FOURTH ANNUAL GROUNDWATER MONITORING REPORT
CHESAPEAKE ENERGY CORPORATION
STATE M LEASE (AP-72)
LEA COUNTY, NEW MEXICO

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1.0 INTRODUCTION

Chesapeake Energy Corporation (Chesapeake) retained Enviro Clean Cardinal, LLC (ECC), to perform impacted groundwater monitoring and light non-aqueous phase liquid (LNAPL) hydrocarbon remediation at Chesapeake's former State M Lease site (Site) located in Lea County, New Mexico. The Site is located approximately 8 miles south-southwest of Lovington, New Mexico in the SE-SW-SE of Section 18, Township 17 South, Range 36 East, Lea County, New Mexico (coordinates 32.828061º latitude, -103.391012º longitude). The Site location and topographic features are shown on **Figure 1**. An oil and gas production tank battery was formerly located at the Site. Chesapeake purchased the Site in 2004, but never operated the tank battery. Chesapeake began abandonment and environmental investigation activities at the Site in 2007.

Initial Site investigation activities were conducted in May 2007. These investigation activities consisted of conducting EM-31 and EM-34 ground conductivity surveys, the collection of soil samples from nine boreholes, and the installation and sampling of seven groundwater monitoring wells. Following the investigation in August 2007, Chesapeake submitted to the New Mexico Oil Conservation Division (NMOCD) a Stage 1 Abatement Plan for the Site. In May 2010, the NMOCD responded to Chesapeake that the agency was not adequately staffed to review the abatement plan in a timely manner and advised Chesapeake that they could proceed with abatement operations at risk. In July 2010, Chesapeake notified the NMOCD of their intent to proceed with the Stage 1 Abatement activities. On March 20, 2012, following implementation of these activities, Chesapeake submitted the Stage 1 Abatement Report for the Site.

On March 27, 2012, Chesapeake submitted to the NMOCD the ***Stage 2 Abatement Plan*** (Plan) for the Site. A copy of the Plan is provided in **Appendix A**. In this Plan, Chesapeake proposed the following abatement activities at the Site:

- Excavate and remove the near-surface soils at the Site containing concentrations of chloride exceeding 1,000 milligrams per kilogram (mg/kg),

- Excavate and remove the near-surface soils at the Site containing concentrations of TPH exceeding 1,000 mg/kg,
- Install clay liners in areas where chloride and/or TPH concentrations exceed 1,000 mg/kg at depths greater than five feet below ground level (bgl),
- Install one additional groundwater monitoring well downgradient of the Site,
- Monitor the groundwater at the Site until the concentrations of chloride and benzene are below the New Mexico Water Quality Control Commission standards.

On March 7, 2013, NMOCD notified Chesapeake that the Plan was administratively complete and that Chesapeake should proceed with public notice of the Plan. On March 30, 2013, Chesapeake published a notice of the proposed activities in the Albuquerque Journal, the Hobbs-Daily News Sun and the Lovington Leader. In addition, written notification of the Plan submittal was sent to all surface owners of record within a 1-mile radius of the Site. On June 27, 2013 upon completion of the notification activities, the NMOCD approved the Plan for the Site. A copy of the NMOCD correspondence approving the Plan is included in **Appendix B**.

The soil remediation activities outlined in the Plan were conducted at the Site during the period January 15, 2014 through March 27, 2014. The soil remediation activities were summarized in the document titled ***Soil Remediation Summary Report***, submitted to the NMOCD on August 6, 2014.

This ***Fourth Annual Groundwater Monitoring Report*** (Report) summarizes the groundwater monitoring activities conducted at the Site during the following quarterly sampling events:

- Thirteenth Event - June 6 - 7, 2017,
- Fourteenth Event - September 8, 2017,
- Fifteenth Event - December 4 - 6, 2017, and
- Sixteenth Event - March 5 - 7, 2018.

2.0 REMEDIATION

2.1 SVE SYSTEM

As documented in the ***First Annual Groundwater Monitoring Report***, dated May 19, 2015, during the period May 12-14, 2014, ECC installed and made operational a soil vapor extraction (SVE) remediation system (System) at the Site. The System is comprised of 8 SVE wells connected through a manifold system constructed of two and three inch Schedule 80 PVC piping and plumbed to a 10-horsepower 3-phase SVE Regenerative Blower housed within the System Building. The location of the System Building is shown on attached **Figure 2**. Within the System, soil vapor from the SVE wells is drawn through a moisture knock out/separator and a particulate filter prior to reaching the blower. An air-flow meter is installed downstream of the blower in the air-exhaust line and an air sample port is located on the air-exhaust line at a location upstream of its exit from the System Building.

System start-up was conducted on June 6, 2014. Routine checks of the System are conducted to record the blower run times, discharge rate/ACFM and VOC concentration of the discharge-air stream. These field readings are used to calculate the approximate weight of VOCs extracted from the subsurface and discharged from the System. The field PID data are entered into to a spreadsheet to calculate the VOC discharge rate and approximate total pounds removed by the System. The approximate total VOC discharges for each quarter are then summed to provide a cumulative VOC discharge total. These data are summarized in **Table 1**. Through March 16, 2018, the field PID data suggest that approximately 5,968 pounds of VOCs have been removed from the subsurface and discharged from the System.

During the reporting period, discharge-air samples were collected quarterly in laboratory-provided Suma canisters, shipped under chain-of-custody control to TestAmerica Laboratories, Inc. (West Sacramento, California) and analyzed for VOC compounds and total VOCs as hexane by Method TO-15. During the thirteenth quarter, discharge-air sample 20170607MSVE was collected on June 7, 2017. On this date, the System had been running for a total of 23,384 hours, was operating at 221 ACFM and had a field reading of 54 PPM from the discharge air stream. Laboratory analytical results for this discharge-air sample indicated a total VOC as Hexane concentration of 54,500 PPB volume/volume (54.5 PPM V/V). During the fourteenth quarter, discharge-air sample 20170907 M SVE was collected on September 7, 2017. On this date, the System had been running for a total of 29,699 hours, was operating at 200 ACFM and had a field reading of 62 PPM from the discharge air stream. Laboratory analytical results for

this discharge-air sample indicated a total VOC as Hexane concentration of 40,900 PPB V/V (40.9 PPM V/V). During the fifteenth quarter period, discharge-air sample 20171206-M-SVE was collected on December 6, 2017. On this date, the System had been running for a total of 31,860 hours, was operating at 270 ACFM and had a field reading of 6 PPM from the discharge air stream. Laboratory analytical results for this discharge-air sample indicated a total VOC as Hexane concentration of 4,630 PPB V/V (4.63 PPM V/V). During the sixteenth quarter, discharge-air sample 20180307-M-SVE was collected on March 7, 2018. On this date, the System had been running for a total of 34,040 hours, was operating at 227 ACFM and had a field reading of 52 PPM from the discharge air stream. Laboratory analytical results for this discharge-air sample indicated a total VOC as Hexane concentration of 9,930 PPB V/V (9.93 PPM V/V). A summary of the laboratory analytical results for the discharge-air samples is presented in **Table 2**, and complete copies of the laboratory analytical reports and chain-of-custody documentation are provided in **Appendix C**. The discharge-air analytical data are used to compute a correlation factor for the field PID readings to more accurately calculate the total VOC discharged.

Field PID instrument readings are typically lower than laboratory analysis for total VOCs. To compensate for the low field PID readings, a correlation factor is calculated based upon the ratio of the laboratory analytical value versus the field PID value. The correlation factor is then used to multiply the field PID readings and calculate the total VOC discharge. To accurately reflect the total VOC discharge from the System during a given period, **Table 1** includes the calculated unique correlation factor for each quarterly air-discharge sampling event. This unique correlation factor is then utilized to calculate the total VOC discharge from the System for the period in which that particular air-discharge sample was collected. Utilizing the noted correlation factors, approximately 11,569 pounds of VOCs have been removed from the subsurface at the Site.

Figure 3 presents a graph of the VOC concentrations observed in the discharge air stream versus time. As can be seen on this figure, the levels of VOC observed in the air discharge stream have decreased dramatically since startup. These data indicate that the System is effective at removing the hydrocarbon vapors from the subsurface. Removal of hydrocarbon vapors coupled with the influx of oxygen drawn into the impacted area by the System enhances biodegradation of the hydrocarbon impacts observed in this area.

2.2 MW-1R LNAPL RECOVERY

As documented in the ***First Annual Groundwater Monitoring Report***, dated May 19, 2015, to enhance LNAPL recovery in the MW-1R area, 2-inch diameter monitoring well MW-1 was plugged and replaced with 4-inch diameter monitoring well MW-1R. On June 5, 2014, a QED Environmental Genie LNAPL recovery pump was placed and made operational in monitoring well MW-1R. The Genie LNAPL recovery pump is an air-actuated bladder pump with a floating intake (skimmer), set at a depth that produces the maximum amount of LNAPL recovery per cycle. Air is provided to the Genie LNAPL recovery pump from a compressor located within the System Building.

During the reporting period, approximately 3 drums (120 gallons) of LNAPL were recovered from monitoring well MW-1R. Since start-up of the Genie LNAPL recovery pump, a total of approximately 14 drums (725 gallons) of LNAPL have been recovered from the Site. During each quarterly monitoring event, the recovery pump and controller is inspected, cleaned and adjusted to maximize LNAPL recovery.

3.0 QUARTERLY GROUNDWATER MONITORING

This Report describes the findings from four quarterly groundwater sampling events conducted at the Site from June 6, 2017 through March 7, 2018.

3.1 GROUNDWATER MONITORING METHODOLOGY

Prior to collecting groundwater samples during each quarterly event, ECC gauged all 8 monitoring wells (MW-1R through MW-8) at the Site using an electronic interface probe to determine the depth-to-water (DTW) and LNAPL thickness within each well. The locations of these monitoring wells are shown on **Figure 2**. DTWs were measured from the surveyed top-of-casing (TOC) of each well and converted to elevations relative to mean sea level. These data are presented in **Table 3**. Potentiometric surface maps were constructed utilizing these data to illustrate the groundwater flow direction within the shallow groundwater system beneath the Site. These potentiometric surface maps are presented on **Figures 4** through **7**. As can be seen on the figures, groundwater flow at the Site is, in general, from the northwest to the southeast.

Upon completion of DTW measurement activities, ECC field personnel collected groundwater samples from monitoring wells MW-1R through MW-8. Due to the LNAPL present in monitoring well MW-1R, a disposable polyethylene bailer was used to evacuate the LNAPL from the well casing and a new bailer was then used to collect the groundwater sample. Groundwater samples were collected from monitoring wells MW-2 through MW-8 utilizing EPA approved low-flow purging/sampling methodologies. Field parameters consisting of pH, specific conductivity, temperature, and dissolved oxygen (DO) were measured during field activities utilizing a multi-parameter meter and air-tight flow-through cell. Upon stabilization of the field parameters, groundwater samples were collected into laboratory prepared containers, labeled as to source and contents, placed on ice for preservation, placed under chain-of-custody control and shipped via overnight courier to the analytical laboratory (TestAmerica Inc., Nashville, Tennessee). As per the Plan, groundwater samples collected from monitoring wells MW-1R through MW-8 during each sampling event were analyzed for chloride (EPA Method 300.0). A summary of the laboratory analytical results for chloride analyses is presented in **Table 4**, and complete copies of the laboratory analytical reports and chain-of-custody documentation is proved in **Appendix C**. The laboratory analytical results from these groundwater sampling events have been screened against the New Mexico Administrative Code 20.6.2, Standards for Groundwater of 10,000 mg/L TDS Concentration or Less (Limit) for chloride of 250 mg/L.

As specified in the Plan, chloride is the primary constituent of concern (COC) at the Site until the LNAPL has been adequately eliminated from monitoring well MW-1R. When the LNAPL has been adequately eliminated from monitoring well MW-1R, the groundwater within this well will be monitored for benzene, toluene, ethylbenzene and total xylenes (BTEX) until the levels of BTEX fall below the Limits of 0.01 mg/L, 0.75 mg/L, 0.75 mg/L and 0.62 mg/L, respectively.

3.2 THIRTEENTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The thirteenth groundwater sampling event was conducted at the Site during the period June 6-7, 2017. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (493 mg/L) and MW-8 (531 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L.

During the thirteenth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 3.04 feet. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

3.3 FOURTEENTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The fourteenth quarterly groundwater sampling event was conducted at the Site on September 8, 2017. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (465 mg/L) and MW-8 (573 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L.

During the fourteenth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 0.33 feet. The measurement from this event indicates a decrease of 2.71 feet in the observed LNAPL thickness from the previous event. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

3.4 FIFTEENTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The fifteenth quarterly groundwater sampling event was conducted at the Site during the period December 4-6, 2017. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (492 mg/L) and MW-8 (570 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L.

During the fifteenth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 0.41 feet. The measurement from this event indicates a slight

increase of 0.08 feet in the observed LNAPL thickness from the previous event. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

3.5 SIXTEENTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The sixteenth quarterly groundwater sampling event was conducted at the Site during the period March 5-7, 2018. As can be seen in **Table 4**, the groundwater samples collected from monitoring wells MW-4 (484 mg/L) and MW-8 (587 mg/L) during this sampling event exhibited concentrations of chloride that exceed the Limit of 250 mg/L. **Figure 8** presents an isopleth of the chloride concentrations observed in the groundwater samples collected during this sampling event. As can be seen on this figure, the highest levels of chloride observed in Site groundwater are observed in monitoring wells MW-4 and MW-8, in the southeast portion of the Site.

Figure 9 presents chloride concentration trend graphs for each of the monitoring wells sampled at the Site. A review of this figure indicates that the trends of chloride concentrations observed in the groundwater samples are increasing in monitoring well MW-8, decreasing in monitoring well MW-6, and stable in monitoring wells MW-1R, MW-2, MW-3, MW-4, MW-5, and MW-7. The soil remediation activities conducted in the first quarter of 2014 have removed the continuing source of chloride impacts to the groundwater at the Site. Source removal has facilitated the physical natural attenuation mechanisms of dispersion and dilution on remnant chloride concentrations present in Site groundwater. The increasing chloride concentration trend observed in monitoring well MW-8 is likely caused by the dispersion of remnant chloride impacts from the source area to this downgradient well.

During the sixteenth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 0.34 feet. The measurement from this event indicates a slight decrease of 0.07 feet in the observed LNAPL thickness from the previous event. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

4.0 CONCLUSIONS

Based upon the data presented herein, the following conclusions are presented:

- Groundwater beneath the Site is encountered at depths ranging from approximately 45 to 48 feet BGL.
- The direction of groundwater flow at the Site is, in general, from the northwest to the southeast.
- During the reporting period, concentrations of chloride greater than the Limit of 250 mg/L were observed in the groundwater samples collected from monitoring wells MW-4 (ranging from 465 mg/L to 493 mg/L) and MW-8 (ranging from 531 mg/L to 587 mg/L).
- The SVE System is operating as designed and has removed approximately 11,569 pounds of VOCs since start-up on June 6, 2014.
- During the reporting period, approximately 3 drums (120 gallons) of LNAPL were recovered from monitoring well MW-1R.

5.0 RECOMMENDATIONS

Based upon a review of the data presented within this report, the following recommendations have been developed:

- Operation of the SVE System at the Site should continue until the LNAPL observed on the groundwater in the monitoring well MW-1R area has been adequately eliminated.

- As specified in the Plan, LNAPL recovery within monitoring well MW-1R should be continued until the LNAPL observed within this well has been adequately eliminated. Efforts to optimize LNAPL recovery while minimizing pump down-time should be implemented.

- As specified in the Plan, when the LNAPL has been adequately eliminated from monitoring well MW-1R, the groundwater within this well should be monitored for BTEX until the levels of these constituents fall below the Limits of 0.01 mg/L, 0.75 mg/L, 0.75 mg/L and 0.62 mg/L, respectively, for eight quarters.

- The groundwater analytical data indicates that concentrations of chloride have never been detected above the Limit of 250 mg/L in monitoring wells MW-1R, MW-2, MW-3, MW-5 and MW-7. In addition, the concentrations of chloride observed in monitoring well MW-6 have been below the Limit for the last ten quarterly monitoring events. These data suggest that the chloride plume is localized around monitoring wells MW-4 and MW-8. As per the approved Plan, monitoring wells MW-1R, MW-2, MW-3, MW-5, MW-6, and MW-7 have all surpassed eight consecutive quarters of chloride concentrations below the Limit, therefore groundwater monitoring for chloride will be discontinued in those wells, respectively. The groundwater within monitoring wells MW-4 and MW-8 should be monitored on a quarterly basis for chloride until the eight quarters of sample results indicate the chloride levels observed in this well are below the New Mexico Water Quality Control Commission standards. The next groundwater monitoring event at the Site is scheduled to be conducted in June 2018.

