010	0.0213
8/11/2010	0.0140	0.0310	0.0010	0.0010	0.0020	0.0038	0.0010	0.0010	0.0010	0.0213
11/4/2010	0.0740	0.0310	0.0010	0.0010	0.0030	0.0038	0.0010	0.0010	0.0820	0.0213
2/25/2011	0.0330	0.0368	0.0010	0.0010	0.0020	0.0015	0.0010	0.0020	0.0010	0.0010
5/20/2011	0.0560	0.0368	0.0010	0.0010	0.0020	0.0015	0.0010	0.0020	0.0010	0.0010
8/11/2011	0.0340	0.0368	0.0010	0.0010	0.0010	0.0015	0.0040	0.0020	0.0010	0.0010
11/9/2011	0.0240	0.0368	0.0010	0.0010	0.0010	0.0015	0.0020	0.0020	0.0010	0.0010
2/8/2012	0.0280	0.0303	0.0010	0.0010	0.0030	0.0018	0.0020	0.0013	0.0010	0.0010
5/20/2012	0.0270	0.0303	0.0010	0.0010	0.0010	0.0018	0.0010	0.0013	0.0010	0.0010
8/7/2012	0.0400	0.0303	0.0010	0.0010	0.0020	0.0018	0.0010	0.0013	0.0010	0.0010
10/31/2012	0.0260	0.0303	0.0010	0.0010	0.0010	0.0018	0.0010	0.0013	0.0010	0.0010
1/30/2013	0.0440	0.0653	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
5/14/2013	0.0820	0.0653	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
8/14/2013	0.0740	0.0653	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
10/31/2013	0.0610	0.0653	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
2/18/2014	0.0380	0.0223	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
4/24/2014	0.0370	0.0223	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
7/31/2014	0.0130	0.0223	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
11/6/2014	0.0010	0.0223	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
2/12/2015	0.0290	0.0080	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
5/6/2015	0.0010	0.0080	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
8/11/2015	0.0010	0.0080	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
11/5/2015	0.0010	0.0080	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
2/10/2016	0.0240	0.0145	0.0010	0.0010	0.0010	0.0085	0.0010	0.0010	0.0010	0.0010
5/9/2016	0.0010	0.0145	0.0010	0.0010	0.0010	0.0085	0.0010	0.0010	0.0010	0.0010
9/8/2016	0.0100	0.0145	0.0010	0.0010	0.0060	0.0085	0.0010	0.0010	0.0010	0.0010
11/8/2016	0.0230	0.0145	0.0010	0.0010	0.0260	0.0085	0.0010	0.0010	0.0010	0.0010
2/16/2017	0.0010	0.0203	0.0010	0.0013	0.0010	0.0200	0.0010	0.0015	0.0010	0.0010
4/28/2017	0.0140	0.0203	0.0010	0.0013	0.0230	0.0200	0.0010	0.0015	0.0010	0.0010
9/5/2017	0.0370	0.0203	0.0010	0.0013	0.0410	0.0200	0.0010	0.0015	0.0010	0.0010
11/8/2017	0.0290	0.0203	0.0020	0.0013	0.0150	0.0200	0.0030	0.0015	0.0010	0.0010
2/23/2018	0.0180	0.0218	0.0010	0.0010	0.0180	0.0220	0.0010	0.0010	0.0010	0.0010
5/8/2018	0.0010	0.0218	0.0010	0.0010	0.0010	0.0220	0.0010	0.0010	0.0010	0.0010
8/30/2018	0.0360	0.0218	0.0010	0.0010	0.0340	0.0220	0.0010	0.0010	0.0010	0.0010
11/8/2018	0.0320	0.0218	0.0010	0.0010	0.0350	0.0220	0.0010	0.0010	0.0010	0.0010
2/27/2019	0.0020	0.0215	0.0010	0.0010	0.0070	0.0245	0.0010	0.0010	0.0010	0.0010
5/22/2019	0.0190	0.0215	0.0010	0.0010	0.0060	0.0245	0.0010	0.0010	0.0010	0.0010
8/26/2019	0.0430	0.0215	0.0010	0.0010	0.0680	0.0245	0.0010	0.0010	0.0010	0.0010
11/13/2019	0.0220	0.0215	0.0010	0.0010	0.0170	0.0245	0.0010	0.0010	0.0010	0.0010
3/2/2020	0.0010	0.0155	0.0010	0.0010	0.0020	0.0300	0.0010	0.0010	0.0010	0.0010
9/8/2020	0.0300	0.0155	0.0010	0.0010	0.0580	0.0300	0.0010	0.0010	0.0010	0.0010



## EME H-20 SWD Groundwater Data

MW	Depth to Water (ft)	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
1	22.9	35.0	7.8	25.0	4/23/2007	1,939	4,343	0.060	<0.002	<0.002	<0.006	544	Clear
1	23.5	35.0	7.5	25.0	7/12/2007	1,230	3,660	0.068	<0.005	0.016	<0.002	644	Clear
1	23.5	35.0	7.4	25.0	11/1/2007	1,260	3,824	0.059	<0.002	0.006	<0.006	612	Gray to clear Strong odor 0.16 inches of product in well
1	23.4	35.0	7.5	25.0	1/18/2008	1,420	3,896	0.052	<0.005	<0.005	<0.015	653	Hydrocarbon present Gray to clear with strong odor
1	23.3	35.0	7.6	25.0	4/9/2008	1,380	3,890	0.032	0.001	0.004	<0.003	862	Gray to clear Strong odor Hydrocarbon present
1	24.0	35.0	7.1	25.0	7/21/2008	1,440	4,070	0.048	<0.020	<0.020	<0.06	794	Hydrocarbon present Gray to clear Strong odor
1	23.5	35.0	7.4	25.0	10/20/2008	1,300	3,920	0.055	0.002	0.004	<0.003	744	Hydrocarbon present Gray to clear Strong odor
1	23.2	35.0	7.6	25.0	2/5/2009	1,360	3,900	0.031	0.001	0.004	<0.003	753	Hydrocarbon present Gray to clear Strong odor
1	23.1	35.0	7.7	25.0	5/8/2009	1,220	3,850	0.031	<0.001	<0.001	<0.003	746	Hydrocarbon present Gray to clear Strong odor
1	24.1	35.0	7.0	25.0	8/14/2009	1,180	3,690	0.024	<0.001	0.007	<0.003	694	Hydrocarbon present Gray to clear Strong odor
1	24.3	35.0	6.9	25.0	11/4/2009	1,280	3,840	0.017	<0.001	0.002	<0.003	631	Hydrocarbon present Gray to clear Strong odor
1	23.8	35.0	7.2	25.0	2/17/2010	1,360	3,800	0.030	<0.001	0.004	<0.003	946	Gray to Clear with Strong Odor
1	23.4	35.0	7.5	25.0	5/19/2010	1,280	3,950	0.006	<0.001	<0.001	<0.003	760	Hydrocarbon sheen Gray to clear Strong odor
1	23.1	35.0	7.7	25.0	8/11/2010	1,460	4,050	0.014	<0.001	0.003	<0.003	740	Hydrocarbon sheen Gray to clear Strong odor
1	23.6	35.0	7.4	25.0	11/4/2010	1,300	3,910	0.074	<0.002	0.004	<0.006	645	Hydrocarbon sheen Gray to clear Strong odor
1	23.3	35.0	7.6	25.0	2/25/2011	1,160	3,800	0.033	0.002	0.004	0.003	756	Hydrocarbon sheen gray to clear with strong odor
1	23.5	35.0	7.4	25.0	5/20/2011	1,220	3,700	0.056	0.003	0.006	0.007	761	Hydrocarbon sheen gray to clear with strong odor

