

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

CCR LANDFILL
IATAN GENERATING STATION
PLATTE COUNTY, MISSOURI

Presented To:
Evergy Metro, Inc.

SCS ENGINEERS

27213167.21 | January 2022

8575 W 110th Street, Suite 100
Overland Park, Kansas 66210
913-681-0030

CERTIFICATIONS

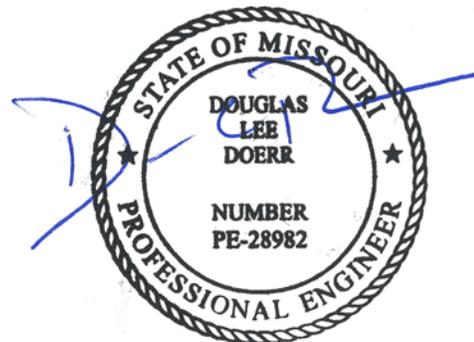
I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify that the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill at the Iatan Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



John R. Rockhold, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify that the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill at the Iatan Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



Douglas L. Doerr, P.E.

SCS Engineers

2021 Groundwater Monitoring and Corrective Action Report

Revision Number	Revision Date	Revision Sections	Summary of Revisions

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1 INTRODUCTION

This 2021 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the “Coal Combustion Residuals (CCR) Final Rule” (Rule) published by the United States Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015), and subsequent revisions. Specifically, this report was prepared for Evergy Metro, Inc. (Evergy) to fulfill the requirements of 40 CFR 257.90 (e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill at the Iatan Generating Station.

1.1 § 257.90(e)(6) SUMMARY

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

1.1.1 § 257.90(e)(6)(i) Initial Monitoring Program

At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the start of the current annual reporting period, (January 1, 2021), the CCR Landfill was operating under a detection monitoring program in compliance with § 257.94.

1.1.2 § 257.90(e)(6)(ii) Final Monitoring Program

At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the end of the current annual reporting period, (December 31, 2021), the CCR Landfill was operating under a detection monitoring program in compliance with § 257.94.

1.1.3 § 257.90(e)(6)(iii) Statistically Significant Increases

If it was determined that there was a statistically significant increase over background for one or more constituents listed in Appendix III to this part pursuant to § 257.94(e):

(A) Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and

Monitoring Event	Monitoring Well	Constituent	ASD
Fall 2020	MW-10	Calcium	Successful
Fall 2020	MW-10	Sulfate	Successful

(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.

Not applicable because an assessment monitoring program was not initiated.

1.1.4 § 257.90(e)(6)(iv) Statistically Significant Levels

If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in Appendix IV to this part pursuant to § 257.95(g) include all of the following:

(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;

Not applicable because there was no assessment monitoring conducted.

(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;

Not applicable because there was no assessment of corrective measures initiated for the CCR Unit.

(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

Not applicable because there was no assessment of corrective measures initiated for the CCR Unit.

(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.

Not applicable because there was no assessment of corrective measures initiated for the CCR Unit.

1.1.5 § 257.90(e)(6)(v) Selection of Remedy

Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

Not applicable because corrective measures are not required.

1.1.6 § 257.90(e)(6)(vi) Remedial Activities

Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

Not applicable because corrective measures are not required.

2 § 257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.1 § 257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A site map with an aerial image showing the CCR Landfill and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR Landfill groundwater monitoring program is provided as **Figure 1** in **Appendix A**.

2.2 § 257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

No new monitoring wells were installed and no wells were decommissioned as part of the CCR groundwater monitoring program for the CCR Landfill in 2021.

2.3 § 257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under § 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Only detection monitoring was required to be conducted during the reporting period (2021). Samples collected in 2021 were collected and analyzed for Appendix III detection monitoring constituents. Results of the sampling events are provided in **Appendix B, Table 1** (Appendix III Detection Monitoring Results), and **Table 2** (Detection Monitoring Field Measurements). These tables include Fall 2020 semiannual detection monitoring event verification sample data collected and analyzed in 2021; Spring 2021 semiannual detection monitoring data, verification sample data; and, the initial Fall 2021 semiannual detection monitoring data. The dates of sample collection are also provided in these tables.

2.4 § 257.90(E)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

There was no transition between monitoring programs in 2021. Only detection monitoring was conducted in 2021.

2.5 § 257.90(e)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in § 257.90 through 257.98.

A summary of potentially required information and the corresponding section of the Rule is provided in the following sections. In addition, the information, if applicable, is provided.

2.5.1 § 257.90(e) Program Status

Status of Groundwater Monitoring and Corrective Action Program.

The groundwater monitoring and corrective action program is in detection monitoring.

Summary of Key Actions Completed.

- a. completion of the Fall 2020 verification sampling and analyses per the certified statistical method,
- b. completion of the statistical evaluation of the Fall 2020 semiannual detection monitoring sampling and analysis event per the certified statistical method,
- c. completion of the 2020 Annual Groundwater Monitoring and Corrective Action Report,
- d. completion of a successful alternative source demonstration for the Fall 2020 semiannual detection monitoring sampling and analysis event,
- e. completion of the Spring 2021 semiannual detection monitoring sampling and analysis event with subsequent verification sampling per the certified statistical method,
- f. completion of the statistical evaluation of the Spring 2021 semiannual detection monitoring sampling and analysis event per the certified statistical method, and
- g. initiation of the Fall 2021 semiannual detection monitoring sampling and analysis event.

2021 Groundwater Monitoring and Corrective Action Report

Description of Any Problems Encountered.

No noteworthy problems were encountered.

Discussion of Actions to Resolve the Problems.

Not applicable because no noteworthy problems were encountered.

Projection of Key Activities for the Upcoming Year (2022).

Completion of verification sampling and data analysis, and the statistical evaluation of Fall 2021 detection monitoring sampling and analysis event. Semiannual Spring and Fall 2022 groundwater sampling and analysis. Completion of the statistical evaluation of the Spring 2022 detection monitoring sampling and analysis event, and, if required, alternative source demonstration(s).

2.5.2 § 257.94(d)(3) Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because no alternative monitoring frequency for detection monitoring and certification was pursued.

2.5.3 § 257.94(e)(2) Detection Monitoring Alternate Source Demonstration

Demonstration that a source other than the CCR unit caused the statistically significant increase (SSI) over background levels for a constituent or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. In addition, certification of the demonstration is to be included in the annual report.

The following demonstration reports are included as **Appendix C**:

CCR Groundwater Monitoring Alternative Source Demonstration Report November 2020
Groundwater Monitoring Event, CCR Landfill, Iatan Generating Station (May 2021).

2.5.4 § 257.95(c)(3) Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because there was no assessment monitoring conducted.

2.5.5 § 257.95(d)(3) Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the concentrations of Appendix III and detected Appendix IV constituents from the assessment monitoring, the established background concentrations, and the established groundwater protection standards.

Not applicable because there was no assessment monitoring conducted.

2.5.6 § 257.95(g)(3)(ii) Assessment Monitoring Alternate Source Demonstration

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

2.5.7 § 257.96(a) Demonstration for Additional Time for Assessment of Corrective Measures

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that

the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

2.6 § 257.90(e)(6) OVERVIEW SUMMARY

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.

§ 257.90(e)(6) is addressed in Section 1.1 of this report.

3 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. The information contained in this report is a reflection of the conditions encountered at the Iatan Generating Station at the time of fieldwork. This report includes a review and compilation of the required information and does not reflect any variations of the subsurface, which may occur between sampling locations. Actual subsurface conditions may vary and the extent of such variations may not become evident without further investigation.