TABLES

Table 1 : Summary of SVE System Field Readings
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Date	Time	Run Time Reading	Operating Hours		Discharge Readings		VOC Discharge				Calculated Correlation Factor
			since last reading	Total	PPM	CFM	lbs/Hr	lbs since last Reading	Total lbs	Total Tons	
06/07/14	8:00	4131.73	19.73	20	596	519	2.281	44.99	44.99	0.02	
06/08/14	7:10	4154.69	22.96	43	398	483	1.416	32.50	77.50	0.04	
06/08/14	9:15	4156.94	2.25	45	5000	489	18.021	40.55	118.05	0.06	
06/12/14	12:40	4256.45	99.51	144	1817	120	1.607	159.92	277.96	0.14	
06/12/14	12:43	4259.65	3.20	148	1561	117	1.346	4.31	282.27	0.14	
06/13/14	7:15	4274.90	18.45	163	1804	122	1.622	29.93	307.89	0.15	
06/13/14	7:17	4276.27	1.37	164	3390	121	3.023	4.14	312.03	0.16	
06/13/14	7:18	4277.08	0.81	165	2301	120	2.035	1.65	313.68	0.16	
06/19/14	12:05	4422.02	144.94	310	1153	120	1.020	147.81	461.49	0.23	
06/19/14	13:30	4423.74	1.72	312	1117	107	0.881	1.52	463.00	0.23	
06/19/14	16:00	4426.00	2.26	314	1448	121	1.291	2.92	465.92	0.23	
06/24/14	12:05	4543.27	117.27	431	*1440*	*120*	1.274	149.36	615.28	0.31	0.98
06/26/14	12:40	4591.01	165.01	479	1970	127	1.844	304.28	919.56	0.46	
06/26/14	12:42	4593.20	2.19	481	1968	120	1.741	3.81	923.37	0.46	
07/03/14	9:35	4755.92	162.72	644	1650	126	1.532	249.34	1172.71	0.59	
07/03/14	9:37	4757.95	2.03	646	1318	126	1.224	2.48	1175.20	0.59	
07/09/14	11:40	4901.77	143.82	790	875	126	0.812	116.80	1292.00	0.65	
07/09/14	11:42	4903.69	1.92	792	795	124	0.727	1.40	1293.39	0.65	
07/17/14	12:33	5094.48	190.79	982	*790*	124	0.722	137.75	1431.15	0.72	
07/17/14	12:34	5095.13	0.65	983	*790*	127	0.739	0.48	1431.63	0.72	
07/17/14	12:36	5097.75	2.62	986	*790*	127	0.739	1.94	1433.56	0.72	
08/01/14	11:00	5452.10	354.35	1,340	1078	139	1.104	391.35	1824.91	0.91	
08/01/14	11:42	5454.03	1.93	1,342	938	150	1.037	2.00	1826.91	0.91	
08/01/14	11:44	5456.32	2.29	1,344	2314	14	0.239	0.55	1827.46	0.91	
10/10/14	13:00	7118.38	1662.06	3,006	130	51	0.049	81.70	1909.16	0.95	
10/10/14	13:02	7120.15	1.77	3,008	216	58	0.093	0.16	1909.32	0.95	1.86
10/31/14	13:00	7622.85	502.70	3,511	161	48	0.057	28.63	1937.95	0.97	
10/31/14	13:04	7624.49	1.64	3,512	78	54	0.031	0.05	1938.00	0.97	
12/11/14	13:50	8607.53	983.04	4,496	352	***131***	0.340	334.10	2272.11	1.14	
01/15/15	10:11	9441.32	833.79	5,329	47	131	0.045	37.60	2309.70	1.15	
01/15/15	10:12	9442.31	0.99	5,330	173	152	0.194	0.19	2309.89	1.15	
01/15/15	10:15	9445.26	2.95	5,333	388	136	0.389	1.15	2311.04	1.16	
01/29/15	11:50	9778.04	332.78	5,666	240	54	0.095	31.49	2342.53	1.17	
01/29/15	11:52	9780.13	2.09	5,668	239	50	0.088	0.18	2342.72	1.17	0.21
02/26/15	11:00	10448.98	668.85	6,337	72	137	0.073	48.63	2391.35	1.20	
02/26/15	11:02	10450.10	1.12	6,338	178	155	0.204	0.23	2391.57	1.20	
03/12/15	10:15	10780.66	330.56	6,669	483	***155***	0.552	182.40	2573.97	1.29	
04/28/15	8:30	11901.34	1120.68	7,789	126	114	0.106	118.86	2692.84	1.35	
04/28/15	8:36	11907.42	6.08	7,795	132	126	0.123	0.75	2693.58	1.35	
05/14/15	9:05	12285.12	377.70	8,173	96	55	0.039	14.68	2708.26	1.35	
05/14/15	9:10	12290.05	4.93	8,178	105	58	0.045	0.22	2708.48	1.35	1.10
05/28/15	11:30	12623.70	333.65	8,512	6	150	0.006	2.07	2710.55	1.36	
06/11/15	10:39	12650.70	27.00	8,539	318	172	0.403	10.88	2721.43	1.36	
07/02/15	11:00	13154.04	503.34	9,042	85	112	0.070	35.32	2756.75	1.38	0.76
09/03/15	8:00	14662.17	1508.13	10,550	249	104	0.191	287.85	3044.60	1.52	
12/10/15	13:00	17015.28	2353.11	12,903	162	95	0.113	266.92	3311.52	1.66	0.86

Table 1 : Summary of SVE System Field Readings
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Date	Time	Run Time Reading	Operating Hours		Discharge Readings		VOC Discharge				Calculated Correlation Factor
			since last reading	Total	PPM	CFM	lbs/Hr	lbs since last Reading	Total lbs	Total Tons	
03/10/16	12:00	17899.58	884.30	13,788	209	105	0.162	143.03	3454.55	1.73	1.78
06/29/16	8:00	20558.59	2659.01	16,447	156	101	0.116	309.58	3764.13	1.88	3.77
07/27/16	12:30	21232.43	673.84	17,120	126	103	0.095	64.20	3828.33	1.91	
08/25/16	11:00	21927.96	695.53	17,816	115	270	0.229	159.45	3987.78	1.99	1.55
09/22/16	10:20	22596.81	668.85	18,485	169	220	0.274	183.07	4170.85	2.09	
12/08/16	9:30	24443.73	1846.92	20,332	109	220	0.177	327.03	4497.88	2.25	6.59
01/10/17	12:23	24758.20	314.47	20,646	173	233	0.297	93.37	4591.25	2.30	
01/25/17	10:56	25115.43	357.23	21,003	206	179	0.271	96.95	4688.20	2.34	3.06
02/22/17	10:35	25786.27	670.84	21,674	248	214	0.391	262.30	4950.50	2.48	
03/09/17	11:04	26146.82	360.55	22,035	321	209	0.495	178.51	5129.01	2.56	
04/05/17	11:55	26792.33	645.51	22,680	454	113	0.378	244.08	5373.09	2.69	
05/16/17	7:00	26967.77	175.44	22,856	61	198	0.089	15.69	5388.79	2.69	5.78
06/07/17	13:00	27495.83	528.06	23,384	54	221	0.087	46.02	5434.80	2.72	
09/07/17	11:36	29698.50	2202.67	25,587	62	200	0.091	201.31	5636.11	2.82	
09/22/17	11:30	30057.43	358.93	25,945	56	211	0.087	31.26	5667.37	2.83	
10/04/17	10:15	30344.40	286.97	26,232	57	198	0.083	23.87	5691.24	2.85	0.81
11/02/17	13:00	31042.78	698.38	26,931	58	185	0.079	55.23	5746.48	2.87	
12/01/17	12:30	31739.31	696.53	27,627	59	192	0.083	58.16	5804.63	2.90	
12/06/17	12:40	31859.62	120.31	27,748	6	270	0.011	1.36	5806.00	2.90	
12/18/17	15:00	32149.36	289.74	28,037	60	208	0.092	26.65	5832.65	2.92	
01/09/18	10:00	32672.25	522.89	28,560	52	189	0.072	37.88	5870.52	2.94	
01/26/18	10:15	33080.48	408.23	28,968	48	172	0.061	24.84	5895.36	2.95	
02/09/18	13:10	33416.85	336.37	29,305	32	220	0.052	17.45	5912.82	2.96	0.19
02/23/18	11:15	33753.60	336.75	29,642	34	186	0.047	15.70	5928.51	2.96	
03/07/18	10:55	34040.75	287.15	29,929	52	227	0.087	24.98	5953.50	2.98	
03/16/18	13:03	34251.67	210.92	30,140	48	195	0.069	14.55	5968.05	2.98	
								Corrected Total:	11,568.82	5.68	

Notes:

1. Color shading indicates air sampling period with a unique correlation
2. During the June 24 & July 17, 2014 site visit the field readings were not recorded. The italicized values presented above for these dates are conservative estimated values based upon last known readings.

Table 2 : Summary of Laboratory Analytical Results for Discharge Air Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Parameters	Sample ID:	SVE	Canister #34000823 Serial C8528 2014-12-11	CANISTER #C8522	Canister #8408 2015-06-11 Air Sample	Canister #5451 Batch #320-14155 9-3-15	CANISTER #34000512 BATCH ID #320-15930	STATE M-1 LEASE	20160629 M SVE	20160922 M SVE	20161208 M SVE	20170309 M SVE	20170607M SVE	20170907 M SVE	20171206 -M-SVE	20180307-M-SVE
	Sample Date:	1-Aug-14	11-Dec-14	12-Mar-15	11-Jun-15	3-Sep-15	10-Dec-15	10-Mar-16	29-Jun-16	22-Sep-16	8-Dec-16	9-Mar-17	7-Jun-17	7-Sep-17	6-Dec-17	7-Mar-18
Volatile Organic Compounds by TO-15																
Acetone	ppb v/v	<2000	<615	<965	<860	<615	<370	<915	<280	<175	<106	<203	<76.0	<116	<20.0	**5.67**
Benzene	ppb v/v	**8,820**	**2,960**	**533**	**3,630**	**312**	**194**	**1,070**	**2,600**	**853**	**373**	**550**	**180**	**143**	**1.77**	**24.5**
Benzyl chloride	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Bromodichloromethane	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	103.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
Bromoform	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Bromomethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
2-Butanone (MEK)	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	**178**	<3.20	<0.800
Carbon disulfide	ppb v/v	**1,800**	**272**	<154	<138	<98.4	<59.2	<146	**177**	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Carbon tetrachloride	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Chlorobenzene	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
Dibromochloromethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Chloroethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Chloroform	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
Chloromethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
1,2-Dibromoethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
1,2-Dichlorobenzene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,3-Dichlorobenzene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,4-Dichlorobenzene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Dichlorodifluoromethane	ppb v/v	**1,980**	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,1-Dichloroethane	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300
1,2-Dichloroethane	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	**0.881**
1,1-Dichloroethene	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
cis-1,2-Dichloroethene	ppb v/v	<160	<49.2	**84.5**	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
trans-1,2-Dichloroethene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,2-Dichloropropane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
cis-1,3-Dichloropropene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
trans-1,3-Dichloropropene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Ethylbenzene	ppb v/v	**13,500**	**3,830**	**799**	**2,890**	**731**	**723**	**446**	**2,530**	**1,390**	**531**	**908**	**229**	**219**	**4.75**	**25.4**
4-Ethyltoluene	ppb v/v	**974**	**533**	**164**	**299**	**256**	**186**	<73.2	**660**	**497**	**135**	**263**	**58.5**	**45.1**	**2.38**	**3.74**
Hexachlorobutadiene	ppb v/v	<800	<246	<386	<344	<246	<148	<366	<112	<69.8	<42.2	<81.0	<30.4	<46.2	<8.00	<2.00
2-Hexanone	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Methylene Chloride	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	**0.540**
4-Methyl-2-pentanone	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Styrene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,1,2,2-Tetrachloroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	**41.1**	<14.0	<8.44	<16.2	---	<9.24	<1.60	<0.400
Tetrachloroethene	ppb v/v	<160	**71.9**	<77.2	<68.8	<49.2	<29.6	**92.9**	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Toluene	ppb v/v	**4,020**	**1,040**	**228**	**1,480**	<49.2	<29.6	**120**	**975**	**380**	**164**	**193**	**68.4**	**49.2**	<1.60	**6.92**
1,2,4-Trichlorobenzene	ppb v/v	<800	<246	<386	<344	<246	<148	<366	<112	<69.8	<42.2	<81.0	<30.4	<46.2	<8.00	<2.00
1,1,1-Trichloroethane	ppb v/v	<120	<36.9	<57.9	<51.6	<36.9	<22.2	<54.9	<16.8	<10.5	<6.33	<12.2	<4.56	<6.93	<1.20	<0.300

Table 2 : Summary of Laboratory Analytical Results for Discharge Air Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Parameters	*Sample ID:*	SVE	Canister #34000823 Serial C8528 2014-12-11	CANISTER #C8522	Canister #8408 2015-06-11 Air Sample	Canister #5451 Batch #320-14155 9-3-15	CANISTER #34000512 BATCH ID #320-15930	STATE M-1 LEASE	20160629 M SVE	20160922 M SVE	20161208 M SVE	20170309 M SVE	20170607M SVE	20170907 M SVE	20171206 -M-SVE	20180307-M-SVE
	Sample Date:	**1-Aug-14**	**11-Dec-14**	**12-Mar-15**	**11-Jun-15**	**3-Sep-15**	**10-Dec-15**	**10-Mar-16**	**29-Jun-16**	**22-Sep-16**	**8-Dec-16**	**9-Mar-17**	**7-Jun-17**	**7-Sep-17**	**6-Dec-17**	**7-Mar-18**
1,1,2-Trichloroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Trichloroethene	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
Trichlorofluoromethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.4	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
1,2,4-Trimethylbenzene	ppb v/v	**2,020**	**648**	**299**	**774**	<98.4	**355**	<146	**968**	**740**	**228**	**411**	**85.9**	**50.3**	**7.35**	**9.05**
1,3,5-Trimethylbenzene	ppb v/v	**820**	**385**	**172**	**353**	**73.0**	**247**	<73.2	**737**	**541**	**192**	**397**	**53.6**	**45.5**	**6.18**	**5.81**
Vinyl acetate	ppb v/v	<320	<98.4	<154	<138	<98.4	<59.2	<146	<44.8	<27.9	<16.9	<32.4	<12.2	<18.5	<3.20	<0.800
Vinyl chloride	ppb v/v	<160	<49.2	<77.2	<68.8	<49.2	<29.6	<73.2	<22.8	<14.0	<8.44	<16.2	<6.08	<9.24	<1.60	<0.400
m,p-Xylene	ppb v/v	**12,700**	**4,680**	**1,110**	**3,920**	**1,140**	**1,380**	**609**	**5,050**	**2,550**	**870**	**1,510**	**322**	**330**	**10.3**	**46**
o-Xylene	ppb v/v	**4,520**	**1,190**	**286**	**1,120**	**164**	**194**	**107**	**720**	**419**	**177**	**337**	**98.4**	**96.4**	**2.54**	**15.6**
Total VOC as Hexane (C6-C12)	ppb v/v	**1,060,000**	**655,000**	**99,400**	**351,000**	**190,000**	**140,000**	**371,000**	**590,000**	**262,000**	**720,000**	**985,000**	**54,500**	**40,900**	**4,630**	**9,930**

Table 3 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-1R	3888.97	06/03/14	44.57	49.89	5.32	3839.08
	3888.97	09/22/14	44.87	48.91	4.04	3840.06
	3888.97	12/10/14	45.80	46.30	0.50	3842.67
	3888.97	03/11/15	45.12	46.83	1.71	3842.14
	3888.97	06/10/15	45.54	46.31	0.77	3842.66
	3888.97	09/02/15	45.81	47.37	1.56	3841.60
	3888.97	12/09/15	45.22	49.07	3.85	3839.90
	3888.97	03/09/16	45.30	47.18	1.88	3841.79
	3888.97	06/28/16	45.75	47.02	1.27	3841.95
	3888.97	09/21/16	46.10	46.38	0.28	3842.59
	3888.97	12/07/16	46.13	46.88	0.75	3842.09
	3888.97	03/08/17	46.14	46.57	0.43	3842.40
	3888.97	06/06/17	45.82	48.86	3.04	3840.11
	3888.97	09/08/17	46.30	46.63	0.33	3842.34
	3888.97	12/04/17	46.36	46.77	0.41	3842.20
	3888.97	03/05/18	46.47	46.81	0.34	3842.16
MW-2	3890.51	06/03/14	--	47.23	--	3843.28
	3890.51	09/22/14	--	46.37	--	3844.14
	3890.51	12/10/14	--	45.91	--	3844.60
	3890.51	03/11/15	--	46.03	--	3844.48
	3890.51	06/10/15	--	46.38	--	3844.13
	3890.51	09/02/15	--	46.44	--	3844.07
	3890.51	12/09/15	--	46.51	--	3844.00
	3890.51	03/09/16	--	46.61	--	3843.90
	3890.51	06/28/16	--	46.70	--	3843.81
	3890.51	09/21/16	--	46.80	--	3843.71
	3890.51	12/07/16	--	46.82	--	3843.69
	3890.51	03/08/17	--	46.88	--	3843.63
	3890.51	06/06/17	--	46.98	--	3843.53
	3890.51	09/08/17	--	47.06	--	3843.45
	3890.51	12/04/17	--	47.11	--	3843.40
	3890.51	03/05/18	--	47.22	--	3843.29
MW-3	3889.34	06/03/14	--	46.35	--	3842.99
	3889.34	09/22/14	--	46.49	--	3842.85
	3889.34	12/10/14	--	46.08	--	3843.26
	3889.34	03/11/15	--	46.28	--	3843.06
	3889.34	06/10/15	--	46.51	--	3842.83
	3889.34	09/02/15	--	46.60	--	3842.74
	3889.34	12/09/15	--	46.68	--	3842.66
	3889.34	03/09/16	--	46.72	--	3842.62
	3889.34	06/28/16	--	46.85	--	3842.49
	3889.34	09/21/16	--	46.96	--	3842.38
	3889.34	12/07/16	--	47.02	--	3842.32
	3889.34	03/08/17	--	47.11	--	3842.23
	3889.34	06/06/17	--	47.13	--	3842.21
	3889.34	09/08/17	--	47.23	--	3842.11
	3889.34	12/04/17	--	47.28	--	3842.06
	3889.34	03/05/18	--	47.44	--	3841.90