1	24.4	35.0	6.8	25.0	8/11/2011	1,080	3,640	0.034	<0.001	0.002	<0.003	779	Hydrocarbon sheen Gray to clear Strong odor
1	24.2	35.0	7.0	25.0	11/9/2011	1,180	3,580	0.024	<0.001	0.002	<0.003	827	Hydrocarbon sheen Gray to clear Strong odor
1	23.8	35.0	7.2	25.0	2/8/2012	1,170	3,650	0.028	<0.001	0.003	<0.003	807	Hydrocarbon sheen Gray to clear Strong odor
1	23.7	35.0	7.3	25.0	5/20/2012	1,100	3,500	0.027	<0.001	0.004	<0.003	639	Hydrocarbon sheen Gray to clear Strong odor
1	24.3	35.0	6.9	25.0	8/7/2012	1,160	3,660	0.040	0.002	0.008	<0.003	727	Hydrocarbon sheen Gray to clear Strong odor
1	24.1	35.0	7.1	25.0	10/31/2012	1,220	3,720	0.026	<0.001	<0.001	<0.003	686	Hydrocarbon sheen Gray to clear Strong odor
1	23.9	35.0	7.2	25.0	1/30/2013	1,180	3,750	0.044	<0.001	0.004	<0.003	547	Hydrocarbon sheen Gray to clear Strong odor
1	23.8	35.0	7.3	25.0	5/14/2013	1,230	3,860	0.082	0.002	0.008	<0.003	842	Hydrocarbon sheen Gray to clear Strong odor
1	24.2	35.0	7.0	25.0	8/14/2013	1,360	3,820	0.074	0.003	0.013	<0.003	788	Hydrocarbon sheen Gray to clear Strong odor
1	24.3	35.0	6.9	25.0	10/31/2013	1,120	3,830	0.061	<0.001	<0.001	<0.003	832	Hydrocarbon sheen Gray to clear Strong odor
1	23.9	35.0	7.2	25.0	2/18/2014	1,100	3,720	0.038	<0.001	0.003	<0.003	815	Hydrocarbon sheen Gray to clear Strong odor
1	23.8	35.0	7.3	25.0	4/24/2014	1,080	3,760	0.037	<0.001	0.003	<0.003	785	Hydrocarbon sheen Gray to clear Strong odor
1	24.7	35.0	6.6	25.0	7/31/2014	1,060	3,510	0.013	<0.001	0.002	<0.003	626	Hydrocarbon sheen Gray to clear Strong odor
1	24.7	35.0	6.7	25.0	11/6/2014	1,300	4,340	<0.001	<0.001	<0.001	<0.003	983	Hydrocarbon sheen Gray to clear Strong odor PSH Sock Changed
1	23.5	35.0	7.4	25.0	2/12/2015	1,030	3,500	0.029	<0.001	0.001	<0.003	789	Hydrocarbon sheen Gray to clear Strong odor PSH Sock Changed
1	23.2	35.0	7.6	25.0	5/6/2015	1,120	3,790	<0.001	<0.001	<0.001	<0.003	812	Hydrocarbon sheen Gray to clear Strong odor
1	23.8	35.0	7.2	25.0	8/11/2015	1,090	4,120	<0.001	<0.001	<0.001	<0.003	759	Hydrocarbon sheen Gray to clear Strong odor

1	23.6	35.0	7.4	25.0	11/5/2015	1,120	3,790	<0.001	<0.001	<0.001	<0.003	728	Hydrocarbon sheen
1	23.2	35.0	7.6	25.0	2/10/2016	1,040	3,690	0.024	<0.001	<0.001	<0.003	746	Hydrocarbon sheen Gray to clear Strong odor
1	23.0	35.0	7.8	25.0	5/9/2016	1,300	3,880	<0.001	<0.001	<0.001	<0.003	768	Hydrocarbon sheen Gray to clear Strong odor
1	23.7	35.0	7.3	25.0	9/8/2016	1,200	3,560	0.010	<0.001	0.001	0.012	830	Hydrocarbon sheen Gray to clear Strong odor
1	23.2	35.0	7.6	25.0	11/8/2016	1,240	3,620	0.023	0.004	0.003	0.030	819	Hydrocarbon sheen Gray to clear Strong odor
1	23.0	39.0	7.8	25.0	2/16/2017	1,240	3,690	0.001	<0.001	<0.001	<0.003	888	Hydrocarbon sheen Gray to clear Strong odor
1	22.7	39.0	7.9	25.0	4/28/2017	1,040	3,520	0.014	<0.001	0.002	<0.003	884	Hydrocarbon sheen Gray to clear Strong odor
1	23.4	39.0	7.9	25.0	9/5/2017	1,200	3,890	0.037	<0.001	0.007	<0.003	865	Hydrocarbon sheen Gray to clear Strong odor
1	23.4	39.0	7.9	25.0	11/8/2017	990	3,560	0.029	<0.001	0.005	<0.003	840	Hydrocarbon sheen Gray to clear Strong odor
1	22.8	35.0	7.9	25.0	2/23/2018	1,040	3,220	0.018	<0.001	0.003	<0.003	847	Hydrocarbon sheen Gray to clear Strong odor
1	23.0	35.0	7.8	25.0	5/8/2018	1,240	3,780	<0.001	<0.001	<0.001	<0.003	945	Hydrocarbon sheen Gray to clear Strong odor
1	24.2	35.0	7.0	25.0	8/30/2018	1,020	3,400	0.036	<0.001	0.006	<0.003	804	Hydrocarbon sheen Gray to clear Strong odor
1	23.6	35.0	7.4	25.0	11/8/2018	980	3,060	0.032	0.001	0.005	<0.003	980	Hydrocarbon sheen Gray to clear Strong odor
1	23.1	39.0	7.7	25.0	2/27/2019	1,080	3,100	0.002	<0.001	<0.001	<0.003	1,000	Hydrocarbon sheen Gray to clear Strong odor
1	23.1	39.0	7.7	25.0	5/22/2019	990	3,430	0.019	<0.001	<0.001	<0.003	836	Hydrocarbon sheen Gray to clear Strong odor
1	24.0	39.0	7.1	25.0	8/26/2019	930	3,360	0.043	<0.001	0.006	<0.003	1,090	Hydrocarbon sheen Gray to clear Strong odor
1	23.3	39.0	7.6	25.0	11/13/2019	1,060	3,490	0.022	<0.001	0.004	<0.003	681	Hydrocarbon sheen Gray to clear Strong odor
1	23.2	35.0	7.6	25	3/2/2020	1,000	3,420	0.001	<0.001	<0.001	<0.003	1,500	Hydrocarbon sheen Gray to clear Strong odor



1	24.5	35.0	6.8	25	9/8/2020	960	3,330	0.030	<0.001	0.005	<0.003	489	Hydrocarbon sheen Gray to clear Strong odor
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## EME H-20 SWD Groundwater Data