Conclusions drawn by others from the result of this work should recognize the limitation of the methods used. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Metro, Inc. for specific application to the Iatan Generating Station CCR Landfill. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map

Figure 2: Potentiometric Surface Map (May 2021)

Figure 3: Potentiometric Surface Map (November 2021)

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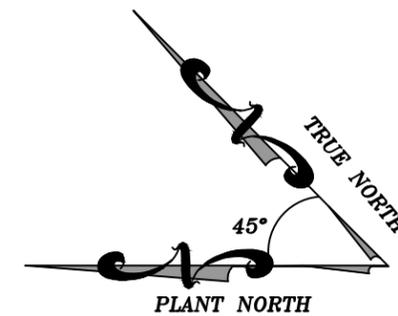


LEGEND:

- MW-1 CCR GROUNDWATER MONITORING WELL SYSTEM
- UTILITY WASTE LANDFILL UNIT BOUNDARY

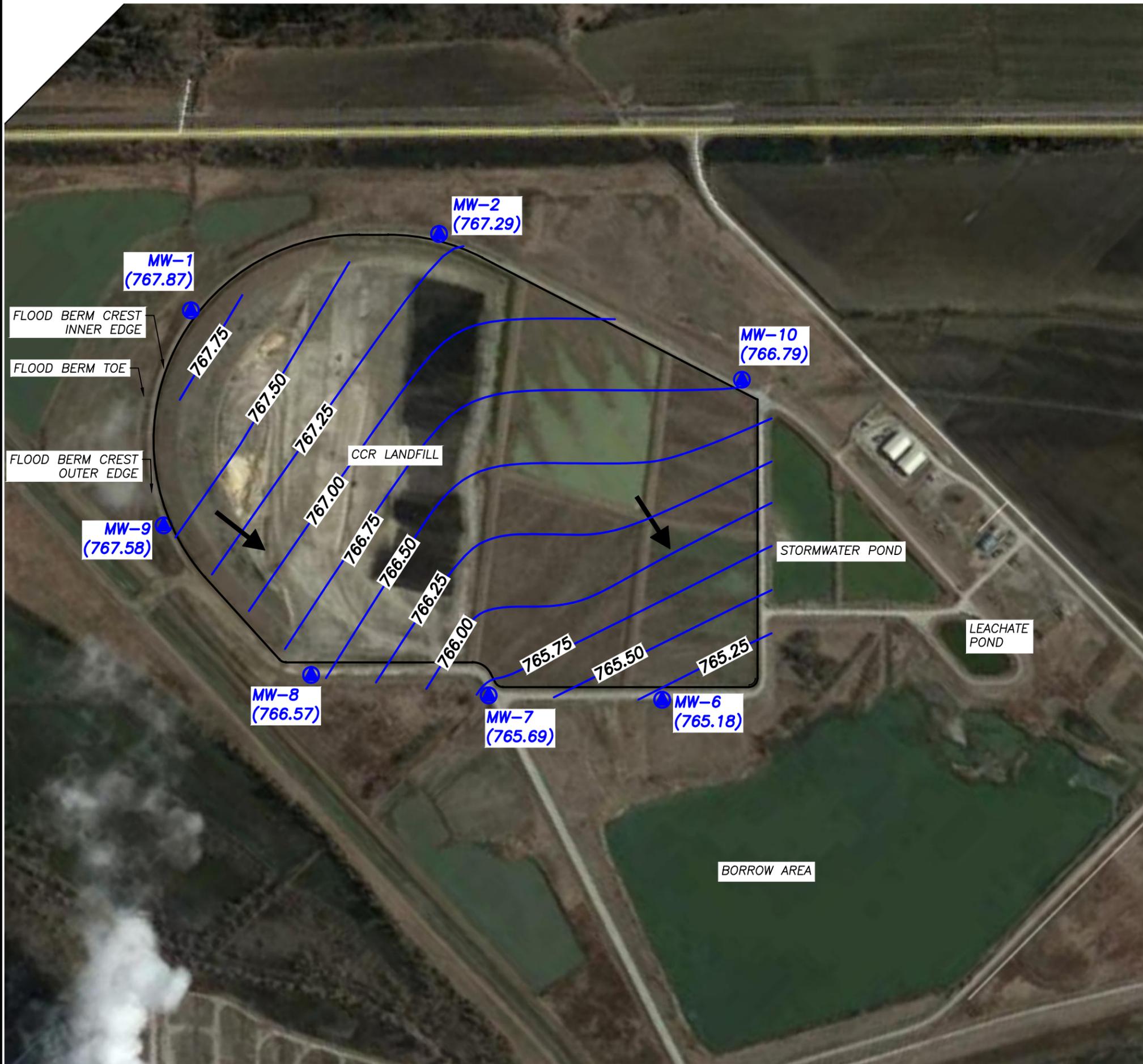
NOTES:

1. HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE (NAD 83)
2. VERTICAL DATUM: NAVD 88
3. GOOGLE EARTH IMAGE DATED FEBRUARY 2020. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE
4. BOUNDARY AND MONITOR WELL LOCATIONS PROVIDED BY BURNS & MCDONNELL
5. CCR LANDFILL UNIT BOUNDARY SHOWN IS APPROXIMATE.



CK: BY	-	REV. DATE	-	SHEET TITLE	SITE MAP	PROJECT TITLE	2021 GROUNDWATER MONITORING AND CORRECTION ACTION REPORT
	-		-		CCR LANDFILL		
CLIENT	KANSAS CITY POWER & LIGHT COMPANY IATAN GENERATING STATION IATAN, MISSOURI						
SCS ENGINEERS	8575 W. 110th St. Ste. 100 Overland Park, MO 66210 PH: (813) 681-0080 FAX: (813) 681-0012 PROJ. NO. 27213167.20 DSN: BF: ALR DWN: BY: ALR Q/A: RW: JRR CHK: BF: ALR CHK: BF: JRR PROJ. MGR: JRR						
CADD FILE:	IATAN LF CCR BASE 2021.DWG						
DATE:	1/11/22						
FIGURE NO.	1						

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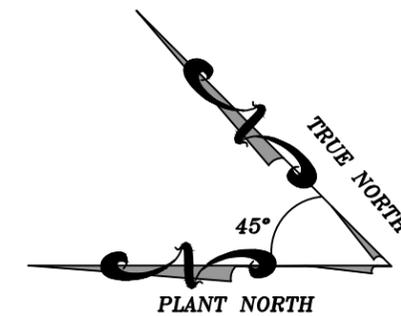


LEGEND:

- 767.0— GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS
- **MW-1**
773.09 CCR GROUNDWATER MONITORING WELL SYSTEM
- CCR LANDFILL UNIT BOUNDARY
- ➔ GROUNDWATER FLOW DIRECTION

NOTES:

1. HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE (NAD 83)
2. VERTICAL DATUM: NAVD 88
3. GOOGLE EARTH IMAGE DATED FEBRUARY 20, 2020. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE
4. BOUNDARY AND MONITOR WELL LOCATIONS PROVIDED BY BURNS & MCDONNELL
5. MONITOR WELL LOCATIONS AND CCR LANDFILL UNIT BOUNDARY SHOWN ARE APPROXIMATE.