Table 3 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-4	3888.90	06/03/14	--	46.38	--	3842.52
	3888.90	09/22/14	--	46.50	--	3842.40
	3888.90	12/10/14	--	46.14	--	3842.76
	3888.90	03/11/15	--	46.35	--	3842.55
	3888.90	06/10/15	--	46.49	--	3842.41
	3888.90	09/02/15	--	46.57	--	3842.33
	3888.90	12/09/15	--	46.68	--	3842.22
	3888.90	03/09/16	--	46.75	--	3842.15
	3888.90	06/28/16	--	46.87	--	3842.03
	3888.90	09/21/16	--	46.94	--	3841.96
	3888.90	12/07/16	--	47.03	--	3841.87
	3888.90	03/08/17	--	47.08	--	3841.82
	3888.90	06/06/17	--	47.15	--	3841.75
	3888.90	09/08/17	--	47.24	--	3841.66
	3888.90	12/04/17	--	47.29	--	3841.61
	3888.90	03/05/18	--	47.38	--	3841.52
MW-5	3890.41	06/03/14	--	46.56	--	3843.85
	3890.41	09/22/14	--	46.70	--	3843.71
	3890.41	12/10/14	--	46.29	--	3844.12
	3890.41	03/11/15	--	46.44	--	3843.97
	3890.41	06/10/15	--	46.69	--	3843.72
	3890.41	09/02/15	--	46.79	--	3843.62
	3890.41	12/09/15	--	46.85	--	3843.56
	3890.41	03/09/16	--	46.90	--	3843.51
	3890.41	06/28/16	--	47.08	--	3843.33
	3890.41	09/21/16	--	47.13	--	3843.28
	3890.41	12/07/16	--	47.14	--	3843.27
	3890.41	03/08/17	--	47.23	--	3843.18
	3890.41	06/06/17	--	47.32	--	3843.09
	3890.41	09/08/17	--	47.40	--	3843.01
	3890.41	12/04/17	--	47.27	--	3843.14
	3890.41	03/05/18	--	47.54	--	3842.87
MW-6	3888.25	06/03/14	--	46.25	--	3842.00
	3888.25	09/22/14	--	46.39	--	3841.86
	3888.25	12/10/14	--	46.09	--	3842.16
	3888.25	03/11/15	--	46.23	--	3842.02
	3888.25	06/10/15	--	46.32	--	3841.93
	3888.25	09/02/15	--	46.48	--	3841.77
	3888.25	12/09/15	--	46.57	--	3841.68
	3888.25	03/09/16	--	46.62	--	3841.63
	3888.25	06/28/16	--	46.74	--	3841.51
	3888.25	09/21/16	--	46.81	--	3841.44
	3888.25	12/07/16	--	46.90	--	3841.35
	3888.25	03/08/17	--	46.93	--	3841.32
	3888.25	06/06/17	--	47.08	--	3841.17
	3888.25	09/08/17	--	47.12	--	3841.13
	3888.25	12/04/17	--	47.21	--	3841.04
	3888.25	03/05/18	--	47.30	--	3840.95

Table 3 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-7	3889.23	06/03/14	--	45.94	--	3843.29
	3889.23	09/22/14	--	46.08	--	3843.15
	3889.23	12/10/14	--	45.70	--	3843.53
	3889.23	03/11/15	--	45.36	--	3843.87
	3889.23	06/10/15	--	46.08	--	3843.15
	3889.23	09/02/15	--	46.14	--	3843.09
	3889.23	12/09/15	--	46.24	--	3842.99
	3889.23	03/09/16	--	46.30	--	3842.93
	3889.23	06/28/16	--	46.42	--	3842.81
	3889.23	09/21/16	--	46.52	--	3842.71
	3889.23	12/07/16	--	46.59	--	3842.64
	3889.23	03/08/17	--	46.65	--	3842.58
	3889.23	06/06/17	--	46.73	--	3842.50
	3889.23	09/08/17	--	46.80	--	3842.43
	3889.23	12/04/17	--	46.88	--	3842.35
	3889.23	03/05/18	--	46.96	--	3842.27
MW-8	3887.06	06/03/14	--	44.94	--	3842.12
	3887.06	09/22/14	--	45.11	--	3841.95
	3887.06	12/10/14	--	44.79	--	3842.27
	3887.06	03/11/15	--	44.94	--	3842.12
	3887.06	06/10/15	--	45.22	--	3841.84
	3887.06	09/02/15	--	45.21	--	3841.85
	3887.06	12/09/15	--	45.29	--	3841.77
	3887.06	03/09/16	--	45.35	--	3841.71
	3887.06	06/28/16	--	45.56	--	3841.50
	3887.06	09/21/16	--	45.67	--	3841.39
	3887.06	12/07/16	--	45.64	--	3841.42
	3887.06	03/08/17	--	45.68	--	3841.38
	3887.06	06/06/17	--	45.78	--	3841.28
	3887.06	09/08/17	--	45.82	--	3841.24
	3887.06	12/04/17	--	45.91	--	3841.15
	3887.06	03/05/18	--	46.03	--	3841.03

Notes:
1. TOC : Measured from top of casing.
2. LNAPL : Light non aqueous phase liquid.
3. -- : Denotes Not Measured.
4. AMSL : Denotes above mean sea level (AMSL)

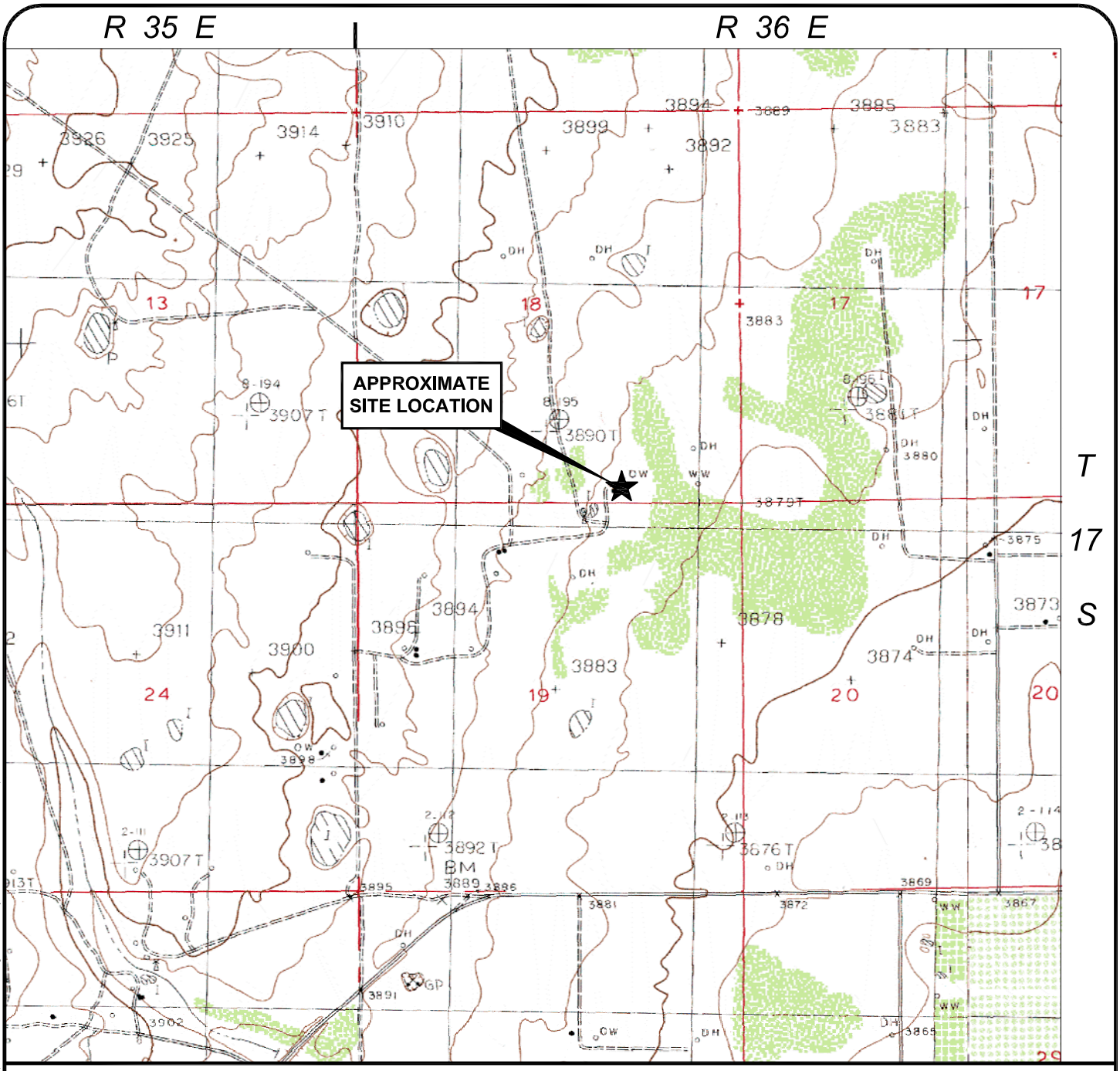
Table 4 : Summary of Laboratory Analytical Results for Groundwater Samples
Chesapeake Energy Corporation, State M Lease (AP-72)
Lea County, New Mexico

	Chloride (mg/L)															
	June 2014	**Sept. 2014**	**Dec. 2014**	**March 2015**	**June 2015**	**Sept. 2015**	**Dec. 2015**	**March 2016**	**June 2016**	**Sept. 2016**	**Dec. 2016**	**March 2017**	**June 2017**	**Sept. 2017**	**Dec. 2017**	**March 2018**
MW-1R	---	51.4	116	39.0	24.6	21.6	23.5	34.8	24.9	28.5	44.8	32.0	28.6	29.3	29.0	33.7
MW-2	17.7	17.4	18.3	16.6	16.8	16.6	15.4 *	13.5	18.9	17.6	18.2	15.0	15.9	15.2	16.2	16.6
MW-3	59.7	59.7	58.9	57.0	57.1	56.3	50.5 *	49.3	51.5	52.0	55.1	50.0	53.7	49.5	58.1	64.3
MW-4	**586**	**534**	**535**	**543**	**556**	**567**	**546 ***	**525**	**527**	**569**	**605**	**500**	**493**	**465**	**492**	**484**
MW-5	28.6	27.3	27.9	26.1	26.2	25.8	22.4 *	22.4	26.1	26.2	27.8	23.1	24.7	20.4	25.4	25.9
MW-6	**282**	**263**	**268**	**261**	**253**	**277**	197 *	150	128	128	125	94.4	86.3	79.3	71.8	64.7
MW-7	42.7	29.6	36.0	39.7	36.2	35.2	28.8 *	27.7	36.0	38.2	39.6	24.2	23.8	24.0	27.7	31.6
MW-8	**409**	**442**	**463**	**485**	**558**	**327**	**499**	**504**	**539**	**490**	**768**	**489**	**531**	**573**	**570**	**587**

Notes:

1. mg/L : milligrams per liter.
2. < : Analyte not detected at the laboratory reporting limit.
3. All analyses performed by TestAmerica Laboratories in Nashville, Tennessee.
4. Cells shaded in blue indicate results that are above the laboratory reporting limit.
5. Cells with text **bolded** indicate results that exceed the New Mexico Administrative Code 20.6.2.3103, Standards for Groundwater: chloride (250.0 mg/L).
6. --- : Analysis not performed.
7. * : Analysis performed outside of holding time.
8. December 2016 results for MW-1R and MW-8 were confirmed by laboratory. reanalysis.
9. Sample MW-1R was collected in December 2017 under sample ID MW-R1 as shown on the COC and in the field book.

FIGURES



SOURCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLES
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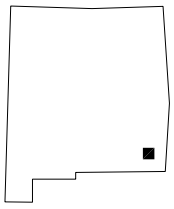
LOVINGTON SE, NEW MEXICO - PROVISIONAL EDITION 1985

NEW MEXICO



SCALE
0 1/2 1 MILE

N

CLIENT CHESAPEAKE ENERGY CORPORATION, LLC OKLAHOMA CITY, OKLAHOMA	FIGURE TITLE ***SITE LOCATION AND TOPOGRAPHIC FEATURES***
LOCATION STATE M LEASE (AP-73) SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO	DOCUMENT TITLE FOURTH ANNUAL GROUNDWATER MONITORING REPORT

ENVIRO CLEAN CARDINAL

Enviro Clean Cardinal, LLC
7060 South Yale Avenue, Suite 603
Tulsa, Oklahoma 74136
918.794.7828
www.EnviroCleanPS.com

		DESIGNED BY	BEM
DATE	5/14/2018	APPROVED BY	BEM
SCALE	AS SHOWN	DRAWN BY	SKG
PROJECT NUMBER		FIGURE NUMBER	
CHKHSTM101		1	

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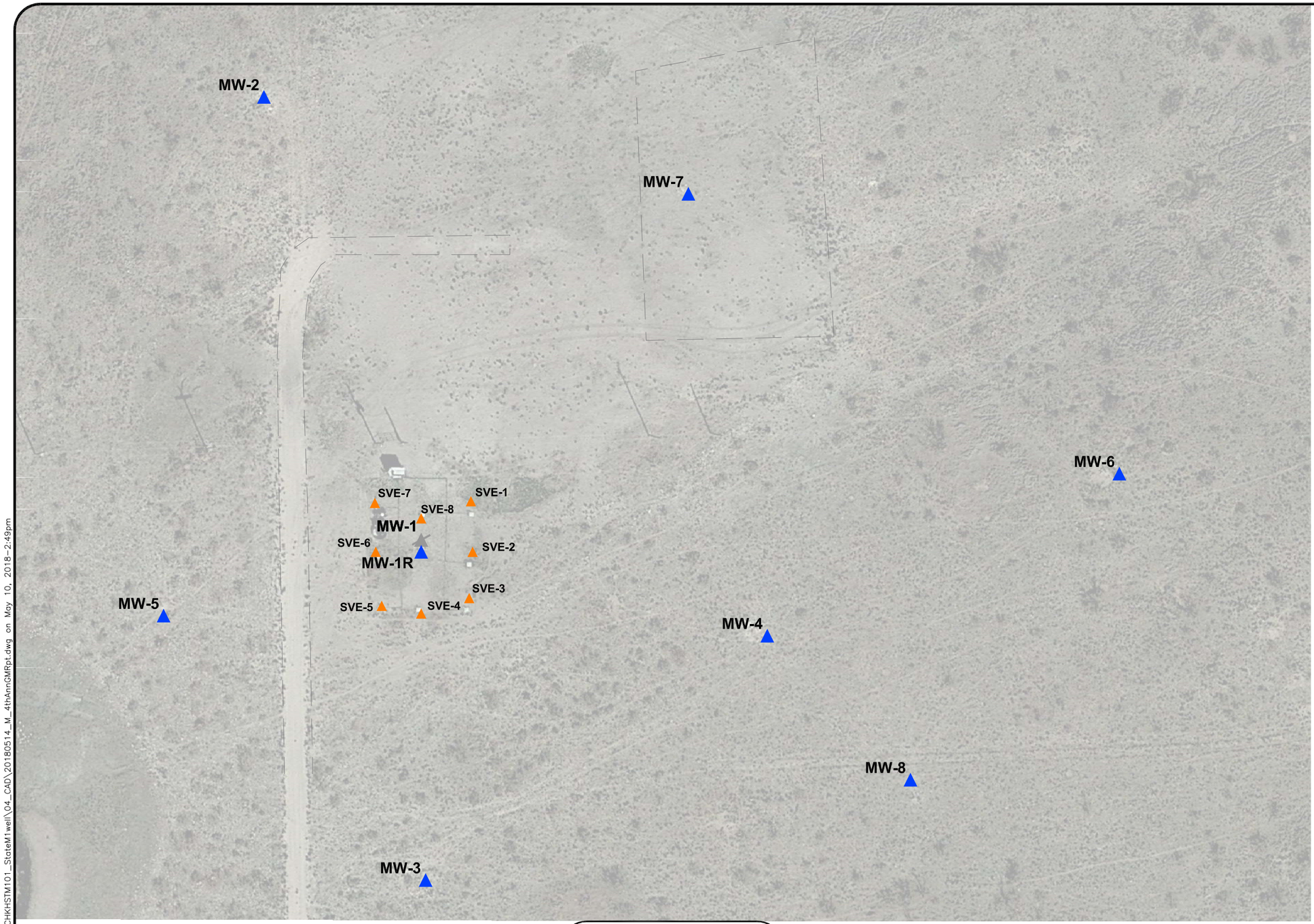

LEGEND

- MW-5 — LOCATION OF MONITORING WELL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- SVE-1 — LOCATION OF SVE SYSTEM WELL

N

30 0 30 60
SCALE FEET

SOURCE: AERIAL PHOTOGRAPH DATED FEBRUARY 1, 2017, GOOGLE EARTH PRO SCREEN CAPTURE

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DOCUMENT TITLE: FOURTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***SITE BASE MAP***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	2

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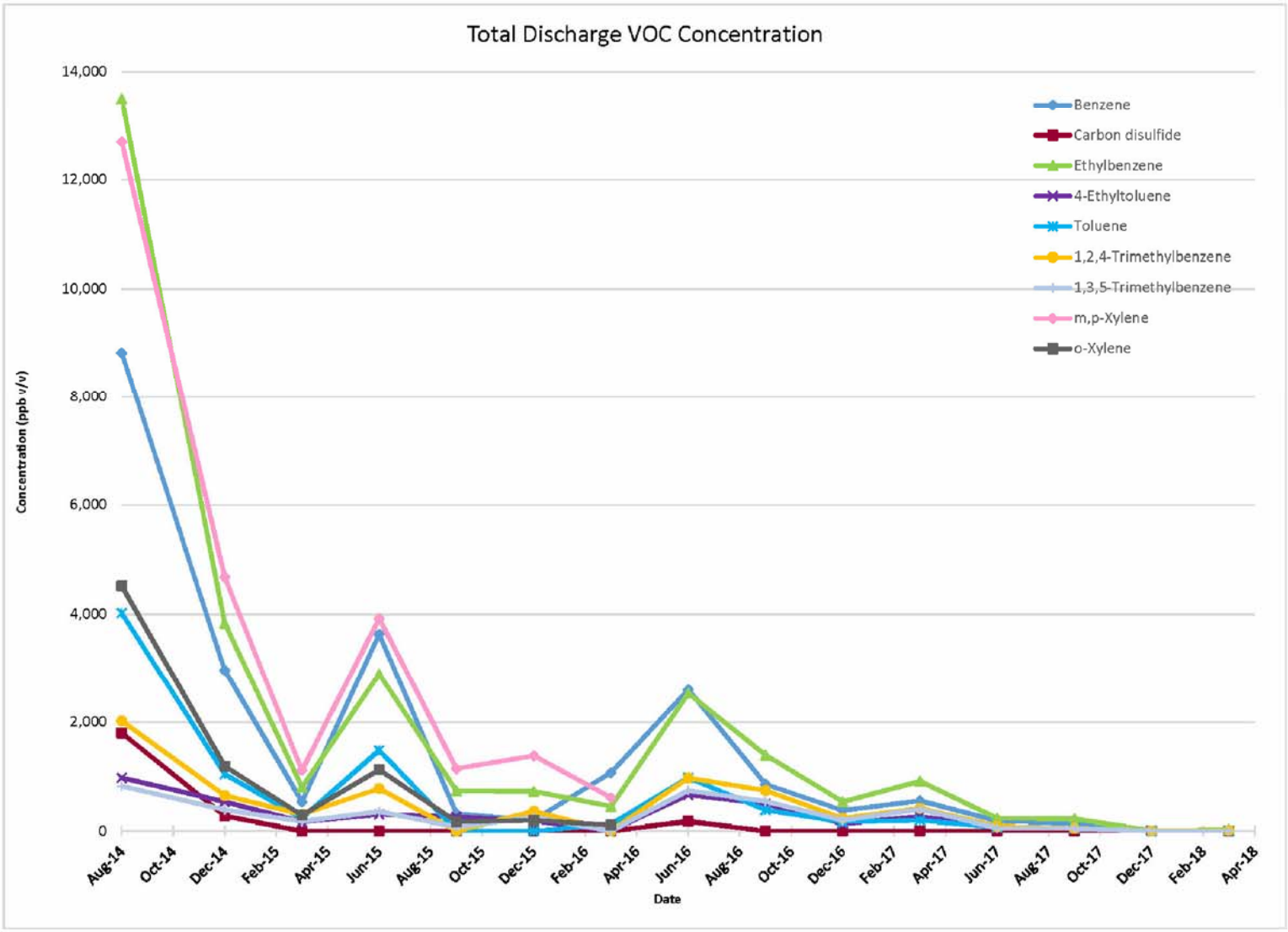