MW	Depth to Water (ft)	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
2	24.1	33.0	1.4	5.0	11/1/2007	1,100	3,664	<0.002	<0.002	<0.002	<0.006	849	Clear Slight odor
2	23.9	33.4	1.5	5.0	1/18/2008	980	3,205	<0.001	<0.001	<0.001	<0.003	746	Clear Slight odor
2	23.8	33.4	1.5	5.0	4/9/2008	840	2,990	<0.001	<0.001	<0.001	<0.003	988	Clear Slight odor
2	24.6	33.4	1.4	5.0	7/21/2008	1,000	3,210	<0.002	<0.002	<0.002	<0.006	796	Clear Slight odor
2	24.3	33.4	1.5	5.0	10/20/2008	1,010	3,270	<0.001	<0.001	<0.001	<0.003	762	Clear Slight odor
2	24.0	33.5	1.5	5.0	2/5/2009	1,080	3,510	<0.001	<0.001	<0.001	<0.003	815	Clear Slight odor
2	23.9	33.5	1.5	5.0	5/8/2009	1,120	3,480	<0.001	<0.001	<0.001	<0.003	772	Clear Slight odor
2	24.8	33.5	1.4	5.0	8/14/2009	1,140	3,550	<0.001	<0.001	<0.001	<0.003	750	Clear Slight odor
2	25.0	33.5	1.4	5.0	11/4/2009	1,200	3,570	<0.001	<0.001	<0.001	<0.003	564	Clear Slight odor
2	24.5	33.5	1.4	5.0	2/17/2010	1,080	3,480	<0.001	<0.001	<0.001	<0.003	929	Clear Slight odor
2	24.1	33.5	1.5	5.0	5/19/2010	1,180	3,670	<0.001	<0.001	<0.001	<0.003	841	Clear Slight odor
2	23.9	33.5	1.5	5.0	8/11/2010	1,120	3,520	<0.001	<0.001	<0.001	<0.003	783	Clear Slight odor
2	24.2	33.5	1.5	5.0	11/4/2010	1,340	4,210	<0.001	<0.001	<0.001	<0.003	1020	Clear Slight odor
2	23.9	33.5	1.5	6.0	2/25/2011	1,680	3,390	<0.001	<0.001	<0.001	<0.003	761	Clear Slight odor
2	24.1	33.5	1.5	6.0	5/20/2011	1,120	3,360	<0.001	<0.001	<0.001	<0.003	724	Clear Slight odor
2	24.9	33.5	1.4	6.0	8/11/2011	1,140	3,470	<0.001	<0.001	<0.001	<0.003	845	Clear Slight odor
2	24.4	33.5	1.4	6.0	11/9/2011	1,280	3,680	<0.001	<0.001	<0.001	<0.003	788	Clear Slight odor
2	24.5	33.5	1.4	6.0	2/8/2012	1,060	3,290	<0.001	<0.001	<0.001	<0.003	702	Clear Slight odor
2	24.3	33.5	1.5	6.0	5/20/2012	1,040	3,270	<0.001	<0.001	<0.001	<0.003	695	Clear Slight odor
2	24.9	33.5	1.4	6.0	8/7/2012	1,020	3,230	<0.001	<0.001	<0.001	<0.003	749	Clear Slight odor
2	24.8	33.5	1.4	6.0	10/31/2012	1,060	3,300	<0.001	<0.001	<0.001	<0.003	692	Clear Slight odor
2	24.5	33.5	1.4	6.0	1/30/2013	1,040	3,220	<0.001	<0.001	<0.001	<0.003	626	Clear Slight odor
2	24.3	33.5	1.5	6.0	5/15/2013	960	3,230	<0.001	<0.001	<0.001	<0.003	874	Clear Slight odor
2	24.8	33.5	1.4	6.0	8/14/2013	860	3,010	<0.001	<0.001	<0.001	<0.003	668	Clear Slight odor
2	24.9	33.5	1.4	6.0	10/31/2013	770	2,900	<0.001	<0.001	<0.001	<0.003	670	Clear Slight odor
2	24.5	33.5	1.4	6.0	2/18/2014	740	2,710	<0.001	<0.001	<0.001	<0.003	664	Clear Slight odor
2	24.4	33.5	1.5	6.0	4/24/2014	830	2,890	<0.001	<0.001	<0.001	<0.003	638	Clear Slight odor
2	25.3	33.5	1.3	6.0	7/31/2014	730	2,720	<0.001	<0.001	<0.001	<0.003	646	Clear Slight odor
2	24.5	33.5	1.4	6.0	11/6/2014	820	2,910	<0.001	<0.001	<0.001	<0.003	539	Clear Slight odor
2	24.3	33.5	1.5	6.0	2/12/2015	950	3,010	<0.001	<0.001	<0.001	<0.003	703	Clear Slight odor
2	24.0	33.5	1.5	6.0	5/6/2015	860	3,070	<0.001	<0.001	<0.001	<0.003	605	Clear Slight odor
2	24.6	33.5	1.4	6.0	8/11/2015	939	3,250	<0.001	<0.001	<0.001	<0.003	479	Clear Slight odor

2	24.3	33.5	1.5	6.0	11/5/2015	980	3,490	<0.001	<0.001	<0.001	<0.003	691	Clear Slight odor
2	24.0	33.5	1.5	6.0	2/10/2016	1,160	3,800	<0.001	<0.001	<0.001	<0.003	720	Clear Slight odor
2	23.8	33.5	1.6	6.0	5/9/2016	1,160	3,670	<0.001	<0.001	<0.001	<0.003	892	Clear Slight odor
2	24.4	33.5	1.5	6.0	9/8/2016	1,160	3,700	<0.001	<0.001	<0.001	<0.003	826	Clear Slight odor
2	23.9	33.5	1.5	6.0	11/8/2016	960	3,080	<0.001	<0.001	<0.001	<0.003	716	Clear Slight odor
2	23.7	33.5	1.6	6.0	2/16/2017	920	2,900	<0.001	<0.001	<0.001	<0.003	771	Clear Slight odor
2	23.5	33.5	1.6	6.0	4/28/2017	900	2,980	<0.001	<0.001	<0.001	<0.003	802	Clear Slight odor
2	24.1	33.5	1.6	6.0	9/5/2017	920	3,110	<0.001	<0.001	<0.001	<0.003	713	Clear Slight odor
2	24.0	33.5	1.6	6.0	11/8/2017	830	3,030	0.002	<0.001	<0.001	<0.003	705	Clear Slight odor
2	23.5	33.5	1.6	6.0	2/23/2018	1,070	3,110	<0.001	<0.001	<0.001	<0.003	776	Clear Slight odor
2	23.6	33.5	1.6	6.0	5/8/2018	1,240	3,780	<0.001	<0.001	<0.001	<0.003	945	Clear Slight odor
2	24.7	33.5	1.4	6.0	8/30/2018	1,080	3,370	<0.001	<0.001	<0.001	<0.003	838	Clear Slight odor
2	24.2	33.5	1.5	6.0	11/8/2018	980	2,240	<0.001	<0.001	<0.001	<0.003	926	Clear Slight odor
2	23.8	33.5	1.6	6.0	2/27/2019	950	2,700	<0.001	<0.001	<0.001	<0.003	871	Clear Slight odor
2	23.7	33.5	1.6	6.0	5/22/2019	1,000	3,220	<0.001	<0.001	<0.001	<0.003	800	Clear Slight odor
2	24.8	33.5	1.4	6.0	8/26/2019	870	2,850	<0.001	<0.001	<0.001	<0.003	1,170	Clear Slight odor
2	24.4	33.5	1.4	6.0	11/13/2019	830	2,920	<0.001	<0.001	<0.001	<0.003	670	Clear Slight odor
2	23.9	33.5	1.5	6	3/2/2020	800	2,840	<0.001	<0.001	<0.001	<0.003	885	Clear Slight odor
2	25.0	33.5	1.4	6	9/8/2020	800	2,830	<0.001	<0.001	<0.001	<0.003	545	Clear Slight odor