CK:					
BY:					
REV:					
DATE:					
SHEET TITLE	POTENTIOMETRIC SURFACE MAP (MAY 2021)				
PROJECT TITLE	IATAN GROUNDWATER 2021				
CLIENT	EVERGY METRO, INC. IATAN GENERATING STATION IATAN, MISSOURI				
SCS ENGINEERS	8575 W. 110th St. Ste. 100 Overland Park, MO 66210 PH: (913) 681-0080 FAX: (913) 681-0012 PROJ. NO. 27213167.21 DSK: BF: TCW DWN: BY: ALR CHK: BF: JRR Q/A: RW: BY: JRR PROJ. MGR: JRR				
CADD FILE:	IATAN LF FIG 2 MAY 2021 V.3.DWG				
DATE:	1/26/22				
FIGURE NO.	2				

N:\KCP\Projects\Groundwater\Annual CCR Reporting\2021\Iatan LF Fig 2 November 2021 V2.dwg Jan 26, 2022 - 1:34pm Layout Name: Fig 2-CCR By: 4415air

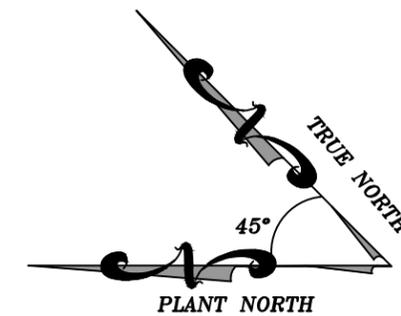


LEGEND:

- 767.0— GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS
- MW-1
773.09 CCR GROUNDWATER MONITORING WELL SYSTEM
- CCR LANDFILL UNIT BOUNDARY
- ➔ GROUNDWATER FLOW DIRECTION

NOTES:

1. HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE (NAD 83)
2. VERTICAL DATUM: NAVD 88
3. GOOGLE EARTH IMAGE DATED FEBRUARY 20, 2020. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE
4. BOUNDARY AND MONITOR WELL LOCATIONS PROVIDED BY BURNS & MCDONNELL
5. MONITOR WELL LOCATIONS AND CCR LANDFILL UNIT BOUNDARY SHOWN ARE APPROXIMATE.



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1					
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SHEET TITLE		POTENTIOMETRIC SURFACE MAP (NOVEMBER 2021)			
PROJECT TITLE		IATAN GROUNDWATER 2021			
CLIENT					
EVERGY METRO, INC. IATAN GENERATING STATION IATAN, MISSOURI					
SCS ENGINEERS					
<small> 8575 W. 110th St. Ste. 100 Overland Park, MO 66204 PH: (913) 681-0080 FAX: (913) 681-0012 PROJ. NO. 27213167.21 DSN: BT TCW DWN: BY: ALR CHK: BT: JRR Q/A: RW: BY: JRR PROJ. MGR: JRR </small>					
CADD FILE: IATAN LF FIG 2 NOVEMBER 2021 V2.DWG					
DATE: 1/26/22					
FIGURE NO. 3					

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
CCR Landfill
Appendix III Detection Monitoring Results
Evergy Iatan Generating Station

Well Number	Sample Date	Appendix III Constituents						Total Dissolved Solids (mg/L)
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	
MW-1	02/02/21	---	---	---	---	**7.36	---	*484
MW-1	05/20/21	<0.200	137	5.59	0.257	7.34	33.3	500
MW-1	11/17/21	<0.200	152	6.48	0.314	6.89	35.4	537
MW-2	05/20/21	<0.200	167	6.45	0.316	7.05	126	611
MW-2	11/17/21	<0.200	165	6.68	0.371	6.80	114	595
MW-6	02/02/21	---	*164	---	---	**6.97	---	---
MW-6	03/01/21	---	*153	---	---	**7.15	---	---
MW-6	05/20/21	<0.200	188	2.75	0.274	6.26	46.9	619
MW-6	07/20/21	---	*147	*1.56	---	*6.93	*31.6	*542(H)
MW-6	08/04/21	---	---	---	---	**6.99	---	*550
MW-6	11/17/21	<0.200	147	2.12	0.344	7.08	32.2	508
MW-7	05/20/21	<0.200	148	6.03	0.342	6.40	57.2	513
MW-7	07/20/21	---	---	---	---	*7.54	---	---
MW-7	11/17/21	<0.200	112	1.72	0.383	7.05	31.0	446
MW-8	02/02/21	---	---	*8.22	---	**7.18	---	*518
MW-8	05/20/21	<0.200	127	1.34	0.364	6.50	17.3	426
MW-8	07/20/21	---	---	---	---	*7.87	---	---
MW-8	11/17/21	<0.200	178	14.4	0.404	7.17	91.0	640
MW-9	02/02/21	---	*106	---	---	**7.00	---	---
MW-9	05/20/21	<0.200	98.4	<1.00	0.367	6.48	19.7	384
MW-9	07/20/21	---	---	---	---	*7.33	---	---
MW-9	11/17/21	<0.200	106	<1.00	0.440	7.04	19.2	394
MW-10	02/02/21	---	*160	---	---	**7.08	*46.7	---
MW-10	03/01/21	---	*160	---	---	**7.08	*48.4	---
MW-10	05/20/21	<0.200	148	16.5	0.457	6.32	46.7	628
MW-10	07/20/21	---	---	---	---	*6.93	*38.6	---
MW-10	11/17/21	<0.200	131	17.6	0.629	7.01	35.7	491

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.

**Extra Sample for Quality Control Validation or per Standard Sampling Procedure

mg/L - milligrams per liter

pCi/L - picocuries per liter

S.U. - Standard Units

--- Not Sampled

(H) Out of Hold Analysis

**Table 2
CCR Landfill
Detection Monitoring Field Measurements
Evergy Iatan Generating Station**

Well Number	Sample Date	pH (S.U.)	Specific Conductivity (µS)	Temperature (°C)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Water Level (ft btoc)	Groundwater Elevation (ft NGVD)
MW-1	02/02/21	**7.36	800	11.6	4.3	-68	0.00	22.28	766.41
MW-1	05/20/21	7.34	880	14.33	2.9	-141	1.96	20.82	767.87
MW-1	11/17/21	6.89	938	13.88	3.9	-128	0.00	22.78	765.91
MW-2	05/20/21	7.05	1030	15.22	5.1	-143	3.44	22.32	767.29
MW-2	11/17/21	6.80	1040	14.07	5.0	-126	0.00	23.80	765.81
MW-6	02/02/21	**6.97	1050	14.26	0.0	-119	0.32	24.48	765.17
MW-6	03/01/21	**7.15	896	14.20	5.9	-118	2.53	25.26	764.39
MW-6	05/20/21	6.26	1140	16.00	0.0	-137	0.00	24.47	765.18
MW-6	07/20/21	*6.93	846	17.08	7.9	-119	0.42	23.53	766.12
MW-6	08/04/21	**6.99	843	17.11	4.5	-99	0.69	24.05	765.60
MW-6	11/17/21	7.08	921	14.96	2.1	-132	0.00	24.93	764.72
MW-7	05/20/21	6.40	786	15.84	0.0	-47	0.00	23.96	765.69
MW-7	07/20/21	*7.54	765	15.55	6.1	-59	0.00	23.34	766.31
MW-7	11/17/21	7.05	789	14.36	11.6	-57	1.76	24.75	764.90
MW-8	02/02/21	**7.18	964	14.00	8.8	-89	0.40	24.41	765.30
MW-8	05/20/21	6.50	885	15.81	0.0	-102	0.00	23.14	766.57
MW-8	07/20/21	*7.87	903	15.60	7.1	-137	0.00	23.15	766.56
MW-8	11/17/21	7.17	1050	14.52	3.7	-106	5.60	24.54	765.17
MW-9	02/02/21	**7.00	676	10.67	30.9	-84	0.00	23.84	766.06
MW-9	05/20/21	6.48	715	16.49	0.0	-131	0.00	22.32	767.58
MW-9	07/20/21	*7.33	684	17.86	38.1	-156	0.95	22.61	767.29
MW-9	11/17/21	7.04	747	13.87	13.9	-118	0.00	24.32	765.58
MW-10	02/02/21	**7.08	1060	11.79	3.3	-20	0.00	23.22	766.24
MW-10	03/01/21	**7.08	1080	14.59	17.2	-32	2.51	24.29	765.17
MW-10	05/20/21	6.32	1140	16.39	0.0	-85	0.00	22.67	766.79
MW-10	07/20/21	*6.93	948	16.36	0.0	-23	0.25	22.24	767.22
MW-10	11/17/21	7.01	1080	14.61	0.0	-78	0.00	23.84	765.62

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.