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DOCUMENT TITLE
FOURTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE
SVE SYSTEM VOC DISCHARGE CONCENTRATIONS VERSUS TIME

CLIENT
CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION
STATE M LEASE (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	CNA		
APPROVED BY	BEM	SCALE	NTS
DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
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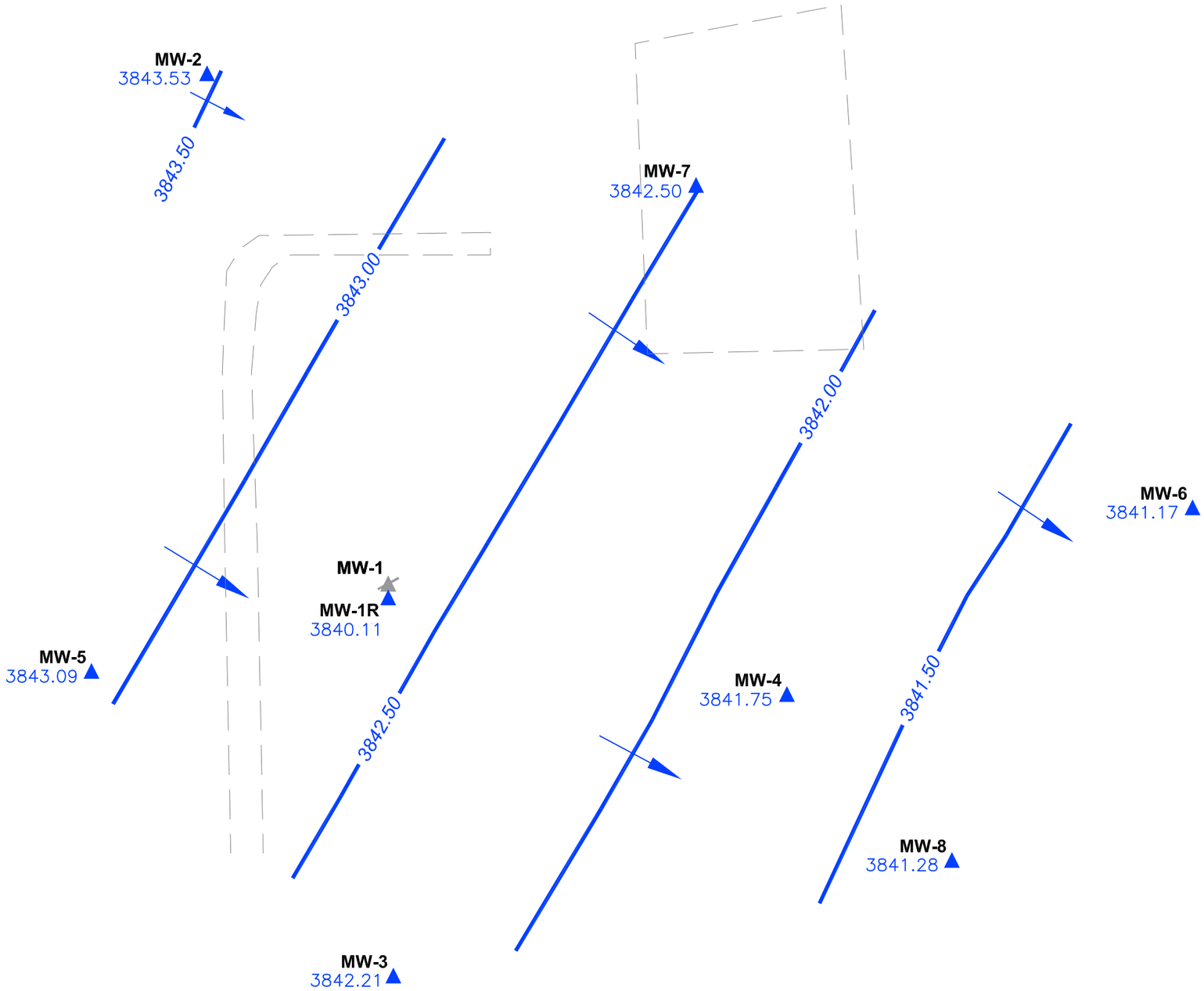

LEGEND

- **MW-5** 3843.09 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 6/6/2017, FEET AMSL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

N

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SCALE FEET

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DOCUMENT TITLE: FOURTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, JUNE 6, 2017***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

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DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
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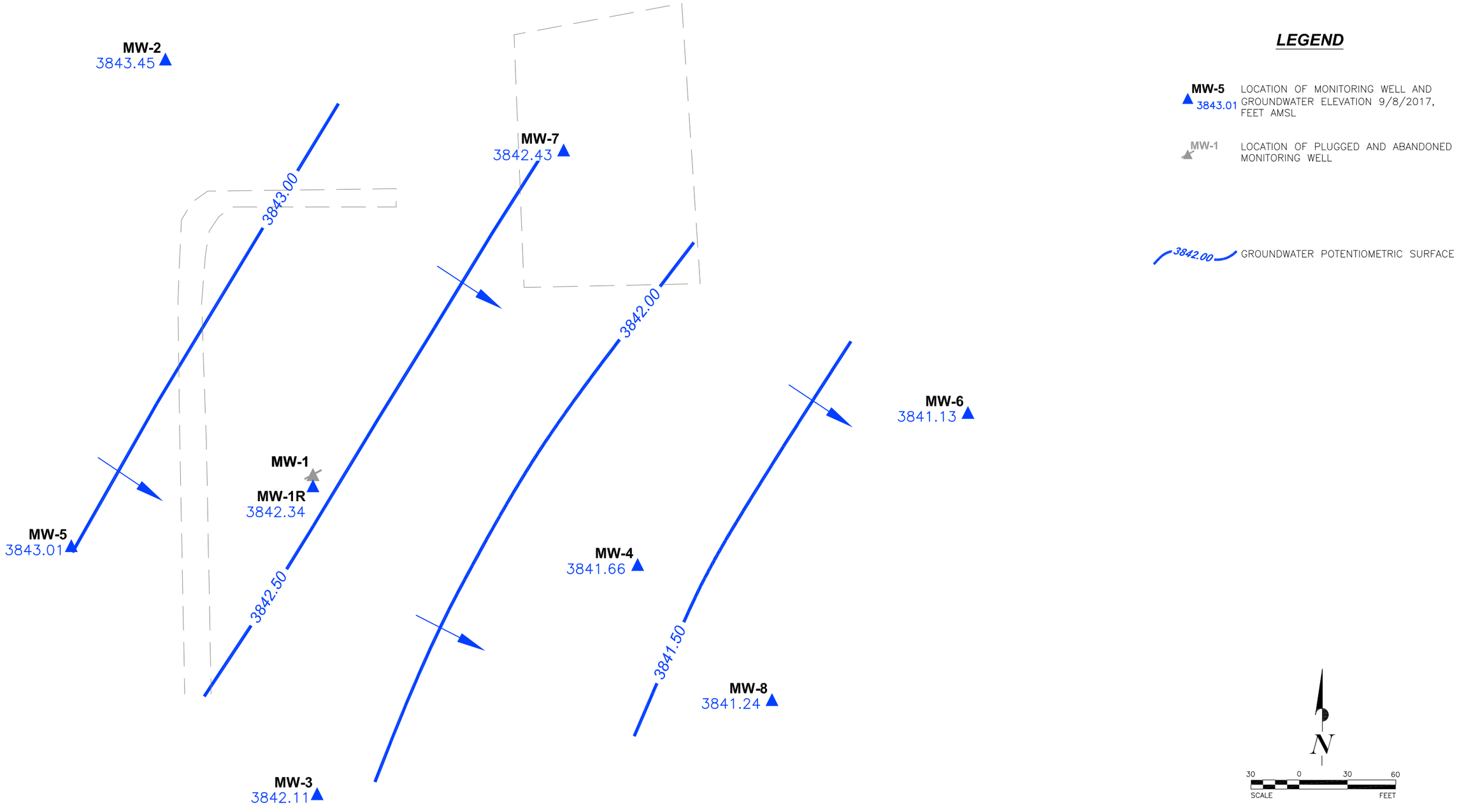

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DOCUMENT TITLE	FOURTH ANNUAL GROUNDWATER MONITORING REPORT
FIGURE TITLE	***GROUNDWATER POTENTIOMETRIC SURFACE, SEPTEMBER 8, 2017***
CLIENT	CHESAPEAKE ENERGY CORPORATION OKLAHOMA CITY, OKLAHOMA
LOCATION	STATE M LEASE (AP-72) SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
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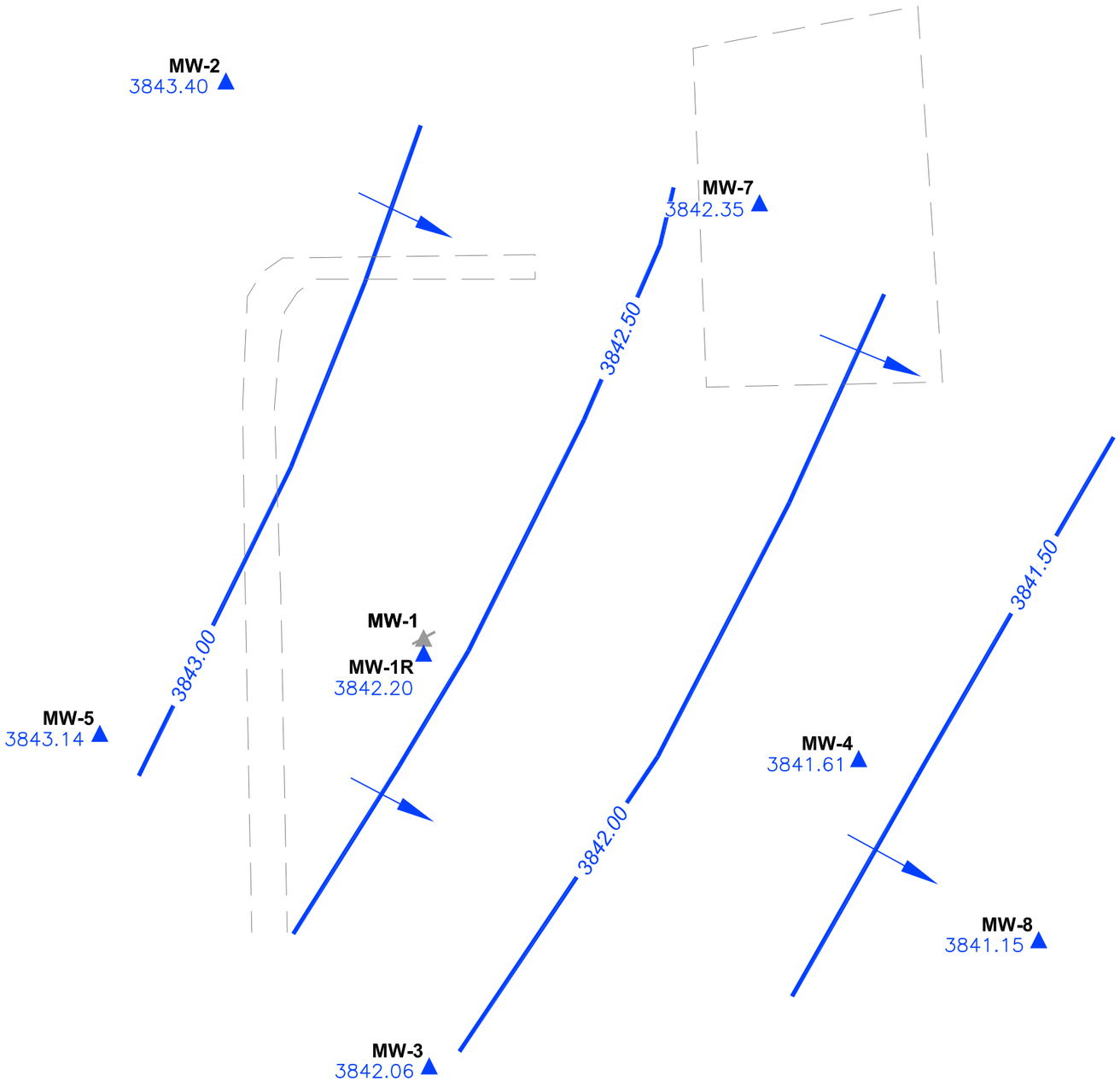

LEGEND

- **MW-5** 3843.14 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 12/4/2017, FEET AMSL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

N

30 0 30 60
SCALE FEET

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DOCUMENT TITLE: FOURTH ANNUAL GROUNDWATER MONITORING REPORT

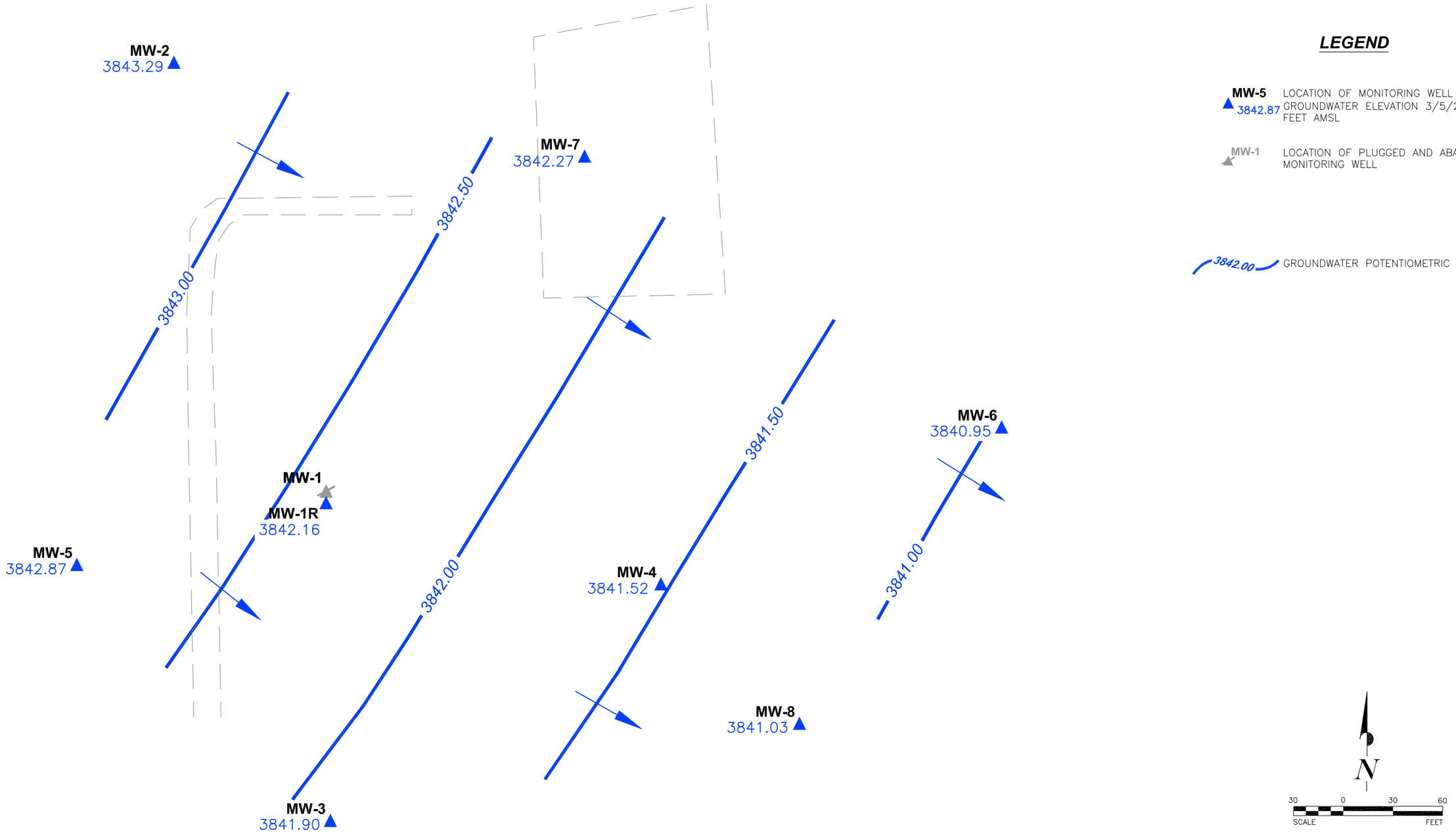
FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, DECEMBER 4, 2017***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	6