## EME H-20 SWD Groundwater Data

MW	Depth to Water (ft)	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
3	23.6	33.7	1.6	5.0	11/1/2007	1,710	4,827	<0.002	<0.002	<0.002	<0.006	809	Clear Strong odor
3	23.4	33.8	1.7	5.0	1/18/2008	1,420	4,175	0.002	<0.001	0.002	<0.003	670	RISER HAS BEEN HIT Clear Strong odor
3	23.8	33.8	1.6	5.0	4/9/2008	1,220	3,720	0.002	<0.001	0.002	<0.003	1070	Clear Strong odor RISER HAS BEEN REPLACED
3	24.1	33.8	1.5	5.0	7/21/2008	2,140	5,570	<0.002	<0.002	<0.002	<0.006	978	Clear Strong odor
3	23.7	33.8	1.6	6.0	10/20/2008	1,940	5,170	0.001	<0.001	<0.001	<0.003	890	Clear Strong odor
3	23.4	33.7	1.7	6.0	2/5/2009	1,480	4,330	<0.001	<0.001	<0.001	<0.003	837	Clear Strong odor
3	23.3	33.7	1.7	6.0	5/8/2009	1,840	4,800	<0.001	<0.001	<0.001	<0.003	802	Clear Strong odor
3	24.4	33.7	1.5	6.0	8/14/2009	2,570	6,580	0.002	0.001	<0.001	<0.003	1060	Clear Strong odor
3	24.5	33.7	1.5	6.0	11/4/2009	2,050	4,890	0.004	<0.001	<0.001	<0.003	804	Clear Strong odor
3	24.0	33.8	1.6	6.0	2/17/2010	1,420	4,200	0.005	<0.001	<0.001	<0.003	1050	Clear Strong odor
3	23.5	33.8	1.6	6.0	5/19/2010	1,640	4,680	0.005	<0.001	<0.001	<0.003	974	Clear Strong odor
3	23.4	33.8	1.7	6.0	8/11/2010	2,150	5,430	0.002	<0.001	<0.001	<0.003	962	Hydrocarbon sheen Clear Strong odor
3	23.8	33.8	1.6	6.0	11/4/2010	2,150	5,760	0.003	<0.001	<0.001	<0.003	1190	Hydrocarbon sheen Clear Strong odor
3	23.4	33.8	1.7	6.0	2/25/2011	1,580	4,540	0.002	<0.001	<0.001	<0.003	933	Hydrocarbon sheen Clear Strong odor
3	23.7	33.8	1.6	6.0	5/20/2011	1,880	5,050	0.002	<0.001	<0.001	<0.003	967	Hydrocarbon sheen Clear Strong odor
3	24.6	33.8	1.5	6.0	8/11/2011	1,580	4,880	<0.001	<0.001	<0.001	<0.003	870	Hydrocarbon sheen Clear Strong odor
3	24.4	33.8	1.5	6.0	11/9/2011	1,660	4,550	0.001	<0.001	0.002	<0.003	904	Hydrocarbon sheen Clear Strong odor
3	24.0	33.8	1.6	6.0	2/8/2012	1,480	4,090	0.003	<0.001	<0.001	<0.003	835	Hydrocarbon sheen Clear Strong odor
3	23.8	33.8	1.6	6.0	5/20/2012	1,400	3,890	0.001	<0.001	<0.001	<0.003	740	Hydrocarbon sheen Clear Strong odor
3	24.5	33.8	1.5	6.0	8/7/2012	1,920	5,120	0.002	0.003	0.002	<0.003	833	Hydrocarbon sheen Clear Strong odor

3	24.3	33.8	1.5	6.0	10/31/2012	1,840	4,830	<0.001	<0.001	<0.001	<0.003	913	Hydrocarbon sheen Clear Strong odor
3	24.0	33.8	1.6	6.0	1/30/2013	1,240	3,850	<0.001	<0.001	<0.001	<0.003	803	Hydrocarbon sheen Clear Strong odor
3	23.8	33.8	1.6	6.0	5/14/2013	1,250	3,720	<0.001	<0.001	<0.001	<0.003	885	Hydrocarbon sheen Clear Strong odor
3	24.4	33.8	1.5	6.0	8/14/2013	1,580	4,720	<0.001	0.001	<0.001	<0.003	976	Hydrocarbon sheen Clear Strong odor
3	24.4	33.8	1.5	6.0	10/31/2013	1,080	3,540	<0.001	<0.001	<0.001	<0.003	771	Hydrocarbon sheen Clear Strong odor
3	24.0	33.8	1.6	6.0	2/18/2014	1,040	3,440	<0.001	<0.001	<0.001	<0.003	808	Hydrocarbon sheen Clear Strong odor
3	23.8	33.8	1.6	6.0	4/24/2014	1,020	3,560	<0.001	<0.001	<0.001	<0.003	735	Hydrocarbon sheen Clear Strong odor
3	24.9	33.8	1.4	6.0	7/31/2014	1,080	3,750	<0.001	<0.001	<0.001	<0.003	852	Hydrocarbon sheen Clear Strong odor
3	23.9	33.8	1.6	6.0	11/6/2014	1,780	4,910	<0.001	<0.001	<0.001	<0.003	889	Hydrocarbon sheen Gray to clear Strong odor
3	23.7	33.8	1.6	6.0	2/12/2015	1,520	4,830	<0.001	<0.001	<0.001	<0.003	1,120	Hydrocarbon sheen Clear Strong odor
3	23.4	33.8	1.7	6.0	5/6/2015	1,260	3,900	<0.001	<0.001	<0.001	<0.003	939	Hydrocarbon sheen Clear Strong odor
3	24.2	33.8	1.5	6.0	8/11/2015	1,660	5,050	<0.001	<0.001	<0.001	<0.003	651	Hydrocarbon sheen Clear Strong odor
3	23.9	33.8	1.5	6.0	11/5/2015	1,520	5,110	<0.001	<0.001	<0.001	<0.003	915	Hydrocarbon sheen Clear Strong odor
3	23.6	33.8	1.6	6.0	2/10/2016	1,280	3,980	<0.001	<0.001	<0.001	<0.003	768	Hydrocarbon sheen Clear Strong odor
3	23.2	33.8	1.7	6.0	5/9/2016	1,380	3,910	<0.001	<0.001	<0.001	<0.003	829	Hydrocarbon sheen Clear Strong odor
3	23.7	33.8	1.6	6.0	9/8/2016	1,060	3,680	0.006	<0.001	<0.001	<0.003	829	Hydrocarbon sheen Clear Strong odor
3	23.3	33.8	1.7	6.0	11/8/2016	1,140	3,350	0.026	<0.001	0.005	0.003	808	Hydrocarbon sheen Clear Strong odor
3	23.0	33.8	1.7	6.0	2/16/2017	1,140	3,670	0.001	<0.001	<0.001	<0.003	928	Hydrocarbon sheen Clear Strong odor

3	22.8	33.8	1.8	6.0	4/28/2017	1,108	3,680	0.023	<0.001	0.003	<0.003	999	Hydrocarbon sheen Clear Strong odor
3	23.6	33.8	1.8	6.0	9/5/2017	1,060	3,230	0.041	<0.001	0.006	<0.003	707	Hydrocarbon sheen Clear Strong odor
3	23.5	33.8	1.8	6.0	11/8/2017	1,030	3,770	0.015	<0.001	0.002	<0.003	856	Hydrocarbon sheen Clear Strong odor
3	23.0	33.8	1.7	6.0	2/23/2018	990	3,290	0.018	<0.001	0.002	<0.003	948	Hydrocarbon sheen Clear Strong odor
3	23.1	33.8	1.7	6.0	5/8/2018	1,340	3,580	<0.001	<0.001	0.002	<0.003	999	Hydrocarbon sheen Clear Strong odor
3	24.4	33.8	1.5	6.0	8/30/2018	1,080	3,560	0.034	<0.001	0.006	<0.003	0.04	Hydrocarbon sheen Clear Strong odor
3	23.9	33.8	1.6	6.0	11/8/2018	1,100	3,340	0.035	<0.001	0.002	<0.003	1370	Hydrocarbon sheen Clear Strong odor
3	23.2	33.8	1.7	6.0	2/27/2019	1,200	3,300	0.007	<0.001	<0.001	<0.003	1,080	Hydrocarbon sheen Clear Strong odor
3	23.2	33.8	1.7	6.0	5/22/2019	1,090	3,670	0.006	<0.001	<0.001	<0.003	920	Hydrocarbon sheen Clear Strong odor
3	24.2	33.8	1.5	6.0	8/26/2019	1,040	3,460	0.068	0.002	0.003	<0.003	1,150	Hydrocarbon sheen Clear Strong odor
3	24.0	33.8	1.6	6.0	11/13/2019	1,040	3,540	0.017	<0.001	0.003	<0.003	724	Hydrocarbon sheen Clear Strong odor
3	23.3	33.8	1.7	6	3/2/2020	1,060	3,420	0.002	<0.001	0.003	<0.003	1,580	Hydrocarbon sheen Clear Strong odor
3	24.6	33.8	1.5	6	9/8/2020	980	3,340	0.058	<0.001	0.012	<0.003	582	Hydrocarbon sheen Clear Strong odor