**Extra Sample for Quality Control Validation or per Standard Sampling Procedure

S.U. - Standard Units

µS - microsiemens

°C - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit

APPENDIX C

CCR Groundwater Monitoring Alternative Source Demonstration
Report November 2020 Groundwater Monitoring Event, CCR
Landfill, Iatan Generating Station (May 2021)

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
NOVEMBER 2020 GROUNDWATER MONITORING EVENT

CCR LANDFILL

Iatan Generating Station
Evergy Metro, Inc.
Platte County, Missouri

SCS ENGINEERS

May 2021
File No. 27213167.20

8575 W. 110th Suite 100
Overland Park, KS 66210
913-749-0700

CERTIFICATIONS

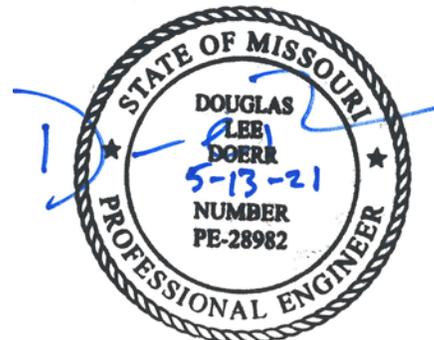
I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill at the Iatan Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted hydrogeological practices and the local standard of care.



John R. Rockhold, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill at the Iatan Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted engineering practices and the local standard of care.



Douglas L. Doerr, P.E.

SCS Engineers

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3 Alternative Source Demonstration.....	2
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Appendices

Appendix A	Box and Whiskers Plots
Appendix B	Potentiometric Surface Map (November 2020)
Appendix C	Piper Diagram Plots and Analytical Results
Appendix D	Time Series Plots

1 REGULATORY FRAMEWORK

Certain owners or operators of Coal Combustion Residuals (CCR) units are required to complete groundwater monitoring activities to evaluate whether a release from the unit has occurred. Included in the activities is the completion of a statistical analysis of the groundwater quality data as prescribed in § 257.93(h) of the CCR Final Rule. If the initial analysis indicates a statistically significant increase (SSI) over background levels, the owner or operator may perform an alternative source demonstration (ASD). In accordance with § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate that a source other than the CCR unit caused the SSI over background levels for a constituent, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a SSI over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under § 257.94. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the CCR Landfill at the Iatan Generating Station has been completed in substantial compliance with the “Statistical Method Certification by A Qualified Professional Engineer” dated October 12, 2017. Groundwater samples were collected on November 9, 2020. Review and validation of the results from the November 2020 Detection Monitoring Event was completed on December 18, 2020, which constitutes completion and finalization of detection monitoring laboratory analyses. Statistical analysis was then conducted to determine whether there was a statistically significant increase (SSI) over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on February 2, 2021 and March 1, 2021.

The completed statistical evaluation identified two Appendix III constituents above the prediction limits established for monitoring well MW-10.

Constituent/Monitoring Well	*UPL	Observation November 9, 2020	1st Verification February 2, 2021	2nd Verification March 1, 2021
Calcium				
MW-10	154.2	158	160	160
Sulfate				
MW-10	39.5	42.3	46.7	48.4

*UPL – Upper Prediction Limit

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified SSIs above the background prediction limits for calcium and sulfate at monitoring well MW-10.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration (ASD) is a means to provide supporting lines of evidence that something other than a release from a regulated CCR unit caused an SSI. For the above identified SSI for the CCR Landfill at the Iatan Generating Station, there are multiple lines of supporting evidence to indicate the above SSIs were not caused by a release from the CCR Landfill. Select multiple lines of supporting evidence are described as follows.

3.1 BOX AND WHISKERS PLOTS

A commonly accepted method to demonstrate and visualize the distribution of data in a given data set is to construct box and whiskers plots. The basic box plotted graphically locates the median, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

When comparing multiple wells or well groups, box plots for each well can be lined up on the same axis to roughly compare the variability in each well. This may be used as an exploratory screening for the test of homogeneity of variance across multiple wells.

Box and whiskers plots for all of the groundwater monitoring system wells were prepared to allow comparison of the calcium and sulfate concentrations between MW-10 and the other monitoring wells both upgradient and downgradient. The calcium box and whiskers plot for MW-10 indicates the calcium concentrations at MW-10 are within or below the concentration ranges for the other wells. The sulfate box and whiskers plot for MW-10 indicates the sulfate concentrations at MW-10 are within or below the concentration ranges for the other wells. Box and whisker plots are provided in **Appendix A**. Additionally, MW-10 is located upgradient of the landfill for this sampling event as shown on the potentiometric surface map provided in **Appendix B**. This demonstrates that a source other than the CCR Landfill caused the SSI over background levels, or that the SSI resulted from natural variation in groundwater quality.

3.2 PIPER DIAGRAM PLOTS

Piper diagrams are a form of tri-linear diagram, and a widely-accepted method to provide a visual representation of the ion concentration of groundwater. Piper diagrams portray water compositions and facilitate the interpretation and presentation of chemical analyses. They may be used to visually compare the chemical composition of water quality across wells, and aid in determining whether the waters are similar or dis-similar, and can over time indicate whether the waters are mixing.

A piper diagram has two triangular plots on the right and left side of a 4-sided center field. The three major cations are plotted in the left triangle and anions in the right. Each of the three cation/anion variables, in milliequivalents, is divided by the sum of the three values, to produce a percent of total cation/anions. These percentages determine the location of the associated symbol. The data points in the center field are located by extending the points in the lower triangles to the point of intersection. In order for a piper diagram to be produced, the selected data file must contain the following constituents: Sodium (Na),

Potassium (K), Calcium (Ca), Magnesium (Mg), Chloride (Cl), Sulfate (SO₄), Carbonate (CO₃), and Bicarbonate (HCO₃).

A piper diagram generated for MW-10 and leachate is provided in **Appendix C** along with analytical results. The piper diagram indicates the groundwater from monitoring well MW-10 does not plot near where the leachate plots and is not trending toward the leachate over time. Therefore, the groundwater from MW-10 does not exhibit the same geochemical characteristics as the leachate. The groundwater and the leachate plot in totally different hydrochemical facies indicating there is no mixing of the two types of water (groundwater and leachate). This demonstrates that a source other than the CCR Landfill caused the SSI over background levels or that the SSI resulted from natural variation in groundwater quality.

3.3 TIME SERIES PLOTS

Time series plots provide a graphical method to view changes in data at a particular well (monitoring point) or wells over time. Time series plots display the variability in concentration levels over time and can be used to indicate possible outliers or data errors (i.e. “spikes”). More than one well can be compared on the same plot to look for differences between wells. Non-detect data is plotted as censored data at one-half of the laboratory reporting limit. Time series plots can also be used to examine the data for trends.