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DOCUMENT TITLE
FOURTH ANNUAL GROUNDWATER MONITORING REPORT

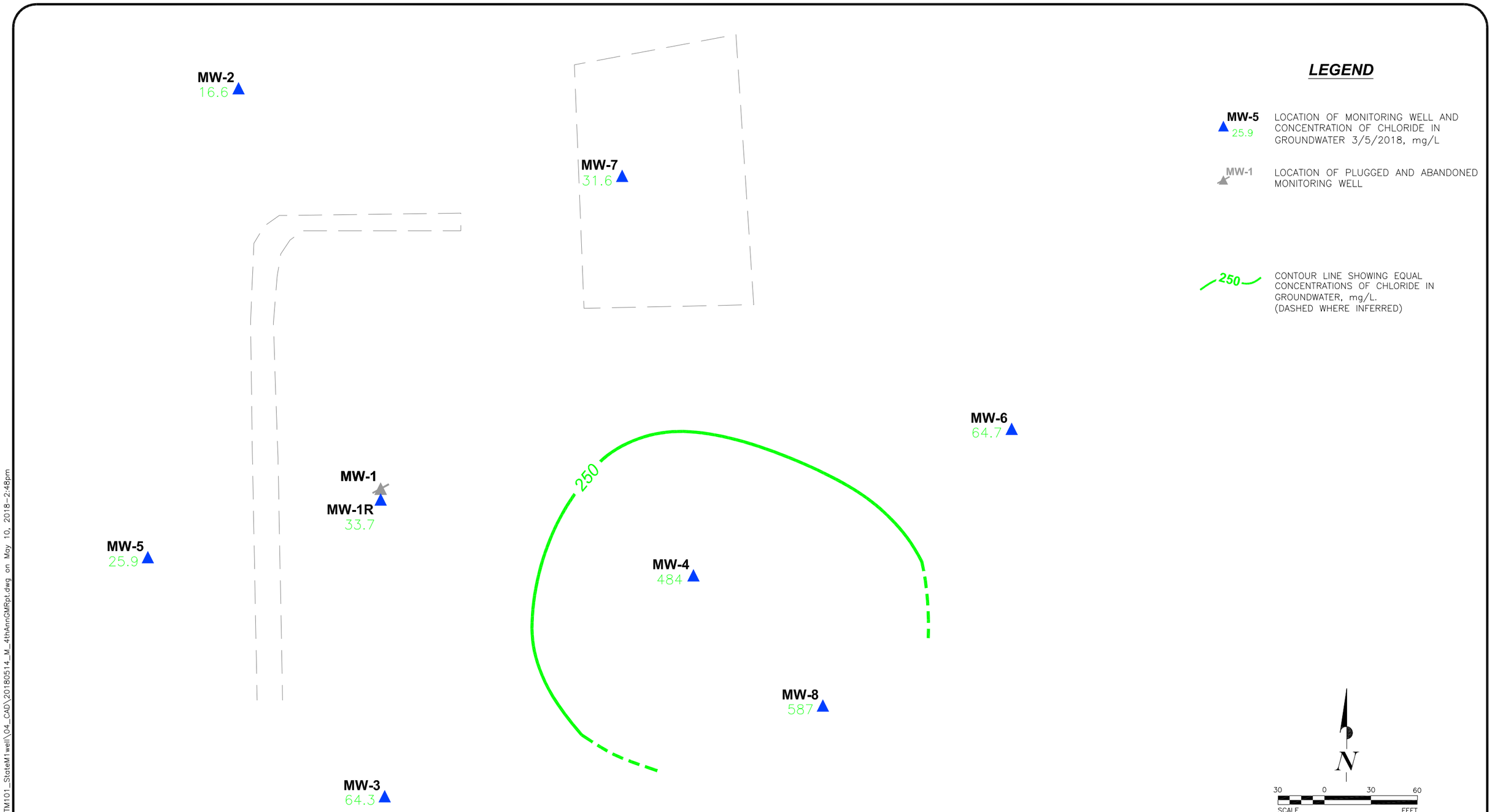
FIGURE TITLE
GROUNDWATER POTENTIOMETRIC SURFACE, MARCH 5, 2018

CLIENT
CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION
STATE M LEASE (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	7



LEGEND

MW-5 25.9 — LOCATION OF MONITORING WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER 3/5/2018, mg/L

MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL

250 — CONTOUR LINE SHOWING EQUAL CONCENTRATIONS OF CHLORIDE IN GROUNDWATER, mg/L. (DASHED WHERE INFERRED)

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DOCUMENT TITLE: FOURTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE: ***ISOPLETH OF CHLORIDE CONCENTRATIONS IN GROUNDWATER, MARCH 5, 2018***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M LEASE (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

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APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	8

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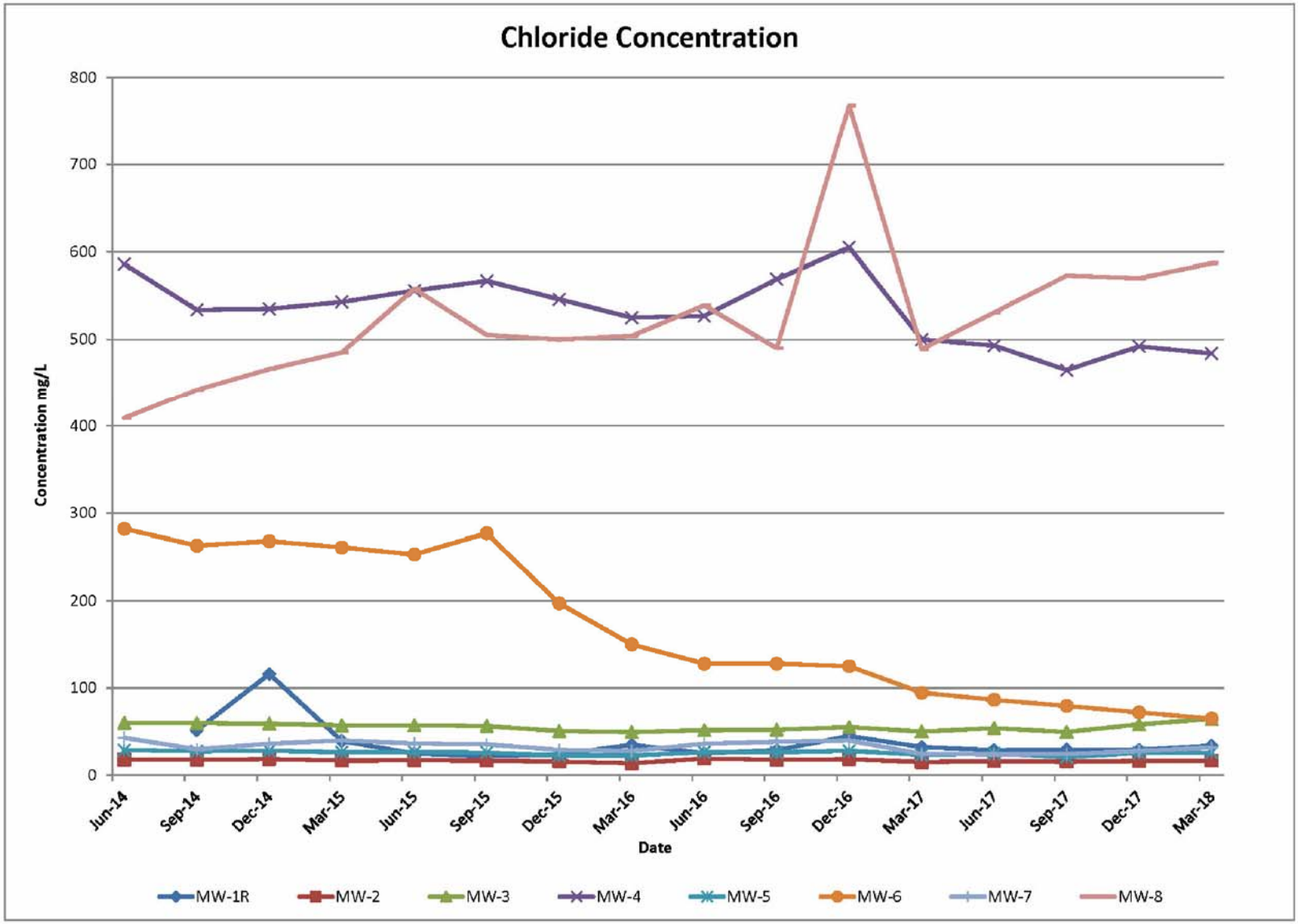

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DOCUMENT TITLE
FOURTH ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE
CHLORIDE CONCENTRATION TREND GRAPHS

CLIENT CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION STATE M LEASE (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	CNA		
APPROVED BY	BEM	SCALE	NTS
DRAWN BY	SKG	DATE	5/14/2018

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	9

APPENDICES

A Stage 2 Abatement Plan

B NMOCD Approval of Stage 2 Abatement Plan

C Laboratory Analytical Reports and Chain-of-Custody Documentation

APPENDIX A

STAGE 2 ABATEMENT PLAN

ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS U.S., Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432 687 5400
Fax 432 687 5401
www.arcadis-us.com

ENVIRONMENT

Mr. Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Subject:
State M-1 AP-072
Stage 2 Abatement Plan

Date:
March 27, 2012

Dear Mr. Von Gonten:

On behalf of Chesapeake Energy Corporation, ARCCADIS U.S. Inc. respectfully submits the enclosed Stage 2 Abatement plan for the State M-1 site (AP-072). A Stage 1 Abatement Plan Report was submitted on March 20, 2012. Your review and approval of this Abatement Plan will be appreciated. The landowner, Darr Angell, is anxious for us to complete soil remediation at this site.

If you have any questions please do not hesitate to contact Bradley Blevins at (575) 391-1462 or via e-mail at bblevins@chkenergy or me at (432) 687-5400, e-mail address shall@aracdis-us.com.

Contact:
Sharon Hall

Phone:
432 687-5400

Email:
shall@aracdis-us.com

Our ref:
MT001088

ARCADIS U.S., Inc.
TX Engineering License # F-533

Sincerely,

ARCADIS U.S., Inc.

Sharon E. Hall

Sharon E. Hall
Associate Vice President

Copies:
Bradley Blevins- Chesapeake, Hobbs

ARCADIS
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Imagine the result

Chesapeake Energy Corporation

State M-1 AP-072
Stage 2 Abatement
Plan Proposal

Hobbs, New Mexico

March 27, 2012

ARCADIS

Sharon Hall
Associate Vice President

State M-1 AP-072

Stage 2 Abatement
Plan Proposal

Prepared for:
Chesapeake Energy
Corporation
Hobbs, New Mexico

Prepared by:
ARCADIS U.S., Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432 687 5400
Fax 432 687 5401

Our Ref.:
MT001088.0001.00001

Date:
March 27, 2012

Table of Contents

Figures

Appendices

ARCADIS

1. INTRODUCTION

The subject site is a former tank battery site located east of Buckeye, New Mexico. The site was purchased by Chesapeake Energy Corporation (Chesapeake) in April 2004. Chesapeake did not operate the tank battery or the associated well field and began the process of facility abandonment in 2007.

Seven monitor wells and nine soil borings have been drilled at the site. Elevated chloride concentrations and limited hydrocarbon compounds were detected in soil samples collected from soil borings and monitoring wells. Elevated chlorides were detected in the down gradient monitor wells and light non-aqueous phase liquid (LNAPL) occurs in monitoring well MW-1. LNAPL recovery activities have been piloted at the site and will commence again upon completion of surface reclamation activities.

2. SUMMARY OF STAGE 1 ABATEMENT ACTIVITIES

Initial site investigation activities were conducted in May of 2007 following abandonment of the tank battery. Stage 1 Abatement activities were conducted during the period of May 2007 through September 2011. Stage 1 Abatement activities included drilling and soil sampling of nine boreholes, drilling and sampling of seven monitor wells, EM 31 and EM 34 surveys, conversion of one monitoring well into a recovery well and recovery of phase-separated hydrocarbons from the recovery well.

New Mexico Oil Conservation Division (NMOCD) was notified of impacts to groundwater at the site via e-mail on May 30, 2007. NMOCD notified Chesapeake in a letter dated June 19, 2007 that a Stage 1 Abatement Plan was required for the site in accordance with Rule 19.

The Stage 1 Abatement Plan was submitted to NMOCD on August 22, 2007. The plan summarized site activities taken to date. The plan proposed the drilling and sampling of a minimum of three additional soil borings and installation and sampling of nine groundwater monitoring wells.

BBC contacted NMOCD via email on April 24, 2010 to inquire about the status of the Stage 1 Abatement Plan approval and Chesapeake's desire to conduct the proposed Stage 1 Abatement Plan activities. On May 27, 2010, NMOCD responded via email that the State was not staffed to review the Abatement Plans (APs) in a timely manner. On June 23, 2010, BBC contacted NMOCD via email to request a waiver of the Public Notice requirement and inform NMOCD that Chesapeake and the landowner were

anxious to move forward with the proposed AP activities. NMOCD replied via email on June 23, 2010 stating they were still understaffed to review the AP and could not waive the Public Notice requirement. They advised BBC that Chesapeake could proceed "at risk." On July 12, 2010 BBC informed NMOCD by registered letter that Chesapeake was planning to start the Stage 1 Assessment on or about August 23, 2010. They further informed NMOCD they would be submitting the required Public Notices, a copy of which was attached to the letter. NMOCD did not respond to the registered letter.

The public notices were published in the Hobbs News-Sun and Lovington Leader on July 22, 2010 and the Albuquerque Journal on July 24, 2010. No comments were received from the public or NMOCD during the 30-day comment period and Chesapeake proceeded with the proposed Stage 1 Abatement Plan activities on August 26, 2010. Copies of correspondence and Public Notice are included in Appendix A.

A detailed description of site activities and results can be found in the report submitted to NMOCD dated March 20, 2012 entitled State M-1 AP-072, Stage 1 Abatement Report (Site Assessment Investigation). Analytical results for soil and groundwater sampling are summarized on Figure 1.

3. STAGE 2 ABATEMENT PLAN PROPOSAL

After review of various remedial options, we propose the following Stage 2 Abatement Plan. The plan addresses soil and groundwater remediation.

3.1 Soil Remediation

The selected remedial option will be the excavation of near-surface soils and installation of clay liners. The anticipated extent and depth of excavation is based on assessment activities (laboratory analysis and visual observation) and is shown in Figure 2. Near surface soils (to a depth of 5 feet below ground surface) with chloride concentrations in excess of 1,000 milligrams per kilogram (mg/kg) and a Total Petroleum Hydrocarbons (TPH) concentration in excess of 1,000 mg/kg will be excavated and disposed. Excavated soils will be disposed at Lea Land Landfill.

Areas where chloride or TPH concentrations are expected to exceed 1,000 mg/kg at depths greater than 5 feet below ground surface soils will be excavated to a depth of 5

feet below ground surface. Soils will be screened in the field for chlorides using chloride field test kits and for TPH using a photoionization. Critical samples (samples used to delineate the excavations) will be submitted for laboratory analysis of chlorides and/or TPH. Following excavation, a 12-inch compacted clay layer that meets or exceeds a permeability of equal to or less than 1×10^{-8} centimeters per second will be installed in the excavations. The lined excavations will be backfilled with four feet of locally obtained native soil. All of the excavated areas will be re-seeded with native vegetation. Areas that are supporting vegetation will not be disturbed.

Use of the USEPA Multi-Med model demonstrates that the clay liners will mitigate the leaching of chlorides to groundwater. The model predicts that after 7000 years of infiltration through the liner the maximum concentration of chlorides in groundwater will be 221.8 milligrams per liter (mg/L). The Multi-Med inputs and outputs are included in Appendix A.

3.2 Groundwater Remediation and Monitoring

One additional groundwater monitoring well will be installed downgradient of the site. The monitoring well will be designated MW-8.

Groundwater samples will be collected from all of the monitoring wells and analyzed for chlorides using USEPA method 9056 for each of four quarters. Based on sample results for one year (four quarters), sampling frequency will be reviewed and may be revised.

Sampling will be discontinued when eight quarters of sample results indicate chloride concentrations are below New Mexico Water Quality Control Commission, Title 20, Chapter 6, Part 2 standards. Sample results will be submitted to the NMOCD annually on June 15.

Following removal of LNAPL from MW-1, groundwater samples will be collected from MW-1 and analyzed for benzene, toluene ethylbenzene and xylenes (BTEX) using USEPA method 8260B for each of four quarters. Based on sample results for one year (four quarters), sampling frequency will be reviewed and may be revised.

Sampling of MW-1 for BTEX will be discontinued when eight quarters of sample results indicate BTEX concentrations are below New Mexico Water Quality Control Commission, Title 20, Chapter 6, Part 2 standards. Sample results will be submitted to

the NMOCD annually on June 15. Proposed groundwater remediation is presented in Sections 3.2.1 and 3.2.2.

3.2.1 Chlorides

Chloride concentrations in groundwater exceed New Mexico Water Quality Control Commission standards in two wells (MW-1 411mg/L and MW-4 472mg/L).

Removal of near-surface soils that are a potential source of chlorides and BTEX in groundwater and lining of excavations with chloride and TPH concentrations in excess of 1,000 mg/kg will mitigate leaching of chlorides to groundwater. Considering the relatively low concentrations of chlorides in groundwater and the fact that soil removal and clay liner infiltration barrier installation will be conducted at this site, we propose monitoring the site for a period of two years before considering pumping of groundwater at this site. With the proposed source removal and mitigation and the severe drought conditions being experienced in this area, we believe it prudent to evaluate if chloride mass removal by pumping is warranted at this site.

3.2.2 Hydrocarbons

A pilot LNAPL recovery test will take place over a three week period and will be used to develop long-term recovery procedures. LNAPL will be recovered from MW-1 and disposed in a NMOCD approved facility. Additionally, two soil vent borings equipped with wind turbines will be installed in the area near MW-1.

4. PUBLIC NOTIFICATION

Written notification of submittal of the Stage 2 Abatement Plan Proposal and site activities will be sent to all surface owners of record within a one-mile radius of the site. NMOCD will be supplied with a list of parties to be notified. Publication of notice of activities will be published in a state-wide circulated newspaper, the Albuquerque Journal, and two county newspapers, the Hobbs-Daily News Sun and the Lovington Leader.

5. REMEDIATION WORK SCHEDULE

Soil remediation activities are expected to be completed in 15 working days (Monday through Friday). Groundwater remediation activities will be ongoing. An estimated completion date for groundwater remediation is not available.