## EME H-20 SWD Groundwater Data

MW	Depth to Water (ft)	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
4	22.9	33.9	1.8	5.0	7/21/2008	1,300	3,860	<0.002	<0.002	<0.002	<0.006	819	Clear Slight odor
4	22.4	33.9	1.8	6.0	10/20/2008	1,120	3,700	<0.001	<0.001	<0.001	<0.003	812	Clear Slight odor
4	22.1	34.3	2.0	6.0	2/5/2009	1,200	3,640	<0.001	<0.001	<0.001	<0.003	746	Clear Slight odor
4	22.0	34.3	2.0	8.0	5/8/2009	1,340	3,720	<0.001	<0.001	<0.001	<0.003	694	Clear Slight odor
4	23.1	34.3	1.8	8.0	8/14/2009	1,240	3,770	<0.001	<0.001	<0.001	<0.003	648	Clear Slight odor
4	23.2	34.3	1.8	8.0	11/4/2009	1,200	3,710	0.001	<0.001	0.004	<0.003	555	Clear Slight odor
4	22.6	34.3	1.9	8.0	2/17/2010	1,380	3,920	<0.001	<0.001	<0.001	<0.003	825	Clear Slight odor
4	22.2	34.3	1.9	8.0	5/19/2010	1,340	3,750	<0.001	<0.001	<0.001	<0.003	760	Clear Slight odor
4	22.0	34.3	2.0	8.0	8/11/2010	1,380	3,870	<0.001	<0.001	<0.001	<0.003	692	Clear Slight odor
4	22.5	34.3	1.9	8.0	11/4/2010	1,280	3,610	0.001	<0.001	<0.001	<0.003	698	Clear Slight odor
4	22.1	34.4	2.0	8.0	2/25/2011	1,440	4,160	<0.001	<0.001	<0.001	<0.003	800	Clear No odor
4	22.4	34.4	1.9	8.0	5/20/2011	1,500	4,000	<0.001	<0.001	<0.001	<0.003	781	Clear Slight odor
4	23.4	34.4	1.8	8.0	8/11/2011	1,400	4,080	0.004	<0.001	<0.001	<0.003	544	Clear Slight odor
4	23.1	34.4	1.8	8.0	11/9/2011	1,480	4,030	0.002	<0.001	<0.001	<0.003	771	Clear Slight odor
4	22.7	34.4	1.9	8.0	2/8/2012	1,500	4,150	0.002	<0.001	<0.001	<0.003	808	Clear Slight odor
4	22.5	34.4	1.9	8.0	5/20/2012	1,360	3,990	<0.001	<0.001	<0.001	<0.003	910	Clear Slight odor
4	23.2	34.4	1.8	8.0	8/7/2012	1,360	3,960	0.001	<0.001	<0.001	<0.003	792	Clear Slight odor
4	23.0	34.4	1.8	8.0	10/31/2012	1,400	4,090	<0.001	<0.001	<0.001	<0.003	773	Clear Slight odor
4	22.7	34.4	1.9	8.0	1/30/2013	1,220	4,000	<0.001	<0.001	<0.001	<0.003	638	Clear Slight odor
4	22.5	34.4	1.9	8.0	5/14/2013	1,340	4,060	<0.001	<0.001	<0.001	<0.003	854	Clear Slight odor
4	23.1	34.4	1.8	8.0	8/14/2013	1,400	4,060	<0.001	<0.001	<0.001	<0.003	878	Clear Slight odor
4	23.1	34.4	1.8	8.0	10/31/2013	1,180	3,730	<0.001	<0.001	<0.001	<0.003	780	Clear Slight odor
4	22.7	34.4	1.9	8.0	2/18/2014	1,200	3,510	<0.001	<0.001	<0.001	<0.003	765	Clear Slight odor
4	22.6	34.4	1.9	8.0	4/24/2014	1,240	3,630	<0.001	<0.001	<0.001	<0.003	593	Clear Slight odor
4	23.7	34.4	1.7	8.0	7/31/2014	1,220	3,740	<0.001	<0.001	<0.001	<0.003	758	Clear Slight odor
4	22.6	34.4	1.9	8.0	11/6/2014	920	3,410	<0.001	<0.001	<0.001	<0.003	501	Clear Slight odor
4	22.4	34.4	1.9	8.0	2/12/2015	1,080	3,520	<0.001	<0.001	<0.001	<0.003	784	Clear Slight Odor
4	22.2	34.4	2.0	8.0	5/6/2015	1,040	3,420	<0.001	<0.001	<0.001	<0.003	719	Clear Slight odor
4	23.0	34.4	1.8	8.0	8/11/2015	1,120	3,930	<0.001	<0.001	<0.001	<0.003	580	Clear Slight odor
4	22.7	34.4	1.8	8.0	11/5/2015	1,140	3,640	<0.001	<0.001	<0.001	<0.003	782	Clear Slight odor
4	22.2	34.4	1.9	8.0	2/10/2016	1,080	3,520	<0.001	<0.001	<0.001	<0.003	703	Clear Slight odor
4	21.9	34.4	2.0	8.0	5/9/2016	1,140	3,460	<0.001	<0.001	<0.001	<0.003	797	Clear Slight odor

4	22.4	34.4	1.9	8.0	9/8/2016	1,260	3,800	<0.001	<0.001	<0.001	<0.003	693	Clear Slight odor
4	22.0	34.4	2.0	8.0	11/8/2016	1,320	3,610	0.001	<0.001	<0.001	<0.003	732	Clear Slight odor
4	21.8	34.4	2.0	8.0	2/16/2017	1,160	3,680	<0.001	<0.001	<0.001	<0.003	960	Clear Slight odor
4	21.6	34.4	2.0	8.0	4/28/2017	1,200	3,780	<0.001	<0.001	<0.001	<0.003	856	Clear Slight odor
4	22.3	34.4	2.0	8.0	9/5/2017	1,340	4,040	<0.001	<0.001	<0.001	<0.003	798	Clear Slight odor
4	22.3	34.4	2.0	8.0	11/8/2017	1,360	3,930	0.003	<0.001	<0.001	<0.003	903	Clear Slight odor
4	21.7	34.4	2.0	8.0	2/23/2018	1,170	3,470	<0.001	<0.001	<0.001	<0.003	863	Clear Slight odor
4	21.8	34.4	2.0	8.0	5/8/2018	1,500	3,730	<0.001	<0.001	<0.001	<0.003	892	Clear Slight odor
4	23.2	34.4	1.8	8.0	8/30/2018	1,460	4,030	<0.001	<0.001	<0.001	<0.003	956	Clear Slight odor
4	22.4	34.4	1.9	8.0	11/8/2018	1,240	2,800	<0.001	<0.001	<0.001	<0.003	968	Clear Slight odor
4	21.9	34.4	2.0	8.0	2/27/2019	1,400	3,790	<0.001	<0.001	<0.001	<0.003	1,080	Clear Slight odor
4	22.0	34.4	2.0	8.0	5/22/2019	1,230	3,650	<0.001	<0.001	<0.001	<0.003	908	Clear Slight odor
4	23.2	34.4	1.8	8.0	8/26/2019	1,240	3,970	<0.001	<0.001	<0.001	<0.003	742	Clear Slight odor
4	22.7	34.4	1.9	8.0	11/13/2019	1,320	3,910	<0.001	<0.001	<0.001	<0.003	756	Clear Slight odor
4	22.0	34.4	2.0	8	3/2/2020	1,220	3,850	<0.001	0.001	<0.001	<0.003	1,940	Clear Slight odor
4	23.9	34.4	1.7	8	9/8/2020	1,220	3,660	0.001	<0.001	<0.001	<0.003	709	Clear Slight odor