The time series plot for calcium and sulfate at monitoring well MW-10 was compared to the time series plot for sulfate at the other monitoring wells both upgradient and downgradient. The sulfate time series plot for MW-10 indicates the sulfate concentrations in MW-10 are generally below the concentrations in the other wells both upgradient and downgradient. The sulfate time series plot for MW-10 indicates the sulfate concentrations in MW-10 are generally below the concentrations in the other wells both upgradient and downgradient. This demonstrates that a source other than the CCR Landfill caused the SSI over background levels, or that the SSI resulted from natural variation in groundwater quality. Time series plots are provided in **Appendix D**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the CCR Landfill caused the SSIs over background levels, or that the SSIs resulted from natural variation in groundwater quality. Based on the successful ASD, the owner or operator of the CCR Landfill may continue with the detection monitoring program under § 257.94.

5 GENERAL COMMENTS

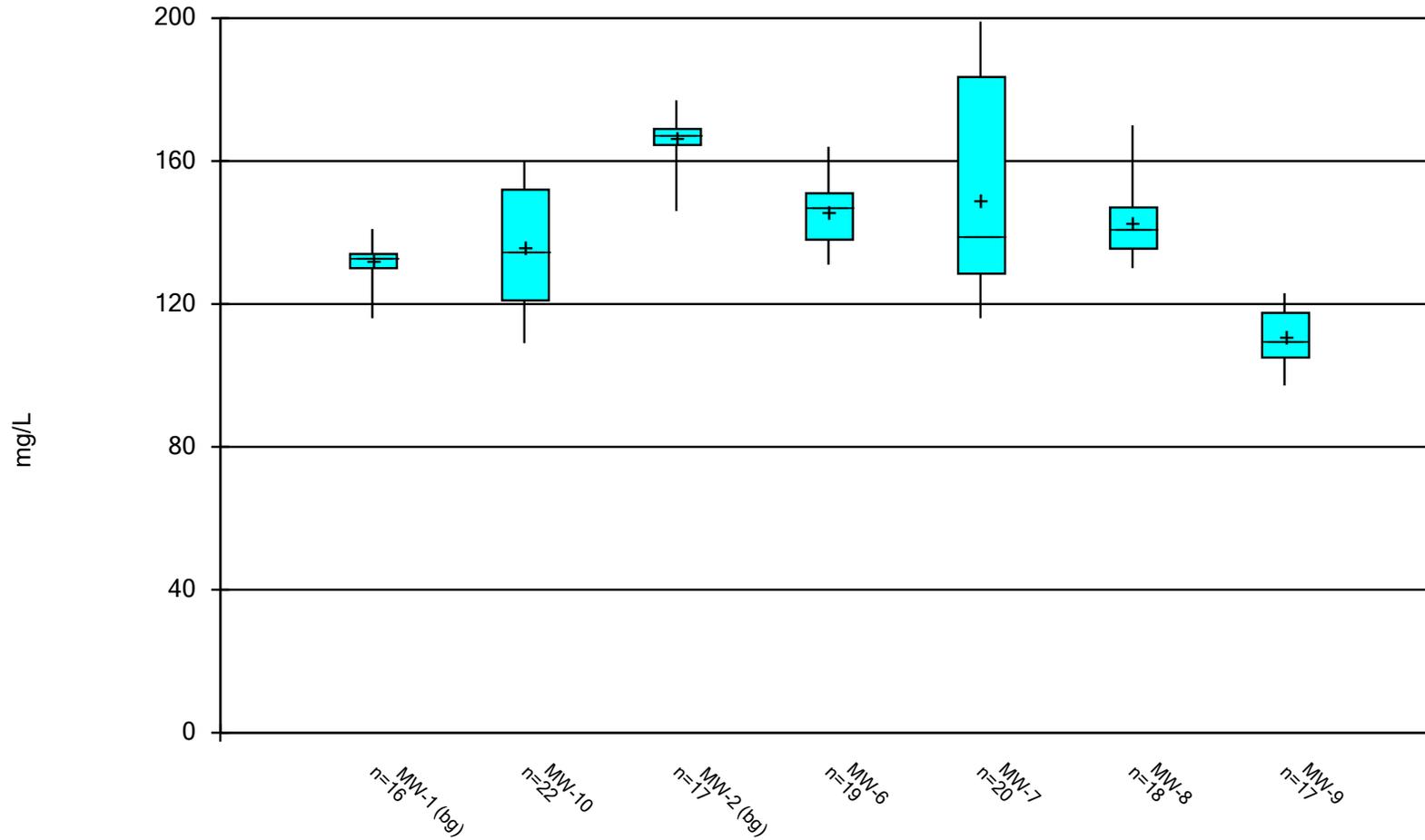
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client’s directives. It is intended for the exclusive use of Evergy Metro, Inc. for specific application to the Iatan Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represents that to the best of their knowledge, information, and belief in the exercise of their professional judgement in accordance with the standard of practice, it is their professional opinions that the aforementioned information is accurate as of the date of such signatures. Any opinion or decisions by them are made on the basis of their experience, qualifications, and professional judgement and are not to be construed as warranties or guaranties. In addition, opinions relating to regulatory, environmental, geologic, geochemical and geotechnical conditions interpretations or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

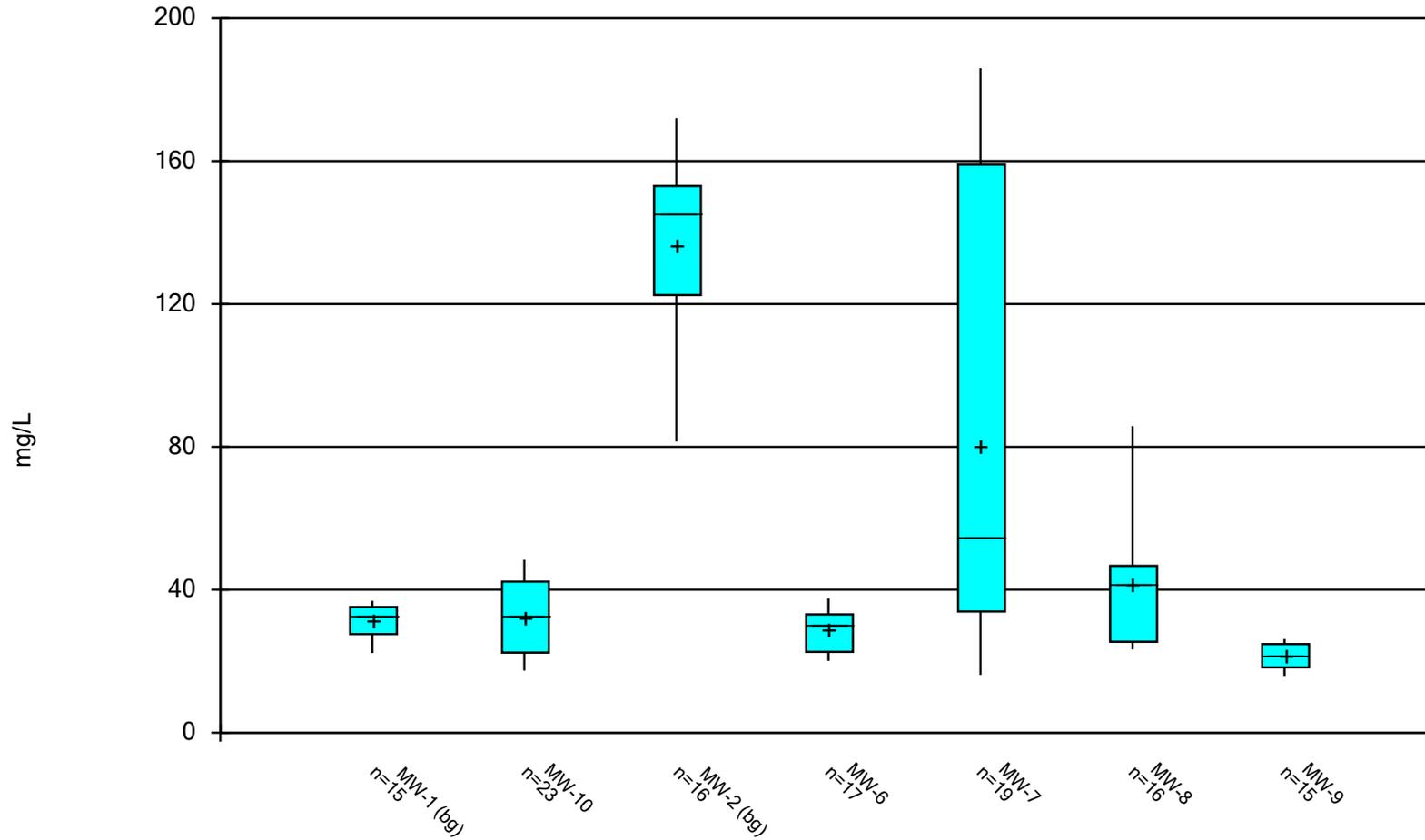
Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Calcium Analysis Run 4/28/2021 8:10 AM View: CCR LF III
latan Utility Waste LF Client: SCS Engineers Data: latan jrr