6. REFERENCES

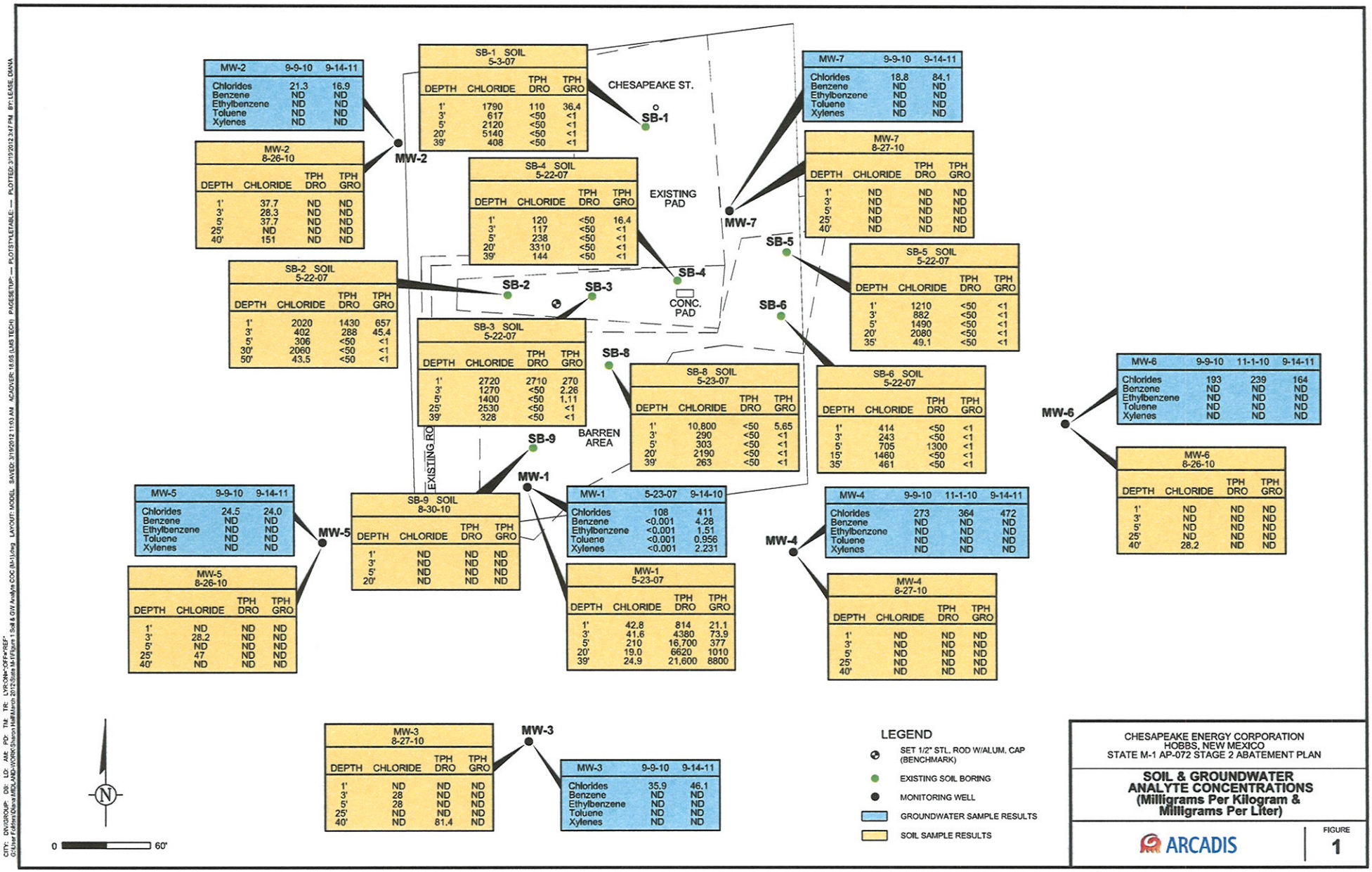
Groundwater Handbook; United States Environmental Protection Agency, Office of Research and Development, Center for Environmental Research Information; 1992

New Mexico Water Quality Control Commission, Title 20 Chapter 6, Part 2, Subpart I

State M-1 AP-072 Stage 1 Abatement Report (Site Assessment Investigation); ARCADIS; March 2012

State M-1Salt Water Disposal Tank Battery, Stage 1 Abatement Plan (Ap-072), BBC International; August 2007

New Mexico Water Quality Control Commission, Title 20 Chapter 6, Part 2, Subpart I

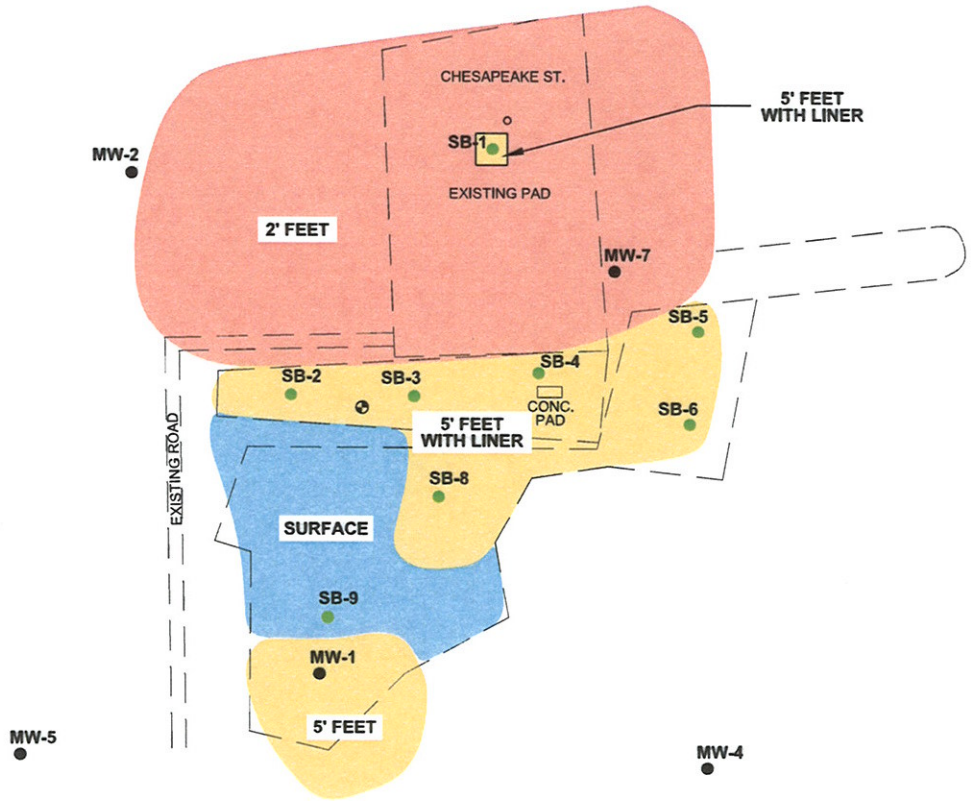


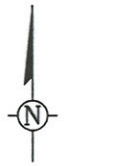
CHESAPEAKE ENERGY CORPORATION
HOBBS, NEW MEXICO
STATE M-1 AP-072 STAGE 2 ABATEMENT PLAN

SOIL & GROUNDWATER ANALYTE CONCENTRATIONS (Milligrams Per Kilogram & Milligrams Per Liter)

ARCADIS

FIGURE 1





LEGEND

- SET 1/2" STL. ROD W/ALUM. CAP (BENCHMARK)
- EXISTING SOIL BORING
- MONITORING WELL
- SURFACE
- 2' FEET
- 5' FEET

CHESAPEAKE ENERGY CORPORATION
HOBBS, NEW MEXICO
STATE M-1 AP-072 STAGE 2 ABATEMENT PLAN

PROPOSED EXCAVATION MAP

ARCADIS

FIGURE 2

ARCADIS

Appendix A

Multi-Med Model Inputs and Outputs

Chesapeake State M-1
Chesapeake Energy Corporation
Buckeye, Lea County, New Mexico
Multimed Model Input and Output (With Liner)

MODEL INPUT AND OUTPUT						MODEL RANGE	
INPUT PARAMETERS						Minimum	Maximum
Unsaturated Zone Flow Parameters							
Depth of Unsaturated Zone	m	45	feet	13.7	m	0.000000001	None
Hydraulic Conductivity	cm/hr	2	ft/day	2.54	cm/hr	0.00000000001	10,000
Unsaturated Zone Porosity	fraction	0.05	fraction	0.05	fraction	0.000000001	0.99
Residual Water Content	fraction	0.01	fraction	0.010	fraction	0.000000001	1
Unsaturated Zone Transport Parameters							
Thickness of Layer	m	45	feet	13.7	m	0.000000001	None
Percent of Organic Matter	%	2.6	%	2.6	%	0	100
Bulk Density	g/cm^3	1.35	g/cm^3	1.35	g/cm^3	0.01	5
Biological Decay Coefficient	1/yr	0	1/yr	0	1/yr	0	None
Aquifer Parameters							
Aquifer Porosity	fraction	0.25	fraction	0.25	fraction	0.000000001	0.99
Bulk Density	g/cm^3	1.35	g/cm^3	1.35	g/cm^3	0.01	5
Aquifer Thickness	m	50	ft	15.24	m	0.000000001	100,000
Hydraulic Conductivity	m/yr	2	ft/day	223	m/yr	0.0000001	100,000,000
Hydraulic Gradient	m/m	0.007	m/m	0.007	m/m	0.00000001	None
Organic Carbon Content	fraction	0.00315	fraction	0.00315	fraction	0.000001	1
Temperature of Aquifer	°C	14.4	°C	14.4	°C	0.00000001	None
pH		6.2		6.2		0.3	14
x-distance Radial Distance from Site to Receptor	m	1	m	1	m	1	None
Source Parameters							
Infiltration Rate from the Facility	m/yr	0.124	in/yr	0.00315	m/yr	0.0000000001	10,000,000,000
Area of Waste Disposal Unit	m^2	46,800	ft^2	4348	m^2	0.01	None
Length Scale of Facility	m	240	feet	73.2	m	0.000000001	10,000,000,000
Width Scale of Facility	m	195	feet	59.4	m	0.000000001	10,000,000,000
Recharge Rate into the Plume	m/yr	16.71	in/yr	0.4244	m/yr	0	10,000,000,000
Duration of Pulse	yr	8,000	yr	8000	yr	0.000000001	None
Initial Concentration at Landfill	mg/L	6,000	mg/L	6,000	mg/L	0	None
Additional Parameters							
Method				Gaussian		Gaussian	Patch
Name of Chemical Specified				Chloride			

MODEL OUTPUT			
Final Concentration at Landfill	mg/L	221.8	mg/L

MODEL OUTPUT				
Concentration at Landfill	0.0 mg/L	Time	1	yr
	0.0 mg/L		10	yr
	0.0 mg/L		20	yr
	18.9 mg/L		50	yr
	36.6 mg/L		70	yr
	45.4 mg/L		80	yr
	61.8 mg/L		100	yr
	123.4 mg/L		200	yr
	154.1 mg/L		300	yr
	166.3 mg/L		400	yr
	178.5 mg/L		500	yr
	190.7 mg/L		600	yr
	204.8 mg/L		800	yr
	211.1 mg/L		1,000	yr
	220.4 mg/L		2,000	yr
	221.6 mg/L		3,000	yr
	221.8 mg/L		4,000	yr
	221.8 mg/L		5,000	yr
	221.8 mg/L		6,000	yr
	221.8 mg/L		7,000	yr

Chesapeake State M-1
Chesapeake Energy Corporation
Buckeye, Lea County, New Mexico

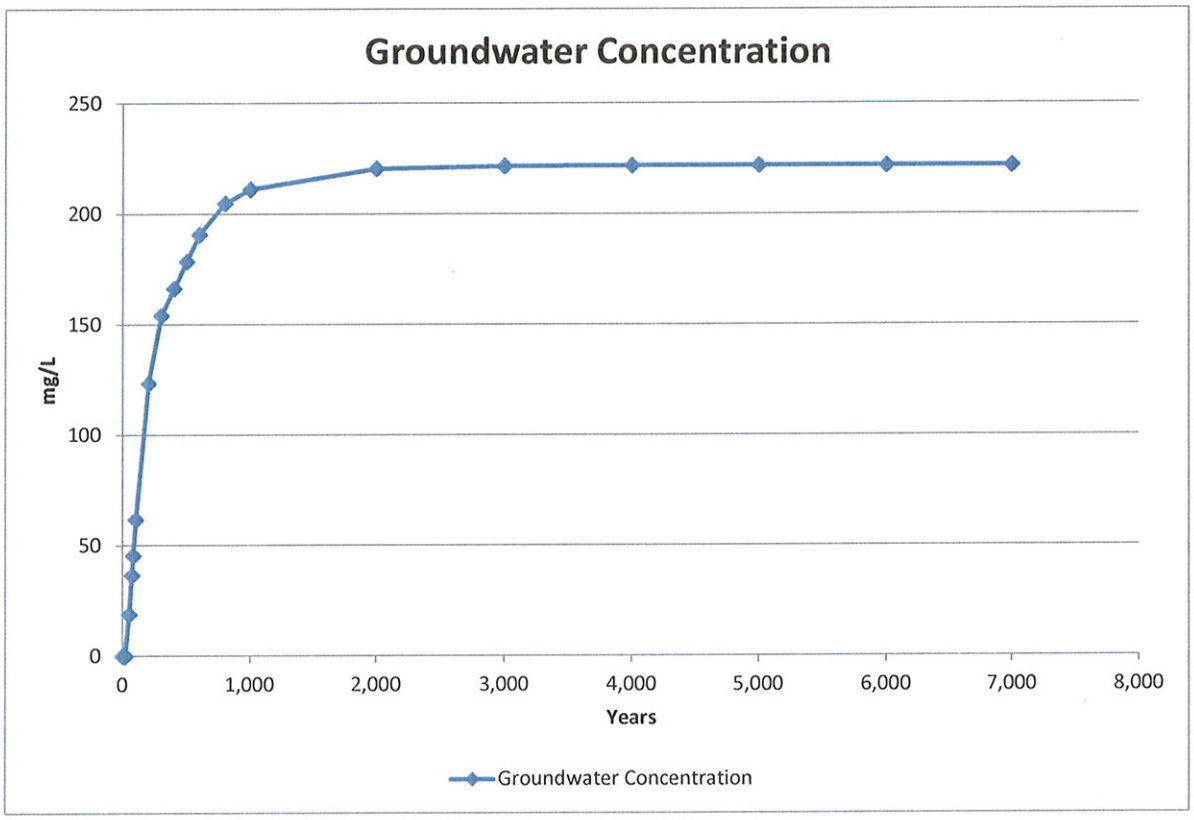


TABLE 6-3. TOTAL POROSITY OF VARIOUS MATERIALS

Material	No. of Analyses	Range	Arithmetic Mean
Igneous Rocks			
Weathered granite	8	0.34-0.57	0.45
Weathered gabbro	4	0.42-0.45	0.43
Basalt	94	0.03-0.35	0.17
Sedimentary Materials			
Sandstone	65	0.14-0.49	0.34
Siltstone	7	0.21-0.41	0.35
Sand (fine)	243	0.26-0.53	0.43
Sand (coarse)	26	0.31-0.46	0.39
Gravel (fine)	38	0.25-0.38	0.34
Gravel (coarse)	15	0.24-0.36	0.28
Silt	281	0.34-0.61	0.46
Clay	74	0.34-0.57	0.42
Limestone	74	0.07-0.56	0.3
Metamorphic Rocks			
Schist	18	0.04-0.49	0.38

Sources: From Mercer et al. (1982),
McWhorter and Sunada (1977),
Original reference Morris and Johnson, (1967).

Texture	Bulk Density g/cm^3	Average Wilting Point	Plant Available Water Inches/Ft
Sandy loam	1.6	0.057	1.66
Silt Loam	1.45	0.119	2
Loam	1.5	0.097	2.4
Sandy clay loam	1.45	0.137	1.66
Clay loam	1.45	0.157	1.9

TABLE 6-8. MEAN BULK DENSITY (g/cm3) FOR FIVE SOIL TEXTURAL CLASSIFICATIONSa,b

Soil Texture	Mean Value	Range Reported
Silt Loams	1.32	0.86 - 1.67
Clay and Clay Loams	1.3	0.94 - 1.54
Sandy Loams	1.49	1.25 - 1.76
Gravelly Silt Loams	1.22	1.02 - 1.58
Loams	1.42	1.16 - 1.58
All Soils	1.35	0.86 - 1.76

a Baes, C.F., III and R.D. Sharp. 1983. A Proposal for Estimation of Soil Leaching Constants for Use in Assessment Models. J. Environ. Qual. 12(1):17-28 (Original reference).

b From Dean et al. (1989)

TABLE 6-2. DESCRIPTIVE STATISTICS FOR SATURATED HYDRAULIC CONDUCTIVITY (cm hr-1)

Soil Type	Hydraulic Conductivity (Ks)* x	s	CV	n		
Clay**	0.2	0.42	210.3	114	cm/hr	17.52
Clay Loam	0.26	0.7	267.2	345	cm/hr	22.776
Loam	1.04	1.82	174.6	735	cm/hr	91.104
Loamy Sand	14.59	11.36	77.9	315	cm/hr	1278.084
Silt	0.25	0.33	129.9	88	cm/hr	21.9
Silt Loam	0.45	1.23	275.1	1093	cm/hr	39.42
Silty Clay	0.02	0.11	453.3	126	cm/hr	1.752
Silty Clay Loam	0.07	0.19	288.7	592	cm/hr	6.132
Sand	29.7	15.6	52.4	246	cm/hr	2601.72
Sandy Clay	0.12	0.28	234.1	46	cm/hr	10.512
Sandy Clay Loam	1.31	2.74	208.6	214	cm/hr	114.756
Sandy Loam	4.42	5.63	127	1183	cm/hr	387.192

* n = Sample size, = Mean, s = Standard deviation, CV = Coefficient of variation (percent)

** Agricultural soil, less than 60 percent clay

Sources: From Dean et al. (1989),
Original reference Carsel and Parrish (1988).

Saturated water content is the maximum volumetric amount of water in the soil when all pores are filled with water. Very often it is assumed that saturated water content equals the porosity n . However, in many cases qS is smaller than n due to the fact that small amounts of air will be trapped in very small pores. Residual water content can be defined as the asymptote of the pF-curve when h gets very high negative values. Usually qR is very small - on the order of 0.001--0.02 for coarse soils but gets as high values as 0.15..0.25 for heavy clay soils. Air entry point ha is

Soil texture. Fine-textured soils can hold much more organic matter than sandy soils for two reasons. First, clay particles form electrochemical bonds that hold organic compounds. Second, decomposition occurs faster in well-aerated sandy soils. A sandy loam rarely holds more than 2% organic matter.

The recharge rate in this model is the net amount of water that percolates directly into the aquifer system outside of the land disposal facility. The recharge is assumed to have no contamination and hence dilutes the groundwater contaminant plume. The recharge rate into the plume can be calculated in a variety of ways. One possibility is to use a model, such as HELP (Hydrologic Evaluation of Landfill Performance) (Schroeder et al., 1984), without any engineering controls (leachate collection system or a liner) to simulate the water balance for natural conditions.