## EME H-20 SWD Groundwater Data

MW	Depth to Water (ft)	Total Depth (ft)	Well Volume (gal)	Volume Purged (gal)	Sample Date	Cl (mg/l)	TDS (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl Benzene (mg/l)	Total Xylenes (mg/l)	Sulfate (mg/l)	Comments
5	23.3	37.6	2.3	5.0	7/21/2008	1,400	4,350	<0.002	<0.002	<0.002	<0.006	928	Clear Slight odor
5	23.1	37.6	2.3	8.0	10/20/2008	1,220	4,060	<0.001	<0.001	<0.001	<0.003	894	Clear Slight odor
5	22.7	37.6	2.4	8.0	2/5/2009	1,180	3,940	<0.001	<0.001	<0.001	<0.003	902	Clear Slight odor
5	22.6	37.6	2.4	8.0	5/8/2009	1,320	3,840	<0.001	<0.001	<0.001	<0.003	858	Clear Slight odor
5	23.7	37.6	2.2	8.0	8/14/2009	1,240	3,740	<0.001	<0.001	<0.001	<0.003	730	Clear Slight odor
5	23.8	37.6	2.2	8.0	11/4/2009	1,260	3,640	<0.001	<0.001	<0.001	<0.003	600	Clear Slight odor
5	23.4	37.7	2.3	8.0	2/17/2010	1,260	3,800	<0.001	<0.001	<0.001	<0.003	940	Clear Slight odor
5	22.8	37.7	2.4	8.0	5/19/2010	1,340	3,660	<0.001	<0.001	<0.001	<0.003	783	Clear Slight odor
5	22.6	37.7	2.4	8.0	8/11/2010	1,400	3,690	<0.001	<0.001	<0.001	<0.003	785	Clear Slight odor
5	23.1	37.7	2.3	8.0	11/4/2010	1,560	4,210	0.082	0.002	0.004	<0.006	881	Clear Slight odor
5	22.7	37.7	2.4	8.0	2/25/2011	1,600	4,390	<0.001	<0.001	<0.001	<0.003	829	Clear No odor
5	23.0	37.7	2.3	8.0	5/20/2011	1,680	4,380	<0.001	<0.001	<0.001	<0.003	877	Clear Slight odor
5	23.9	37.7	2.2	8.0	8/11/2011	1,600	4,420	<0.001	<0.001	<0.001	<0.003	799	Clear Slight odor
5	23.9	37.7	2.2	8.0	11/9/2011	1,600	4,460	<0.001	<0.001	<0.001	<0.003	974	Clear Slight odor
5	23.3	37.7	2.3	8.0	2/8/2012	1,560	4,430	<0.001	<0.001	<0.001	<0.003	973	Clear Slight odor
5	23.1	37.7	2.3	8.0	5/20/2012	1,480	4,190	<0.001	<0.001	<0.001	<0.003	1,030	Clear Slight odor
5	23.9	37.7	2.2	8.0	8/7/2012	1,320	3,840	<0.001	<0.001	0.001	<0.003	935	Clear Slight odor
5	23.7	37.7	2.2	8.0	10/31/2012	1,240	3,820	<0.001	<0.001	<0.001	<0.003	750	Clear Slight odor
5	23.3	37.7	2.3	8.0	1/30/2013	1,140	3,730	<0.001	<0.001	<0.001	<0.003	686	Clear Slight odor
5	23.1	37.7	2.3	8.0	5/14/2013	1,200	3,850	<0.001	<0.001	<0.001	<0.003	961	Clear Slight odor
5	23.7	37.7	2.2	8.0	8/14/2013	1,070	3,600	<0.001	<0.001	<0.001	<0.003	802	Clear Slight odor
5	23.8	37.7	2.2	8.0	10/31/2013	1,000	3,460	<0.001	<0.001	<0.001	<0.003	750	Clear Slight odor
5	23.4	37.7	2.3	8.0	2/18/2014	1,000	3,540	<0.001	<0.001	<0.001	<0.003	850	Clear Slight odor
5	23.2	37.7	2.3	8.0	4/24/2014	1,060	3,690	<0.001	<0.001	<0.001	<0.003	860	Clear Slight odor
5	24.3	37.7	2.1	8.0	7/31/2014	1,040	3,520	<0.001	<0.001	<0.001	<0.003	955	Clear Slight odor
5	23.3	37.7	2.3	8.0	11/6/2014	1,100	3,500	<0.001	<0.001	<0.001	<0.003	549	Clear Slight odor
5	23.0	37.7	2.3	8.0	2/12/2015	1,040	3,760	<0.001	<0.001	<0.001	<0.003	869	Clear Slight odor
5	22.7	37.7	2.4	8.0	5/6/2015	1,200	4,090	<0.001	<0.001	<0.001	<0.003	977	Clear Slight odor
5	23.5	37.7	2.3	8.0	8/11/2015	1,220	4,350	<0.001	<0.001	<0.001	<0.003	1,270	Clear Slight odor
5	23.2	37.7	2.3	8.0	11/5/2015	1,360	4,060	<0.001	<0.001	<0.001	<0.003	353	Clear Slight odor
5	22.7	37.7	2.3	8.0	2/10/2016	1,240	4,160	<0.001	<0.001	<0.001	<0.003	1,060	Clear Slight odor
5	22.5	37.7	2.4	8.0	5/9/2016	1,080	3,860	<0.001	<0.001	<0.001	<0.003	979	Clear Slight odor



5	23.1	37.7	2.3	8.0	9/8/2016	1,120	3,790	<0.001	<0.001	<0.001	<0.003	905	Clear Slight odor
5	22.6	37.7	2.4	8.0	11/8/2016	1,300	4,010	<0.001	<0.001	<0.001	<0.003	1,020	Clear Slight odor
5	22.4	37.7	2.4	8.0	2/16/2017	1,180	3,710	<0.001	<0.001	<0.001	<0.003	975	Clear Slight odor
5	22.2	37.7	2.5	8.0	4/28/2017	1,180	3,760	<0.001	<0.001	<0.001	<0.003	1050	Clear Slight odor
5	22.9	37.7	2.5	8.0	9/5/2017	1,160	3,940	<0.001	<0.001	<0.001	<0.003	941	Clear Slight odor
5	22.8	37.7	2.5	8.0	11/8/2017	1,060	3,570	<0.001	<0.001	<0.001	<0.003	926	Clear Slight odor
5	22.3	37.7	2.5	8.0	2/23/2018	1,060	3,690	<0.001	<0.001	<0.001	<0.003	974	Clear Slight odor
5	22.4	37.7	2.4	8.0	5/8/2018	1,230	3,890	<0.001	<0.001	<0.001	<0.003	1120	Clear Slight odor
5	23.7	37.7	2.2	8.0	8/30/2018	1,140	3,500	<0.001	<0.001	<0.001	<0.003	958	Clear Slight odor
5	23.0	37.7	2.3	8.0	11/8/2018	1,140	3,290	<0.001	<0.001	<0.001	<0.003	992	Clear Slight odor
5	22.5	34.7	2.4	8.0	2/27/2019	1,280	3,450	<0.001	<0.001	<0.001	<0.003	1,230	Clear Slight odor
5	22.6	34.7	2.4	8.0	5/22/2019	1,280	4,110	<0.001	<0.001	<0.001	<0.003	1,060	Clear Slight odor
5	23.7	34.7	2.2	8.0	8/26/2019	1,100	3,610	<0.001	<0.001	<0.001	<0.003	806	Clear Slight odor
5	23.3	34.7	2.3	8.0	11/13/2019	1,040	3,420	<0.001	<0.001	<0.001	<0.003	792	Clear Slight odor
5	22.7	37.7	2.4	8	3/2/2020	1,090	3,530	<0.001	0.002	<0.001	<0.003	1,800	Clear Slight odor
5	23.4	37.7	2.3	8	9/8/2020	980	3,350	<0.001	<0.001	<0.001	<0.003	629	Clear Slight odor



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March 10, 2020

KATIE JONES

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 03/05/20 14:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-19-12. 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).