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 4/28/2021 8:10 AM View: CCR LF III
latan Utility Waste LF Client: SCS Engineers Data: latan jrr

Box & Whiskers Plot

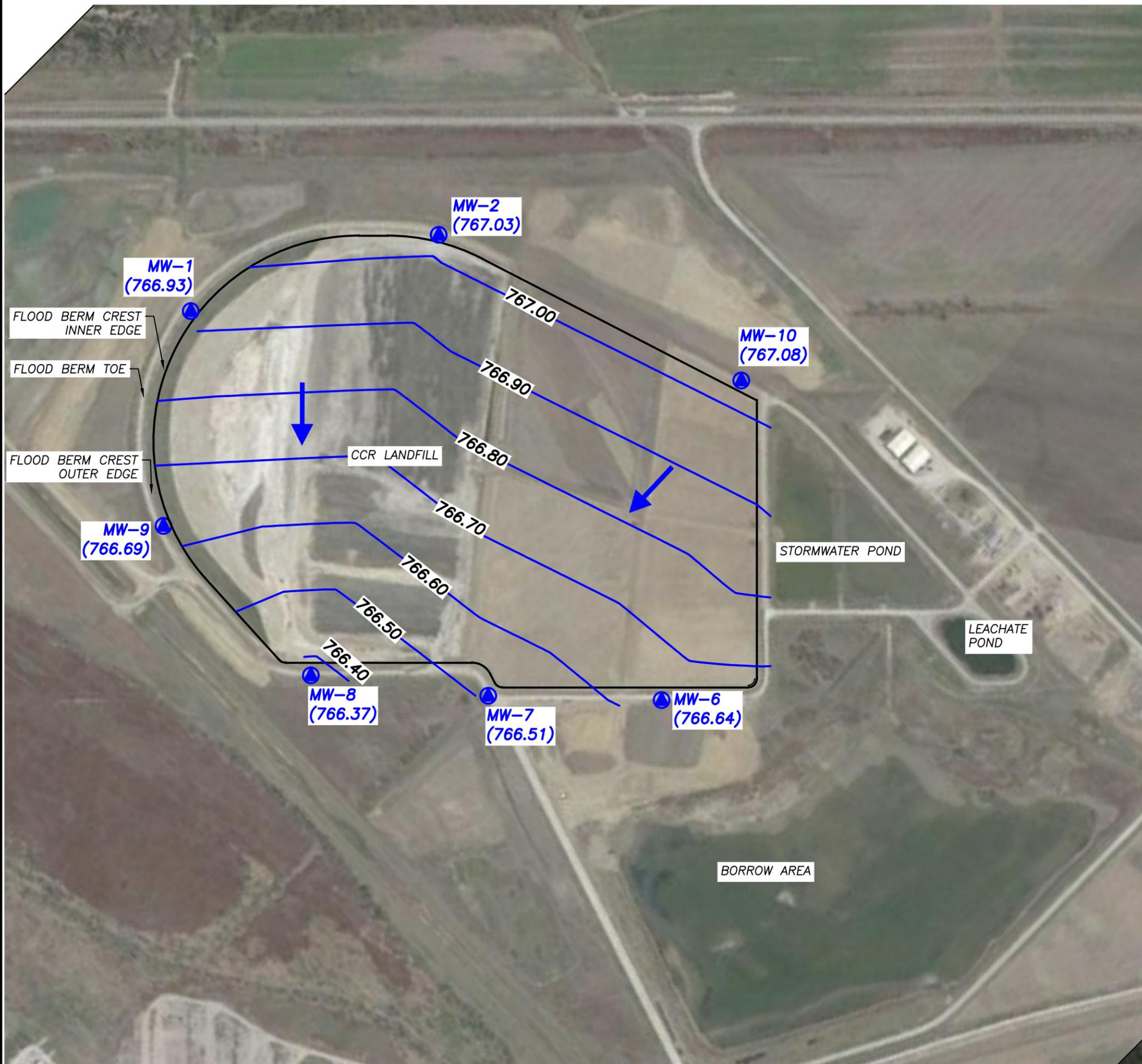
Iatan Utility Waste LF Client: SCS Engineers Data: Iatan jrr Printed 4/28/2021, 8:12 AM

<u>Constituent</u>	<u>Well</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Std. Err.</u>	<u>Median</u>	<u>Min.</u>	<u>Max.</u>	<u>%NDs</u>
Calcium (mg/L)	MW-1 (bg)	16	131.9	5.372	1.343	133	116	141	0
Calcium (mg/L)	MW-10	22	136	16.85	3.593	134.5	109	160	0
Calcium (mg/L)	MW-2 (bg)	17	166.4	6.509	1.579	167	146	177	0
Calcium (mg/L)	MW-6	19	146.1	8.953	2.054	147	131	164	0
Calcium (mg/L)	MW-7	20	149.3	27.33	6.112	139	116	199	0
Calcium (mg/L)	MW-8	18	142.9	10.01	2.36	141	130	170	0
Calcium (mg/L)	MW-9	17	110.7	7.577	1.838	110	97.2	123	0
Sulfate (mg/L)	MW-1 (bg)	15	31.48	4.407	1.138	32.6	22.3	36.9	0
Sulfate (mg/L)	MW-10	23	32.21	10.8	2.253	33	17.4	48.4	0
Sulfate (mg/L)	MW-2 (bg)	16	136.6	24.1	6.026	145.5	81.5	172	0
Sulfate (mg/L)	MW-6	17	28.84	5.89	1.428	30.2	20.1	37.6	0
Sulfate (mg/L)	MW-7	19	80.61	61.89	14.2	54.4	16.2	186	0
Sulfate (mg/L)	MW-8	16	41.38	16.28	4.069	41.85	23.3	85.8	0
Sulfate (mg/L)	MW-9	15	21.44	3.34	0.8624	21.5	15.9	26.2	0

Appendix B

Potentiometric Surface Map

N:\KCP\Projects\Groundwater\DWG\Iatan\2020\Iatan LF CCR MDNR Fig 2 NOV20 v3.dwg, May 12, 2021 - 9:02am Layout Name: Fig 2-CCR By: 4415air

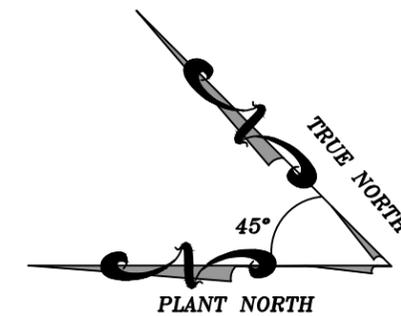


LEGEND:

- 767.0— GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS
- MW-1
773.09 CCR GROUNDWATER MONITORING WELL SYSTEM
- UTILITY WASTE LANDFILL UNIT BOUNDARY

NOTES:

1. HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE (NAD 83)
2. VERTICAL DATUM: NAVD 88
3. GOOGLE EARTH IMAGE DATED FEBRUARY 20, 2020. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE
4. BOUNDARY AND MONITOR WELL LOCATIONS PROVIDED BY BURNS & MCDONNELL
5. MONITOR WELL LOCATIONS AND CCR LANDFILL UNIT BOUNDARY SHOWN ARE APPROXIMATE.