The infiltration rate is the net amount of leachate that percolates into the aquifer system from a land disposal facility. Because of the use of engineering controls and the presence of non-native porous materials in the landfill facility, the infiltration rate will typically be different than the recharge rate. However, it can be estimated by similar

Most soils contain 2-10 percent organic matter. *The Importance of Soil Organic Matter: Key to Drought-Resistant Soil and Sustained Food Production. http://www.fao.org*

APPENDIX B

NMOCD APPROVAL OF STAGE 2 ABATEMENT PLAN

From:	Chase Acker
To:	Bruce McKenzie
Subject:	FW: Stage 2 Abatement Plan Approval: AP-72 Former State M-1 Tank Battery located in Unit Letter O of Section 18 in Township 17 South, Range 36 East, NMPM in Lea County, NM
Date:	Monday, April 14, 2014 1:56:01 PM

From: Griswold, Jim, EMNRD [mailto:Jim.Griswold@state.nm.us]
Sent: Thursday, June 27, 2013 5:14 PM
To: Larry Wooten
Cc: Hall, Sharon; Chase Acker
Subject: Stage 2 Abatement Plan Approval: AP-72 Former State M-1 Tank Battery located in Unit Letter O of Section 18 in Township 17 South, Range 36 East, NMPM in Lea County, NM

Mr. Wooten,

The Oil Conservation Division (OCD) has reviewed the Stage 2 Abatement Plan for the above-referenced site submitted on your behalf by Arcadis and dated 3/27/12. That plan has substantially met the requirements of 19.15.30 NMAC and is hereby approved. Please proceed with field activities.

Be advised this approval does not relieve Chesapeake of responsibility should the situation continue to pose a threat to groundwater, surface water, human health, or the environment. Furthermore, this approval does not relieve your responsibility for compliance with any federal, state, or local laws and/or regulations. Please retain a copy of this email for your files, as no hardcopy will be sent. If you have any questions, please feel free to contact me at any time.

Jim Griswold
Senior Hydrologist
EMNRD/Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505.476.3465
email: jim.griswold@state.nm.us

APPENDIX C

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-130218-1
TestAmerica Sample Delivery Group: Property ID 891077
Client Project/Site: CHK STATE M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

Authorized for release by:
6/21/2017 3:12:16 PM
Shali Brown, Project Manager II
(615)301-5031
shali.brown@testamericainc.com

Designee for

Cathy Gartner, Project Manager I
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-130218-1	MW-1R	Water	06/07/17 13:19	06/08/17 09:45
490-130218-2	MW-2	Water	06/06/17 08:54	06/08/17 09:45
490-130218-3	MW-3	Water	06/06/17 11:55	06/08/17 09:45
490-130218-4	MW-4	Water	06/06/17 13:52	06/08/17 09:45
490-130218-5	MW-5	Water	06/06/17 10:15	06/08/17 09:45
490-130218-6	MW-6	Water	06/06/17 17:45	06/08/17 09:45
490-130218-7	MW-7	Water	06/07/17 09:29	06/08/17 09:45
490-130218-8	MW-8	Water	06/06/17 15:43	06/08/17 09:45
490-130218-9	EQ Blank	Water	06/06/17 11:10	06/08/17 09:45
490-130218-10	Duplicate 1	Water	06/06/17 00:01	06/08/17 09:45

Job ID: 490-130218-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-130218-1

Comments
No additional comments.

Receipt
The samples were received on 6/8/2017 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2º C.

HPLC/IC
Method(s) 300.0: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 490-438425 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 300.0: The following samples was diluted due to the nature of the sample matrix: MW-2 (490-130218-2), MW-3 (490-130218-3), MW-4 (490-130218-4), MW-5 (490-130218-5), MW-6 (490-130218-6), MW-8 (490-130218-8) and Duplicate 1 (490-130218-10). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: The following samples was diluted due to the nature of the sample matrix: MW-1R (490-130218-1) and MW-7 (490-130218-7). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-1R
Date Collected: 06/07/17 13:19
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28.6		5.00		mg/L			06/16/17 17:30	5

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-2
Date Collected: 06/06/17 08:54
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.9		5.00		mg/L			06/16/17 13:11	5

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-3
Date Collected: 06/06/17 11:55
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	53.7		10.0		mg/L			06/16/17 13:25	10

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-4
Date Collected: 06/06/17 13:52
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	493		50.0		mg/L			06/16/17 13:38	50

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-5
Date Collected: 06/06/17 10:15
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.7		5.00		mg/L			06/16/17 13:52	5

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-6
Date Collected: 06/06/17 17:45
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	86.3		10.0		mg/L			06/16/17 14:06	10

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-7
Date Collected: 06/07/17 09:29
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23.8		5.00		mg/L			06/16/17 17:43	5

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-8
Date Collected: 06/06/17 15:43
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	531		50.0		mg/L			06/16/17 14:19	50

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: EQ Blank

Date Collected: 06/06/17 11:10
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-9

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.57	F1	1.00		mg/L			06/16/17 14:33	1

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: Duplicate 1
Date Collected: 06/06/17 00:01
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-10
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	492		50.0		mg/L			06/16/17 15:14	50

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-438421/3
Matrix: Water
Analysis Batch: 438421

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/16/17 16:49	1

Lab Sample ID: LCS 490-438421/4
Matrix: Water
Analysis Batch: 438421

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.889		mg/L		99	90 - 110

Lab Sample ID: LCSD 490-438421/5
Matrix: Water
Analysis Batch: 438421

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	10.06		mg/L		101	90 - 110	2	20

Lab Sample ID: 490-130284-D-7 MS
Matrix: Water
Analysis Batch: 438421

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	ND		2.00	1.969		mg/L		98	80 - 120

Lab Sample ID: 490-130284-D-7 MSD
Matrix: Water
Analysis Batch: 438421

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	ND		2.00	1.972		mg/L		99	80 - 120	0	20

Lab Sample ID: MB 490-438425/3
Matrix: Water
Analysis Batch: 438425

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/16/17 12:30	1

Lab Sample ID: LCS 490-438425/4
Matrix: Water
Analysis Batch: 438425

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.06		mg/L		101	90 - 110

Lab Sample ID: LCSD 490-438425/5
Matrix: Water
Analysis Batch: 438425

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	10.14		mg/L		101	90 - 110	1	20

QC Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Lab Sample ID: 490-130218-9 MS
Matrix: Water
Analysis Batch: 438425

Client Sample ID: EQ Blank
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	3.57	F1	2.00	4.785	F1	mg/L		61	80 - 120		

Lab Sample ID: 490-130218-9 MSD
Matrix: Water
Analysis Batch: 438425

Client Sample ID: EQ Blank
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	3.57	F1	2.00	4.764	F1	mg/L		59	80 - 120	0	20

HPLC/IC

Analysis Batch: 438421

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-130218-1	MW-1R	Total/NA	Water	300.0	
490-130218-7	MW-7	Total/NA	Water	300.0	
MB 490-438421/3	Method Blank	Total/NA	Water	300.0	
LCS 490-438421/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-438421/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-130284-D-7 MS	Matrix Spike	Total/NA	Water	300.0	
490-130284-D-7 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Analysis Batch: 438425

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-130218-2	MW-2	Total/NA	Water	300.0	
490-130218-3	MW-3	Total/NA	Water	300.0	
490-130218-4	MW-4	Total/NA	Water	300.0	
490-130218-5	MW-5	Total/NA	Water	300.0	
490-130218-6	MW-6	Total/NA	Water	300.0	
490-130218-8	MW-8	Total/NA	Water	300.0	
490-130218-9	EQ Blank	Total/NA	Water	300.0	
490-130218-10	Duplicate 1	Total/NA	Water	300.0	
MB 490-438425/3	Method Blank	Total/NA	Water	300.0	
LCS 490-438425/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-438425/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-130218-9 MS	EQ Blank	Total/NA	Water	300.0	
490-130218-9 MSD	EQ Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-1R
Date Collected: 06/07/17 13:19
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			438421	06/16/17 17:30	T1C	TAL NSH

Client Sample ID: MW-2
Date Collected: 06/06/17 08:54
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			438425	06/16/17 13:11	T1C	TAL NSH

Client Sample ID: MW-3
Date Collected: 06/06/17 11:55
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			438425	06/16/17 13:25	T1C	TAL NSH

Client Sample ID: MW-4
Date Collected: 06/06/17 13:52
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			438425	06/16/17 13:38	T1C	TAL NSH

Client Sample ID: MW-5
Date Collected: 06/06/17 10:15
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			438425	06/16/17 13:52	T1C	TAL NSH

Client Sample ID: MW-6
Date Collected: 06/06/17 17:45
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			438425	06/16/17 14:06	T1C	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Client Sample ID: MW-7

Date Collected: 06/07/17 09:29
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			438421	06/16/17 17:43	T1C	TAL NSH

Client Sample ID: MW-8

Date Collected: 06/06/17 15:43
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			438425	06/16/17 14:19	T1C	TAL NSH

Client Sample ID: EQ Blank

Date Collected: 06/06/17 11:10
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			438425	06/16/17 14:33	T1C	TAL NSH

Client Sample ID: Duplicate 1

Date Collected: 06/06/17 00:01
Date Received: 06/08/17 09:45

Lab Sample ID: 490-130218-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			438425	06/16/17 15:14	T1C	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-130218-1
SDG: Property ID 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-17

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-130218 Chain of Custody

Cooler Received/Opened On 06-08-2017 @ 09:45

Time Samples Removed From Cooler 1736 Time Samples Placed In Storage 1750 (2 Hour Window)

1. Tracking # 7593 (last 4 digits, FedEx) Courier: _FedEx_

IR Gun ID 17960358 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 0.2 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 (Front)

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) J.J.

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (initial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) _____

I certify that I attached a label with the unique LIMS number to each container (initial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 12/15/15

CHAIN OF CUSTODY RECORD

No. 02784

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM101	PROJECT NAME: CHK STATE M-1
SHIPPED TO: TA-NASH	PROJECT MANAGER: BRUCE McKENZIE
COC 1 of 1	TAT: STANDARD

SAMPLER'S PRINTED NAME: Justin Hoppis
SAMPLER'S SIGNATURE: Justin Hoppis

ASOW: N/A

GenSnb: 750-521
PropID: 891077

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE	REMARKS
6-7-17	1319	MW-1R	W	1	X	Note:* freephase in well.
6-6-17	0854	MW-2	W	1	X	
6-6-17	1155	MW-3	W	1	X	
6-6-17	1352	MW-4	W	1	X	
6-6-17	1015	MW-5	W	1	X	
6-6-17	1745	MW-6	W	1	X	
6-7-17	0929	MW-7	W	1	X	
6-6-17	1543	MW-8	W	1	X	
6-6-17	1110	EQ Blank	W	1	X	
6-6-17	0000	Duplicate 1	W	1	X	

Loc: 490
130218

JH

TOTAL NUMBER OF CONTAINERS → 10

RELINQUISHED BY: Justin Hoppis	DATE 6-7-17 TIME 1800	RECEIVED BY:	DATE 6-8-17 TIME 0945
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME
METHOD OF SHIPMENT: FED EX		AIRBILL NUMBER: 7370 7423 7593	0.2
RECEIVED IN LABORATORY BY:	DATE TIME	Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at jczech@envirocleanps.com	
LABORATORY CONTACT: Cathy Gartner		LABORATORY ADDRESS: 2960 Foster Creighton Drive Nashville, TN 37204	

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

6/21/2017

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 490-130218-1
SDG Number: Property ID 891077

Login Number: 130218
List Number: 1
Creator: West, Derrick D

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-136393-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Bruce McKenzie

CathyGartner

Authorized for release by:
9/28/2017 10:23:25 AM

Cathy Gartner, Project Manager I
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-136393-1	MW-1R	Water	09/08/17 08:37	09/12/17 08:55
490-136393-2	MW-2	Water	09/08/17 08:30	09/12/17 08:55
490-136393-3	MW-3	Water	09/08/17 10:25	09/12/17 08:55
490-136393-4	MW-4	Water	09/08/17 11:50	09/12/17 08:55
490-136393-5	MW-5	Water	09/08/17 09:27	09/12/17 08:55
490-136393-6	MW-6	Water	09/08/17 14:35	09/12/17 08:55
490-136393-7	MW-7	Water	09/08/17 15:40	09/12/17 08:55
490-136393-8	MW-8	Water	09/08/17 13:20	09/12/17 08:55
490-136393-9	EQ Blank	Water	09/08/17 09:46	09/12/17 08:55
490-136393-10	Dup	Water	09/08/17 00:01	09/12/17 08:55

Job ID: 490-136393-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-136393-1

Comments
No additional comments.

Receipt
The samples were received on 9/12/2017 8:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.5º C.

HPLC/IC
Method(s) 300.0: The following samples was diluted due to the nature of the sample matrix: MW-2 (490-136393-2), MW-3 (490-136393-3), MW-4 (490-136393-4), MW-5 (490-136393-5), MW-6 (490-136393-6), MW-7 (490-136393-7), MW-8 (490-136393-8) and Dup (490-136393-10). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-1R
Date Collected: 09/08/17 08:37
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.3		10.0		mg/L			09/21/17 12:21	10

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-2
Date Collected: 09/08/17 08:30
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.2	F1	1.00		mg/L			09/21/17 12:39	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-3
Date Collected: 09/08/17 10:25
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	49.5		10.0		mg/L			09/21/17 14:09	10

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 09/08/17 11:50
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	465		50.0		mg/L			09/21/17 14:45	50

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-5
Date Collected: 09/08/17 09:27
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	20.4		10.0		mg/L			09/21/17 15:21	10

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-6
Date Collected: 09/08/17 14:35
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	79.3		10.0		mg/L			09/21/17 16:34	10

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-7
Date Collected: 09/08/17 15:40
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.0		2.00		mg/L			09/27/17 11:02	2

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 09/08/17 13:20
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	573		50.0		mg/L			09/21/17 17:46	50

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 09/08/17 09:46
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			09/21/17 18:04	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: Dup
Date Collected: 09/08/17 00:01
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-10
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	506		50.0		mg/L			09/21/17 18:40	50

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-461778/3
Matrix: Water
Analysis Batch: 461778

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			09/21/17 11:08	1

Lab Sample ID: LCS 490-461778/4
Matrix: Water
Analysis Batch: 461778

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.374		mg/L		94	90 - 110

Lab Sample ID: LCSD 490-461778/5
Matrix: Water
Analysis Batch: 461778

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.120		mg/L		91	90 - 110	3	20

Lab Sample ID: MB 490-463432/3
Matrix: Water
Analysis Batch: 463432

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			09/27/17 08:55	1

Lab Sample ID: LCS 490-463432/4
Matrix: Water
Analysis Batch: 463432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.203		mg/L		92	90 - 110

Lab Sample ID: LCSD 490-463432/5
Matrix: Water
Analysis Batch: 463432

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.347		mg/L		93	90 - 110	2	20

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

HPLC/IC

Analysis Batch: 461778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-136393-1	MW-1R	Total/NA	Water	300.0	
490-136393-2	MW-2	Total/NA	Water	300.0	
490-136393-3	MW-3	Total/NA	Water	300.0	
490-136393-4	MW-4	Total/NA	Water	300.0	
490-136393-5	MW-5	Total/NA	Water	300.0	
490-136393-6	MW-6	Total/NA	Water	300.0	
490-136393-8	MW-8	Total/NA	Water	300.0	
490-136393-9	EQ Blank	Total/NA	Water	300.0	
490-136393-10	Dup	Total/NA	Water	300.0	
MB 490-461778/3	Method Blank	Total/NA	Water	300.0	
LCS 490-461778/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-461778/5	Lab Control Sample Dup	Total/NA	Water	300.0	

Analysis Batch: 463432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-136393-7	MW-7	Total/NA	Water	300.0	
MB 490-463432/3	Method Blank	Total/NA	Water	300.0	
LCS 490-463432/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-463432/5	Lab Control Sample Dup	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-1R
Date Collected: 09/08/17 08:37
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			461778	09/21/17 12:21	JHS	TAL NSH

Client Sample ID: MW-2
Date Collected: 09/08/17 08:30
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			461778	09/21/17 12:39	JHS	TAL NSH

Client Sample ID: MW-3
Date Collected: 09/08/17 10:25
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			461778	09/21/17 14:09	JHS	TAL NSH

Client Sample ID: MW-4
Date Collected: 09/08/17 11:50
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			461778	09/21/17 14:45	JHS	TAL NSH

Client Sample ID: MW-5
Date Collected: 09/08/17 09:27
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			461778	09/21/17 15:21	JHS	TAL NSH

Client Sample ID: MW-6
Date Collected: 09/08/17 14:35
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			461778	09/21/17 16:34	JHS	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Client Sample ID: MW-7
Date Collected: 09/08/17 15:40
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2			463432	09/27/17 11:02	JHS	TAL NSH

Client Sample ID: MW-8
Date Collected: 09/08/17 13:20
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			461778	09/21/17 17:46	JHS	TAL NSH

Client Sample ID: EQ Blank
Date Collected: 09/08/17 09:46
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			461778	09/21/17 18:04	JHS	TAL NSH

Client Sample ID: Dup
Date Collected: 09/08/17 00:01
Date Received: 09/12/17 08:55

Lab Sample ID: 490-136393-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			461778	09/21/17 18:40	JHS	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: State M-1

TestAmerica Job ID: 490-136393-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-18

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-136393 Chain of Custody

Cooler Received/Opened On 9/12/2017 @ 0855

Time Samples Removed From Cooler 13:48 Time Samples Placed In Storage 14:15 (2 Hour Window)

1. Tracking # 8120 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID Raynger pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 1.5 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES NO NA

If yes, how many and where: 1Front 1Back

5. Were the seals intact, signed, and dated correctly? YES NO NA

6. Were custody papers inside cooler? YES NO NA

I certify that I opened the cooler and answered questions 1-6 (intial) AJH

7. Were custody seals on containers: YES NO and Intact YES NO NA

Were these signed and dated correctly? YES NO NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES NO NA

12. Did all container labels and tags agree with custody papers? YES NO NA

13a. Were VOA vials received? YES NO NA

b. Was there any observable headspace present in any VOA vial? YES NO NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES NO NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) JJ

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO NA

b. Did the bottle labels indicate that the correct preservatives were used YES NO NA