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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 "Celey D. Keene". The signature is written in a cursive style with a large, stylized 'C' and 'K'.

Celey D. Keene

Lab Director/Quality Manager



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**Analytical Results For:**

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

Received:	03/05/2020	Sampling Date:	03/02/2020
Reported:	03/10/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #1 (H000724-01)**

BTEX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Benzene*</b>	<b>0.001</b>	0.001	03/06/2020	ND	0.020	102	0.0200	0.425	
Toluene*	<0.001	0.001	03/06/2020	ND	0.020	99.8	0.0200	0.240	
Ethylbenzene*	<0.001	0.001	03/06/2020	ND	0.020	101	0.0200	0.0198	
Total Xylenes*	<0.003	0.003	03/06/2020	ND	0.060	99.6	0.0600	0.0921	
Total BTEX	<0.006	0.006	03/06/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.8 % 58.2-133

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride*</b>	<b>1000</b>	4.00	03/06/2020	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Sulfate*</b>	<b>1550</b>	250	03/05/2020	ND	22.5	113	20.0	2.28	

TDS 160.1		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>TDS*</b>	<b>3420</b>	5.00	03/10/2020	ND	526	105	500	2.86	

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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**Analytical Results For:**

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

Received:	03/05/2020	Sampling Date:	03/02/2020
Reported:	03/10/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #2 (H000724-02)**

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	03/06/2020	ND	0.020	102	0.0200	0.425		
Toluene*	<0.001	0.001	03/06/2020	ND	0.020	99.8	0.0200	0.240		
Ethylbenzene*	<0.001	0.001	03/06/2020	ND	0.020	101	0.0200	0.0198		
Total Xylenes*	<0.003	0.003	03/06/2020	ND	0.060	99.6	0.0600	0.0921		
Total BTEX	<0.006	0.006	03/06/2020	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.0 % 58.2-133

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	800	4.00	03/06/2020	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	885	250	03/05/2020	ND	22.5	113	20.0	2.28	

TDS 160.1		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	2840	5.00	03/10/2020	ND	526	105	500	2.86	

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager





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

**Analytical Results For:**

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

Received:	03/05/2020	Sampling Date:	03/02/2020
Reported:	03/10/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #3 (H000724-03)**

BTEX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.002	0.001	03/06/2020	ND	0.020	102	0.0200	0.425	
Toluene*	<0.001	0.001	03/06/2020	ND	0.020	99.8	0.0200	0.240	
Ethylbenzene*	<0.001	0.001	03/06/2020	ND	0.020	101	0.0200	0.0198	
Total Xylenes*	<0.003	0.003	03/06/2020	ND	0.060	99.6	0.0600	0.0921	
Total BTEX	<0.006	0.006	03/06/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.9 % 58.2-133

Chloride, SM4500CI-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	1060	4.00	03/06/2020	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	1580	250	03/05/2020	ND	22.5	113	20.0	2.28		

TDS 160.1		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3420	5.00	03/10/2020	ND	526	105	500	2.86	

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Celey D. Keene, Lab Director/Quality Manager



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**Analytical Results For:**

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

Received:	03/05/2020	Sampling Date:	03/02/2020
Reported:	03/10/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #4 (H000724-04)**

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	03/06/2020	ND	0.020	102	0.0200	0.425	
<b>Toluene*</b>	<b>0.001</b>	0.001	03/06/2020	ND	0.020	99.8	0.0200	0.240	
Ethylbenzene*	<0.001	0.001	03/06/2020	ND	0.020	101	0.0200	0.0198	
Total Xylenes*	<0.003	0.003	03/06/2020	ND	0.060	99.6	0.0600	0.0921	
Total BTEX	<0.006	0.006	03/06/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 100 % 58.2-133

Chloride, SM4500CI-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	1220	4.00	03/06/2020	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	1940	250	03/05/2020	ND	22.5	113	20.0	2.28		

TDS 160.1		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3850	5.00	03/10/2020	ND	526	105	500	2.86	

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Celey D. Keene, Lab Director/Quality Manager



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**Analytical Results For:**

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

Received: 03/05/2020  
 Reported: 03/10/2020  
 Project Name: EME JUNCTION H - 20  
 Project Number: NONE GIVEN  
 Project Location: T20S-R37E-SEC20 H-LEA CO NM

Sampling Date: 03/02/2020  
 Sampling Type: Water  
 Sampling Condition: Cool & Intact  
 Sample Received By: Tamara Oldaker

**Sample ID: MONITOR WELL #5 (H000724-05)**

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	03/06/2020	ND	0.020	102	0.0200	0.425	
<b>Toluene*</b>	<b>0.002</b>	0.001	03/06/2020	ND	0.020	99.8	0.0200	0.240	
Ethylbenzene*	<0.001	0.001	03/06/2020	ND	0.020	101	0.0200	0.0198	
Total Xylenes*	<0.003	0.003	03/06/2020	ND	0.060	99.6	0.0600	0.0921	
Total BTEX	<0.006	0.006	03/06/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.5 % 58.2-133

Chloride, SM4500CI-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	1090	4.00	03/06/2020	ND	104	104	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	1800	250	03/05/2020	ND	22.5	113	20.0	2.28		

TDS 160.1		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3530	5.00	03/10/2020	ND	526	105	500	2.86	

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Celey D. Keene, Lab Director/Quality Manager

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---

### Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
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 "Celey D. Keene".

---

Celey D. Keene, Lab Director/Quality Manager

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

# Cardinal Laboratories, Inc.

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID #

Company Name:  
RICE Operating Company

BILL TO	Company:	PO#
---------	----------	-----

Project Manager:

Address: (Street, City, Zip)

Katie Jones

122 W Taylor Street ~ Hobbs, New Mexico 88240

Address: (Street, City, Zip)

Phone#: Fax#:

122 W Taylor Street ~ Hobbs, New Mexico 88240

(575) 393-9174

Fax#:  
(575)397-1471

Phone #:  
(575) 393-9174

Fax #:  
(575) 397-1471

Project #:	Project Name:
	EME Junction H-20

Project Location:  
T20S-R37E-Sec20 H ~ Lea County - New Mexico

Sampler Signature: Rozanne Johnson (575)631-9310

[illegible]

Relinquished by: Rozanne Johnson Date: 3/5/2020 Time: 14:14

Received by: Tawana R. [Signature] Date: 3-5-20 Time:

Phone Results	Yes	No
Fax Results	Yes	No      Additional Fax Number:

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

Received By: (Laboratory Staff)      Date:      Time:

REMARKS:

Delivered By: (Circle One)

Sample Condition

CHECKED BY:

	Cool	Intact
Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>

(Initials)

Sampler - UPS - Bus - Other:

Email Results: [kjones@riceswd.com](mailto:kjones@riceswd.com)  
[rozanne11@windstream.net](mailto:rozanne11@windstream.net)





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---

September 17, 2020

KATIE JONES

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 09/11/20 13:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-20-13. 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,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	09/11/2020	Sampling Date:	09/08/2020
Reported:	09/17/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #1 (H002418-01)**