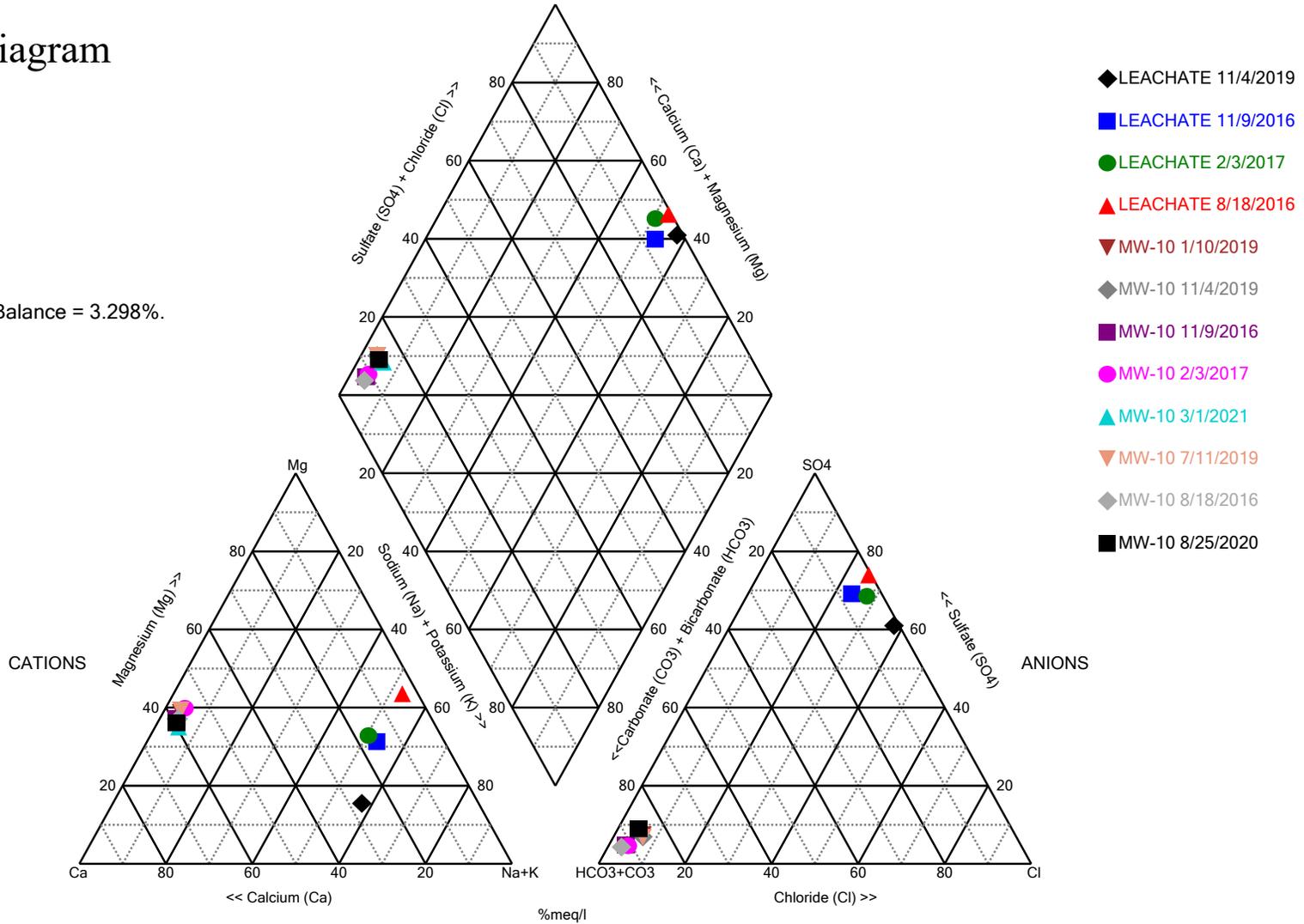
CK BY	-	-	-	-	-
REV DATE	-	-	-	-	-
SHEET TITLE	POTENTIOMETRIC SURFACE MAP (NOVEMBER 2020)				
PROJECT TITLE	IATAN GROUNDWATER 2020				
CLIENT	EVERGY METRO, INC. IATAN GENERATING STATION IATAN, MISSOURI				
SCS ENGINEERS	6875 W. 110th St. Ste. 100 Overland Park, MO 66204 PH: (913) 681-0080 FAX: (913) 681-0012 PROJ. NO. 27213167.20 DSK: BY: TCW DWN: BY: ALR CHK: BY: JRR Q/A: BY: JRR PROJ. MGR: JRR				
CADD FILE:	IATAN LF CCR MDNR FIG 2 NOV20 V3.DWG				
DATE:	5/12/21				
FIGURE NO.	1				

Appendix C

Piper Diagram Plots and Analytical Results

Piper Diagram

Cation-Anion Balance = 3.298%.