16. Was residual chlorine present? YES NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KD

17. Were custody papers properly filled out (ink, signed, etc)? YES NO NA

18. Did you sign the custody papers in the appropriate place? YES NO NA

19. Were correct containers used for the analysis requested? YES NO NA

20. Was sufficient amount of sample sent in each container? YES NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KD

I certify that I attached a label with the unique LIMS number to each container (intial) KD

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO #_____

BIS = Broken in shipment
Cooler Receipt Form.doc

CHAIN OF CUSTODY RECORD

No. 03099

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM101	PROJECT NAME: CHK STATE M1	COC 1 of 1	
SHIPPED TO: TA-NASH	PROJECT MANAGER: BRUCE MCKENZIE	TAT: STANDARD	

SAMPLER'S PRINTED NAME: TERRY FISHER
SAMPLER'S SIGNATURE:

ASOW: N/A

Gen sub: 750-521
Prop ID: 891077

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE	REMARKS
9-8-17	0837	MW-1R	W	1	X	* free phase in well MW-R1
9-8-17	0830	MW-2	W	1	X	
9-8-17	1025	MW-3	W	1	X	
9-8-17	1150	MW-4	W	1	X	
9-8-17	0927	MW-5	W	1	X	
9-8-17	1435	MW-6	W	1	X	
9-8-17	1540	MW-7	W	1	X	1.5
9-8-17	1320	MW-8	W	1	X	
9-8-17	0946	EQ Blank	W	1	X	
9-8-17	—	Dup	W	1	X	

Loc: 490
136393

TOTAL NUMBER OF CONTAINERS → 10

RELINQUISHED BY:	DATE 9-11-17	RECEIVED BY: TAN	DATE 09-12-2017
	TIME 0530		TIME 08:55
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME		TIME

METHOD OF SHIPMENT: FEDEX

AIRBILL NUMBER: 7122 0851 8120

RECEIVED IN LABORATORY BY: DATE / TIME

Send PDF, EDD, and INVOICE (if applicable) to:
JULIE CZECH at jczech@envirocleanps.com

LABORATORY CONTACT: CATHY GARTNER

LABORATORY ADDRESS: 2960 Foster Creighton Drive Nashville, TN 37204

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☑ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

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9/28/2017

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 490-136393-1
SDG Number: Property ID: 891077

Login Number: 136393
List Number: 1
Creator: Dawson, Keith M

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-142487-1
TestAmerica Sample Delivery Group: Property ID 891077
Client Project/Site: Chk State M-1
Sampling Event: CHK State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

Cathy Gartner

Authorized for release by:
12/14/2017 9:48:15 AM

Cathy Gartner, Project Manager I
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-142487-1	EQ Blank	Water	12/04/17 07:30	12/07/17 09:50
490-142487-2	MW-2	Water	12/04/17 08:35	12/07/17 09:50
490-142487-3	MW-5	Water	12/04/17 09:50	12/07/17 09:50
490-142487-4	MW-3	Water	12/04/17 11:00	12/07/17 09:50
490-142487-5	MW-4	Water	12/04/17 12:25	12/07/17 09:50
490-142487-6	Dup	Water	12/04/17 00:01	12/07/17 09:50
490-142487-7	MW-8	Water	12/04/17 13:35	12/07/17 09:50
490-142487-8	MW-6	Water	12/06/17 09:00	12/07/17 09:50
490-142487-9	MW-7	Water	12/06/17 10:08	12/07/17 09:50
490-142487-10	MW-R1	Water	12/06/17 13:00	12/07/17 09:50

Job ID: 490-142487-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-142487-1

Comments
No additional comments.

Receipt
The samples were received on 12/7/2017 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.1° C.

HPLC/IC
Method(s) 300.0: The following samples was diluted due to the nature of the sample matrix: MW-3 (490-142487-4), MW-4 (490-142487-5), Dup (490-142487-6), MW-8 (490-142487-7) and MW-6 (490-142487-8). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: Due to the high concentration of Chloride, the matrix spike (MS) for analytical batch 490-482333 could not be evaluated for accuracy and precision. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: EQ Blank
Date Collected: 12/04/17 07:30
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/11/17 14:51	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-2
Date Collected: 12/04/17 08:35
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16.2		1.00		mg/L			12/11/17 15:06	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-5
Date Collected: 12/04/17 09:50
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25.4		1.00		mg/L			12/11/17 15:50	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-3
Date Collected: 12/04/17 11:00
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	58.1		5.00		mg/L			12/11/17 16:35	5

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-4
Date Collected: 12/04/17 12:25
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	492		20.0		mg/L			12/11/17 17:04	20

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: Dup
Date Collected: 12/04/17 00:01
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	489		20.0		mg/L			12/11/17 18:47	20

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-8
Date Collected: 12/04/17 13:35
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	570		20.0		mg/L			12/11/17 19:32	20

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-6
Date Collected: 12/06/17 09:00
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	71.8		5.00		mg/L			12/11/17 20:16	5

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-7
Date Collected: 12/06/17 10:08
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.7		1.00		mg/L			12/11/17 20:31	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-R1
Date Collected: 12/06/17 13:00
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-10
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.0		1.00		mg/L			12/11/17 21:00	1

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-482333/3
Matrix: Water
Analysis Batch: 482333

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/11/17 14:06	1

Lab Sample ID: LCS 490-482333/4
Matrix: Water
Analysis Batch: 482333

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.873		mg/L		99	90 - 110

Lab Sample ID: LCSD 490-482333/5
Matrix: Water
Analysis Batch: 482333

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.901		mg/L		99	90 - 110	0	20

Lab Sample ID: 490-142487-2 MS
Matrix: Water
Analysis Batch: 482333

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	16.2		10.0	27.49		mg/L		113	80 - 120

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

HPLC/IC

Analysis Batch: 482333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-142487-1	EQ Blank	Total/NA	Water	300.0	
490-142487-2	MW-2	Total/NA	Water	300.0	
490-142487-3	MW-5	Total/NA	Water	300.0	
490-142487-4	MW-3	Total/NA	Water	300.0	
490-142487-5	MW-4	Total/NA	Water	300.0	
490-142487-6	Dup	Total/NA	Water	300.0	
490-142487-7	MW-8	Total/NA	Water	300.0	
490-142487-8	MW-6	Total/NA	Water	300.0	
490-142487-9	MW-7	Total/NA	Water	300.0	
490-142487-10	MW-R1	Total/NA	Water	300.0	
MB 490-482333/3	Method Blank	Total/NA	Water	300.0	
LCS 490-482333/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-482333/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-142487-2 MS	MW-2	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: EQ Blank
Date Collected: 12/04/17 07:30
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			482333	12/11/17 14:51	SW1	TAL NSH

Client Sample ID: MW-2
Date Collected: 12/04/17 08:35
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			482333	12/11/17 15:06	SW1	TAL NSH

Client Sample ID: MW-5
Date Collected: 12/04/17 09:50
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			482333	12/11/17 15:50	SW1	TAL NSH

Client Sample ID: MW-3
Date Collected: 12/04/17 11:00
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			482333	12/11/17 16:35	SW1	TAL NSH

Client Sample ID: MW-4
Date Collected: 12/04/17 12:25
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20			482333	12/11/17 17:04	SW1	TAL NSH

Client Sample ID: Dup
Date Collected: 12/04/17 00:01
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20			482333	12/11/17 18:47	SW1	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Client Sample ID: MW-8
Date Collected: 12/04/17 13:35
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20			482333	12/11/17 19:32	SW1	TAL NSH

Client Sample ID: MW-6
Date Collected: 12/06/17 09:00
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			482333	12/11/17 20:16	SW1	TAL NSH

Client Sample ID: MW-7
Date Collected: 12/06/17 10:08
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			482333	12/11/17 20:31	SW1	TAL NSH

Client Sample ID: MW-R1
Date Collected: 12/06/17 13:00
Date Received: 12/07/17 09:50

Lab Sample ID: 490-142487-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			482333	12/11/17 21:00	SW1	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: Chk State M-1

TestAmerica Job ID: 490-142487-1
SDG: Property ID 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-18

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-142487 Chain of Custody

Cooler Received/Opened On 12/7/17 0950

Time Samples Removed From Cooler 1930 Time Samples Placed In Storage 1943 (2 Hour Window)

1. Tracking # 9573 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 31470368 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 0.1 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) HLG

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (intial) KD

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KD

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KD

I certify that I attached a label with the unique LIMS number to each container (intial) KD

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

CHAIN OF CUSTODY RECORD

No. 03366

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM1Ø1	PROJECT NAME: CHK STATE M	COC 1 of 1	
SHIPPED TO: TA-NASH	PROJECT MANAGER: BRUCE McKENZIE	TAT: STANDARD	

SAMPLER'S PRINTED NAME: TERRY FISHER
SAMPLER'S SIGNATURE:

Loc: 490
142487

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE	Temp°	REMARKS
12/4/17	0730	EQ Blank	WATER	1	X		NOTE: MW-R1 has free Phase IN well!
12/4/17	0835	MW-2	water	1	X		
12/4/17	0950	MW-5	water	1	X		
12/4/17	1100	MW-3	water	1	X		
12/4/17	1225	MW-4	water	1	X		
12/4/17	—	Dup	water	1	X		
12/4/17	1335	MW-8	water	1	X		
12/6/17	0900	MW-6	water	1	X		
12/6/17	1008	MW-7	water	1	X		
12/6/17	1300	MW-R1	water	1	X		
—	—	Temp Blank	water	1		X	

TOTAL NUMBER OF CONTAINERS → 11

RELINQUISHED BY:	DATE 12/6/17 TIME 1600	RECEIVED BY: TAN	DATE 12-07-2017 TIME 09:50
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME

0.1

METHOD OF SHIPMENT: FED EX
AIRBILL NUMBER: 4150 9258 9573

RECEIVED IN LABORATORY BY: DATE TIME

Send PDF, EDD, and INVOICE (if applicable) to:
JULIE CZECH at julie.czech@eccgrp.com

LABORATORY CONTACT: CATHY GARTNER

LABORATORY ADDRESS: 2960 FOSTER CREIGHTON DRIVE NASHVILLE, TN 37204

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

12/14/2017

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-147771-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: CHK STATE M-1
Sampling Event: CHK State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

Cathy Gartner

Authorized for release by:
3/14/2018 2:33:06 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-147771-1	MW-1R	Water	03/07/18 10:05	03/08/18 10:05
490-147771-2	MW-2	Water	03/05/18 08:38	03/08/18 10:05
490-147771-3	MW-3	Water	03/05/18 11:08	03/08/18 10:05
490-147771-4	MW-4	Water	03/05/18 12:30	03/08/18 10:05
490-147771-5	MW-5	Water	03/05/18 10:05	03/08/18 10:05
490-147771-6	MW-6	Water	03/07/18 08:34	03/08/18 10:05
490-147771-7	MW-7	Water	03/07/18 09:58	03/08/18 10:05
490-147771-8	MW-8	Water	03/05/18 14:30	03/08/18 10:05
490-147771-9	EQ Blank	Water	03/05/18 07:40	03/08/18 10:05
490-147771-10	Dup	Water	03/05/18 01:01	03/08/18 10:05

Job ID: 490-147771-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-147771-1

Comments
No additional comments.

Receipt
The samples were received on 3/8/2018 10:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted due to the nature of the sample matrix: MW-3 (490-147771-3), MW-4 (490-147771-4), MW-6 (490-147771-6), MW-8 (490-147771-8) and Dup (490-147771-10). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: Due to the nature of the sample matrix, a matrix spike / matrix spike duplicate (MS/MSD) was not analyzed with 490-500936. However, the laboratory control sample / laboratory control sample duplicate (LCS/LCSD) recoveries were within the acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-1R
Date Collected: 03/07/18 10:05
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	33.7		1.00		mg/L			03/09/18 12:50	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-2
Date Collected: 03/05/18 08:38
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16.6		1.00		mg/L			03/09/18 13:01	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-3
Date Collected: 03/05/18 11:08
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	64.3		5.00		mg/L			03/13/18 00:33	5

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 03/05/18 12:30
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	484		20.0		mg/L			03/13/18 00:57	20

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-5
Date Collected: 03/05/18 10:05
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25.9		1.00		mg/L			03/09/18 13:36	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-6
Date Collected: 03/07/18 08:34
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	64.7		5.00		mg/L			03/13/18 01:08	5

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-7
Date Collected: 03/07/18 09:58
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	31.6		1.00		mg/L			03/09/18 13:59	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 03/05/18 14:30
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	587		20.0		mg/L			03/13/18 01:31	20

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 03/05/18 07:40
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/09/18 14:46	1

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: Dup
Date Collected: 03/05/18 01:01
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-10
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	494		50.0		mg/L			03/13/18 01:55	50

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-500428/3
Matrix: Water
Analysis Batch: 500428

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/09/18 11:40	1

Lab Sample ID: LCS 490-500428/4
Matrix: Water
Analysis Batch: 500428

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.00		mg/L		100	90 - 110

Lab Sample ID: LCSD 490-500428/5
Matrix: Water
Analysis Batch: 500428

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.948		mg/L		99	90 - 110	1	20

Lab Sample ID: 490-147642-B-1 MS
Matrix: Water
Analysis Batch: 500428

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	15.8		10.0	25.91		mg/L		101	80 - 120

Lab Sample ID: MB 490-500936/3
Matrix: Water
Analysis Batch: 500936

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/12/18 23:59	1

Lab Sample ID: LCS 490-500936/4
Matrix: Water
Analysis Batch: 500936

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.30		mg/L		103	90 - 110

Lab Sample ID: LCSD 490-500936/5
Matrix: Water
Analysis Batch: 500936

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	10.32		mg/L		103	90 - 110	0	20

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

HPLC/IC

Analysis Batch: 500428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-147771-1	MW-1R	Total/NA	Water	300.0	
490-147771-2	MW-2	Total/NA	Water	300.0	
490-147771-5	MW-5	Total/NA	Water	300.0	
490-147771-7	MW-7	Total/NA	Water	300.0	
490-147771-9	EQ Blank	Total/NA	Water	300.0	
MB 490-500428/3	Method Blank	Total/NA	Water	300.0	
LCS 490-500428/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-500428/5	Lab Control Sample Dup	Total/NA	Water	300.0	
490-147642-B-1 MS	Matrix Spike	Total/NA	Water	300.0	

Analysis Batch: 500936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-147771-3	MW-3	Total/NA	Water	300.0	
490-147771-4	MW-4	Total/NA	Water	300.0	
490-147771-6	MW-6	Total/NA	Water	300.0	
490-147771-8	MW-8	Total/NA	Water	300.0	
490-147771-10	Dup	Total/NA	Water	300.0	
MB 490-500936/3	Method Blank	Total/NA	Water	300.0	
LCS 490-500936/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-500936/5	Lab Control Sample Dup	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-1R
Date Collected: 03/07/18 10:05
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			500428	03/09/18 12:50	T1C	TAL NSH

Client Sample ID: MW-2
Date Collected: 03/05/18 08:38
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			500428	03/09/18 13:01	T1C	TAL NSH

Client Sample ID: MW-3
Date Collected: 03/05/18 11:08
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			500936	03/13/18 00:33	T1C	TAL NSH

Client Sample ID: MW-4
Date Collected: 03/05/18 12:30
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20			500936	03/13/18 00:57	T1C	TAL NSH

Client Sample ID: MW-5
Date Collected: 03/05/18 10:05
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			500428	03/09/18 13:36	T1C	TAL NSH

Client Sample ID: MW-6
Date Collected: 03/07/18 08:34
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5			500936	03/13/18 01:08	T1C	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Client Sample ID: MW-7

Date Collected: 03/07/18 09:58
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			500428	03/09/18 13:59	T1C	TAL NSH

Client Sample ID: MW-8

Date Collected: 03/05/18 14:30
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20			500936	03/13/18 01:31	T1C	TAL NSH

Client Sample ID: EQ Blank

Date Collected: 03/05/18 07:40
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			500428	03/09/18 14:46	T1C	TAL NSH

Client Sample ID: Dup

Date Collected: 03/05/18 01:01
Date Received: 03/08/18 10:05

Lab Sample ID: 490-147771-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		50			500936	03/13/18 01:55	T1C	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-147771-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oklahoma	State Program	6	9412	08-31-18

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-147771 Chain of Custody

Cooler Received/Opened On 3/8/2018 @1005

Time Samples Removed From Cooler 1622 Time Samples Placed In Storage 1632 (2 Hour Window)

1. Tracking # 2464 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 17960358 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 0.2 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO..NA

4. Were custody seals on outside of cooler? YES..NO...NA

If yes, how many and where: front

5. Were the seals intact, signed, and dated correctly? YES..NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) ES

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) ADH

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) ADH

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) ADH

I certify that I attached a label with the unique LIMS number to each container (intial) ADH

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

CHAIN OF CUSTODY RECORD

No. 03695

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM1Ø1	PROJECT NAME: CHK STATE M	COC 1 of 1	
SHIPPED TO: TA-NASH	PROJECT MANAGER: BRUCE McKENZIE	TAT: STANDARD	

SAMPLER'S PRINTED NAME: Terry Fisher
SAMPLER'S SIGNATURE:

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE	REMARKS
3-7-18	1005	mw-1R	w	1	X	
3-5-18	838	MW-2	w	1	X	
3-5-18	1108	MW-3	w	1	X	
3-5-18	1230	MW-4	w	1	X	Loc: 490 147771
3-5-18	1005	MW-5	w	1	X	
3-7-18	834	MW-6	w	1	X	
3-7-18	958	MW-7	w	1	X	
3-5-18	1430	MW-8	w	1	X	
3-5-18	740	EQ Blank	w	1	X	
3-5-18	—	Dup	w	1	X	

TOTAL NUMBER OF CONTAINERS → 10

RELINQUISHED BY: Terry Fisher	DATE 3-7-18 TIME 1500	RECEIVED BY:	DATE TIME
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	DATE TIME

METHOD OF SHIPMENT: FEDEX
AIRBILL NUMBER: 4150 9264 2464

RECEIVED IN LABORATORY BY: Adam Hawkins — DATE 3/8/18 TIME 1005

Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at julie.czech@eccgrp.com

LABORATORY CONTACT: CATHY 615-301-5041

LABORATORY ADDRESS: 2960 Foster Creighton Drive Nashville, TN 37204

0.2°C

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

3/14/2018