BTEX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Benzene*</b>	<b>0.030</b>	0.001	09/11/2020	ND	0.021	103	0.0200	1.25	QM-07, QR-03
Toluene*	<0.001	0.001	09/11/2020	ND	0.020	101	0.0200	1.07	
<b>Ethylbenzene*</b>	<b>0.005</b>	0.001	09/11/2020	ND	0.020	100	0.0200	1.26	
Total Xylenes*	<0.003	0.003	09/11/2020	ND	0.059	99.1	0.0600	1.05	
<b>Total BTEX</b>	<b>0.035</b>	0.006	09/11/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.9 % 58.2-133

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride*</b>	<b>960</b>	4.00	09/14/2020	ND	100	100	100	3.92	
Sulfate 375.4		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Sulfate*</b>	<b>489</b>	83.3	09/14/2020	ND	18.6	92.8	20.0	2.12	
TDS 160.1		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>TDS*</b>	<b>3330</b>	5.00	09/15/2020	ND	832	83.2	1000	0.464	

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Celey D. Keene, Lab Director/Quality Manager



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**Analytical Results For:**

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

Received:	09/11/2020	Sampling Date:	09/08/2020
Reported:	09/17/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #2 (H002418-02)**

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	09/11/2020	ND	0.021	103	0.0200	1.25		
Toluene*	<0.001	0.001	09/11/2020	ND	0.020	101	0.0200	1.07		
Ethylbenzene*	<0.001	0.001	09/11/2020	ND	0.020	100	0.0200	1.26		
Total Xylenes*	<0.003	0.003	09/11/2020	ND	0.059	99.1	0.0600	1.05		
Total BTEX	<0.006	0.006	09/11/2020	ND						

Surrogate: 4-Bromofluorobenzene (PID) 96.8 % 58.2-133

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	800	4.00	09/14/2020	ND	100	100	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	545	83.3	09/14/2020	ND	18.6	92.8	20.0	2.12	

TDS 160.1		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	2830	5.00	09/15/2020	5.00	830	83.0	1000	1.14	

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**Analytical Results For:**

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

Received:	09/11/2020	Sampling Date:	09/08/2020
Reported:	09/17/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #3 (H002418-03)**

BTX 8021B		mg/L		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.058	0.001	09/11/2020	ND	0.021	103	0.0200	1.25	
Toluene*	<0.001	0.001	09/11/2020	ND	0.020	101	0.0200	1.07	
Ethylbenzene*	0.012	0.001	09/11/2020	ND	0.020	100	0.0200	1.26	
Total Xylenes*	<0.003	0.003	09/11/2020	ND	0.059	99.1	0.0600	1.05	
Total BTX	0.070	0.006	09/11/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 93.8 % 58.2-133

Chloride, SM4500CI-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	980	4.00	09/14/2020	ND	100	100	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	582	83.3	09/14/2020	ND	18.6	92.8	20.0	2.12		

TDS 160.1		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	3340	5.00	09/16/2020	5.00	830	83.0	1000	1.14	

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**Analytical Results For:**

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

Received:	09/11/2020	Sampling Date:	09/08/2020
Reported:	09/17/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #4 (H002418-04)**

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	09/11/2020	ND	0.021	103	0.0200	1.25	
Toluene*	<0.001	0.001	09/11/2020	ND	0.020	101	0.0200	1.07	
Ethylbenzene*	<0.001	0.001	09/11/2020	ND	0.020	100	0.0200	1.26	
Total Xylenes*	<0.003	0.003	09/11/2020	ND	0.059	99.1	0.0600	1.05	
Total BTEX	<0.006	0.006	09/11/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.0 % 58.2-133

Chloride, SM4500Cl-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	1220	4.00	09/14/2020	ND	100	100	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	709	125	09/14/2020	ND	18.6	92.8	20.0	2.12		

TDS 160.1		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	3660	5.00	09/15/2020	5.00	830	83.0	1000	1.14		

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager





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

**Analytical Results For:**

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

Received:	09/11/2020	Sampling Date:	09/08/2020
Reported:	09/17/2020	Sampling Type:	Water
Project Name:	EME JUNCTION H - 20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	T20S-R37E-SEC20 H-LEA CO NM		

**Sample ID: MONITOR WELL #5 (H002418-05)**

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	09/11/2020	ND	0.021	103	0.0200	1.25	
Toluene*	<0.001	0.001	09/11/2020	ND	0.020	101	0.0200	1.07	
Ethylbenzene*	<0.001	0.001	09/11/2020	ND	0.020	100	0.0200	1.26	
Total Xylenes*	<0.003	0.003	09/11/2020	ND	0.059	99.1	0.0600	1.05	
Total BTEX	<0.006	0.006	09/11/2020	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.1 % 58.2-133

Chloride, SM4500CI-B		mg/L		Analyzed By: GM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	980	4.00	09/14/2020	ND	100	100	100	3.92	

Sulfate 375.4		mg/L		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate*	629	83.3	09/14/2020	ND	18.6	92.8	20.0	2.12		

TDS 160.1		mg/L		Analyzed By: GM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS*	3350	5.00	09/15/2020	5.00	830	83.0	1000	1.14		

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Celey D. Keene, Lab Director/Quality Manager

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### Notes and Definitions

QR-03	The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
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 "Celey D. Keene".

---

Celey D. Keene, Lab Director/Quality Manager

# Cardinal Laboratories, Inc.

Company Name: <b>RICE Operating Company</b>		BILL TO Company: <b>RICE Operating Company</b>		PO#
Project Manager: <b>Katie Jones</b>		Address: (Street, City, Zip) <b>122 W Taylor Street ~ Hobbs, New Mexico 88240</b>		
Address: (Street, City, Zip) <b>122 W Taylor Street ~ Hobbs, New Mexico 88240</b>		Phone#: <b>(575) 393-9174</b>		Fax#: <b>(575)397-1471</b>
Phone #: <b>(575) 393-9174</b>		Fax #: <b>(575) 397-1471</b>		
Project #:		Project Name: <b>EME Junction H-20</b>		
Project Location: <b>T20S-R37E-Sec20 H ~ Lea County - New Mexico</b>		Sampler Signature: <b>Rozanne Johnson (575)631-9310</b>		

[illegible]

Relinquished by: <i>Rozanne Johnson</i> Date: <i>9/11/2020</i> Time: <i>13:25</i>	Received by: <i>Rozanne Johnson</i> Date: <i>9-11-20</i> Time: <i>1330</i>											
Relinquished by: _____ Date: _____ Time: _____	Received by: (Laboratory Staff) _____ Date: _____ Time: _____											
Delivered By: (Circle One)  <i>Sampler</i> - UPS - Bus - Other:	<table border="1"> <tr> <td colspan="2">Sample Condition</td> <td rowspan="2">CHECKED BY:  (Initials) <i>TE</i></td> </tr> <tr> <td>Yes</td> <td>Intact</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>No</td> <td>No</td> <td></td> </tr> </table>	Sample Condition		CHECKED BY:  (Initials) <i>TE</i>	Yes	Intact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		No	No	
Sample Condition		CHECKED BY:  (Initials) <i>TE</i>										
Yes	Intact											
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>											
No	No											

### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

## ANALYSIS REQUEST

(Circle or Specify Method No.)

[illegible]

Phone Results	Yes	No
Fax Results	Yes	No      Additional Fax Number:

REMARKS:

Email Results: [kjones@riceswd.com](mailto:kjones@riceswd.com)  
[rozanne@sdacres.com](mailto:rozanne@sdacres.com)

**District I**  
1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720  
**District II**  
811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720  
**District III**  
1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170  
**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS  
  
Action 24179

CONDITIONS

Operator: RICE OPERATING COMPANY 122 W Taylor Hobbs, NM 88240	OGRID:
	19174
	Action Number: 24179
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See App ID 90572 for most updated status.	10/5/2022