Analysis Run 4/2/2021 4:17 PM View: CCR LF III

latan Utility Waste LF Client: SCS Engineers Data: latan jrr

Piper Diagram

Analysis Run 4/2/2021 4:19 PM View: CCR LF III

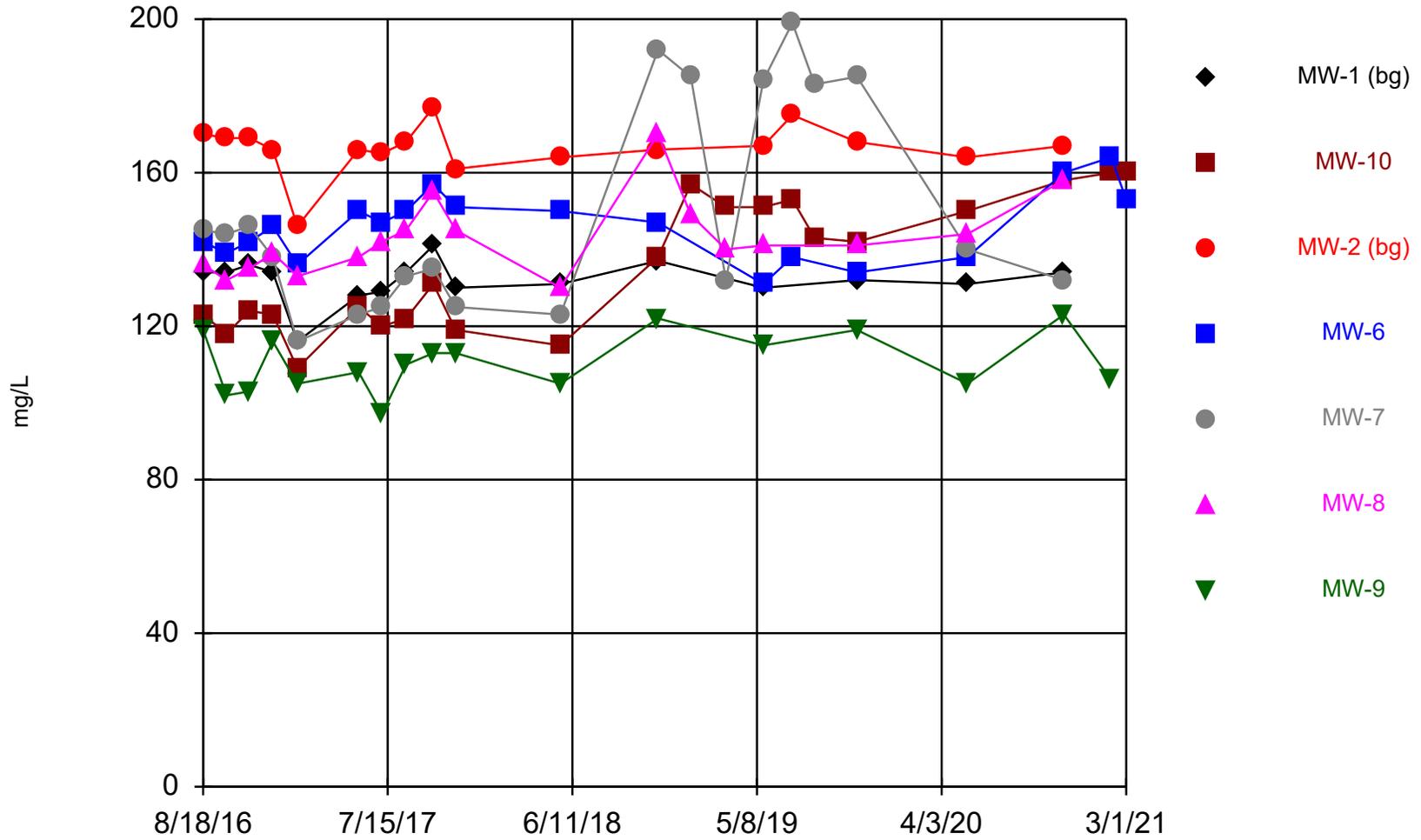
Iatan Utility Waste LF Client: SCS Engineers Data: Iatan jrr

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
MW-10 8/18/2016	7.77	4.45	123	47.3	7.47	17.8	480	10
MW-10 11/9/2016	7.11	4.02	124	47.3	9.15	17.4	428	10
MW-10 2/3/2017	7.2	3.93	109	46.7	10.3	19.1	442	10
MW-10 1/10/2019	8.51	5.08	157	64.3	21	38	555	10
MW-10 7/11/2019	8.12	5.11	153	63.8	22.5	33	537	10
MW-10 11/4/2019	7.41	4.57	142	54.2	21.6	33.6	526	10
MW-10 8/25/2020	11.9	4.51	163	59.1	16.4	47.9	589	10
MW-10 3/1/2021	14.9	4.56	160	56.5	17.1	48.4	570	10
LEACHATE 8/18/2016	9250	689	573	4240	6990	28000	644	10
LEACHATE 11/9/2016	1230	90.7	334	398	876	3460	480	10
LEACHATE 2/3/2017	1880	121	560	671	1760	6070	505	10
LEACHATE 11/4/2019	1110	51.7	460	163	2340	5230	206	10

Appendix D

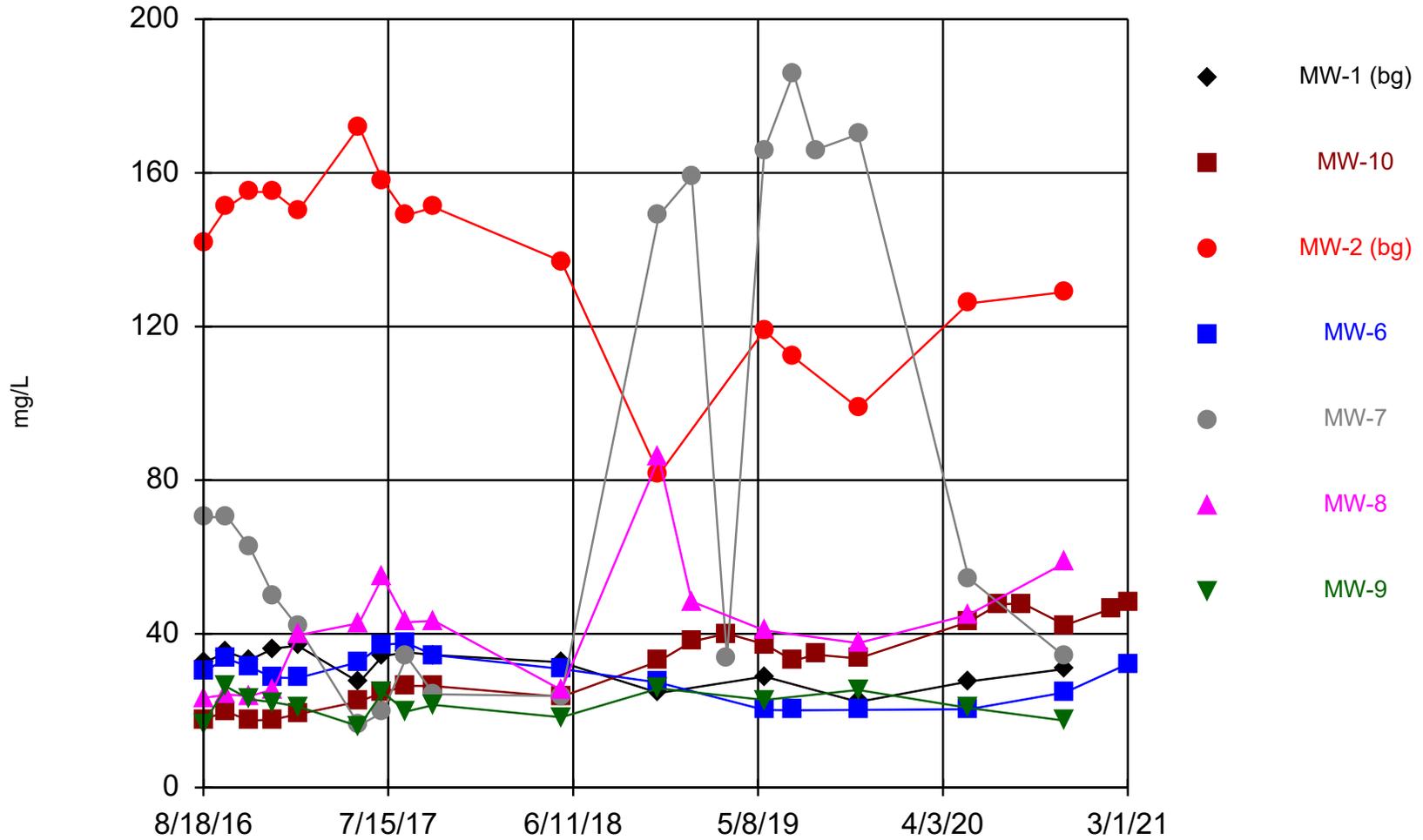
Time Series Plots

Time Series



Constituent: Calcium Analysis Run 4/28/2021 8:05 AM View: CCR LF III
latan Utility Waste LF Client: SCS Engineers Data: latan jrr

Time Series



Constituent: Sulfate Analysis Run 4/28/2021 8:05 AM View: CCR LF III
latan Utility Waste LF Client: SCS Engineers Data: latan jrr