2019-2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

ASH IMPOUNDMENT
IATAN GENERATING STATION
Platte County, MISSOURI

Presented To:
Evergy Metro, Inc.

SCS ENGINEERS

27213167.20 | July 2020

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

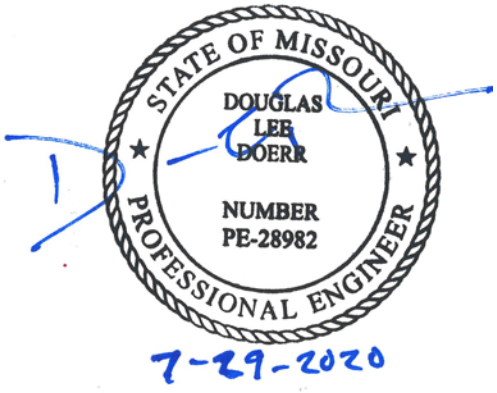
CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify that the 2019-2020 Annual Groundwater Monitoring and Corrective Action Report for the Ash Impoundment 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 2019-2020 Annual Groundwater Monitoring and Corrective Action Report for the Ash Impoundment 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

Revision Number	Revision Date	Revision Section	Summary of Revisions

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Section **Page**

Appendices

1 INTRODUCTION

This 2019-2020 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) update published August 5, 2016 ("Extension Rule) to provide an extension of compliance deadlines for certain inactive surface impoundments. The Ash Impoundment is classified as an "inactive" CCR unit and is therefore regulated by the August 5, 2016 update to the Rule subject to the new 40 CFR 257.100(e). Owners and operators of inactive CCR surface impoundments subject to the provisions of the new 40 CFR 257.100(e)(5)(ii) are required to prepare an annual groundwater monitoring and corrective action report no later than July 31, 2020 per 40 CFR 257.90(e).

Specifically, this report was prepared for Evergy Metro, Inc. (f/k/a Kansas City Power & Light Company) to fulfill the requirements of 40 CFR 257.90(e). Changes to the text of 40 CFR 257.90(e) to indicate the update subject to the new 40 CFR 257.100(e) are shown in [brackets] and specific references to active CCR unit or expansions have been deleted. The applicable sections of the Rule are provided below in italics, followed by applicable information relative to the 2019-2020 Annual Groundwater Monitoring and Corrective Action Report for the Ash Impoundment at the Iatan Generating Station.

2 § 257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For [inactive] CCR surface impoundments, no later than [July 31, 2019], and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For [inactive] CCR surface impoundments, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than [July 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 Ash Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the Ash Impoundment 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 Ash Impoundment within the 2019-2020 monitoring period.

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 conducted during the reporting period (2019-2020). Samples collected in Fall 2019 and Spring of 2020 were collected and analyzed for Appendix III detection monitoring constituents as indicated in **Appendix B**, **Table 1** (Appendix III Detection Monitoring Results, and **Table 2** (Detection Monitoring Field Measurements). The dates of sample collection, the monitoring program requiring the sample, and the results of the analyses are also provided in these tables. These tables include Spring 2019 second verification monitoring data, the Fall 2019 semiannual detection monitoring and verification monitoring data, and the Spring 2020 semiannual detection monitoring data with no verification sample data, which was not completed at the time of this report.

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 2019-2020. Only detection monitoring was conducted in the 2019-2020 annual reporting period.

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 Spring 2019 verification sampling and analyses per the certified statistical method,

b. completion of the statistical evaluation of the Spring 2019 semiannual detection monitoring sampling and analysis event per the certified statistical method,

c. completion of a successful alternative source demonstration for the Spring 2019 semiannual detection monitoring event,

d. completion of the Fall 2019 semiannual detection monitoring sampling and analysis event, and subsequent verification sampling per the certified statistical method,

e. completion of the statistical evaluation of the Fall 2019 semiannual detection monitoring event per the certified statistical method,

f. completion of a successful alternative source demonstration for the Fall 2019 semiannual detection monitoring event,

g. initiation of the Spring 2020 semiannual detection monitoring sampling and analysis event, and

h. completion of the 2019-2020 Annual 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 (2020-2021).

Completion of verification sampling and data analysis, and the statistical evaluation for the Spring 2020 detection monitoring event, and, if required, alternative source demonstration(s). Fall 2020 semiannual groundwater sampling, analysis, statistical evaluation, and, if required, alternative source demonstration(s). Initiation of the Spring 2021 semiannual detection monitoring sampling and analysis event. Completion of the 2020-2021 Groundwater Monitoring and Corrective Action Report.

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 reports are included as **Appendix C**:

C.1 Groundwater Monitoring Alternative Source Demonstration Report April 2019 Groundwater Monitoring Event, Ash Impoundment, Iatan Generating Station (November 2019).

C.2 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2019 Groundwater Monitoring Event, Ash Impoundment, Iatan Generating Station (June 2020).

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.

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 Ash Impoundment. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map

LEGEND:

MW-109 MONITORING WELL

NOTES:

1. HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE (NAD 83)
2. VERTICAL DATUM: NAVD 88
3. GOOGLE EARTH IMAGE DATED JUNE 10, 2016.

400 0 400 800

SCALE FEET

REV.	DATE	CK. BY
0	-	-
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-

SHEET TITLE
SITE MAP
COAL ASH IMPOUNDMENT SYSTEM

PROJECT TITLE
2019-2020 GROUNDWATER MONITORING AND CORRECTIVE ACTIVE REPORT

CLIENT
EVERGY METRO, INC
IATAN GENERATING STATION
WESTON, MISSOURI

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	CHK. BY:	QA/A RVW BY:
27217413.20	MBJ	JRF	JRR
DSN. BY:			PROJ. MGR
JRR			JRF

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7/8/2020

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APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
Ash Impoundment
Appendix III and Appendix IV Detection Monitoring Results July 2019 - June 2020
Evergy Iatan Generating Station

Well Number	Sample Date	Appendix III Constituents							Appendix IV Constituents***														
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Fluoride (mg/L)	Lead (mg/L)	Lithium (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Selenium (mg/L)	Thallium (mg/L)	Radium Combined (pCi/L)
MW-101	11/04/19	<0.200	130	7.63	0.551	7.10	<5.00	504	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-101	01/16/20	---	---	*6.38	*0.380	**7.33	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-101	05/20/20	<0.200	130	5.89	0.350	6.93	<5.00	546	<0.00400	<0.00200	0.639	<0.00200	<0.00100	<0.0100	<0.0100	0.350	<0.00500	0.0362	<0.000200	<0.00500	<0.00200	<0.00200	6.661
MW-102	11/04/19	<0.200	126	5.06	0.254	7.15	<5.00	446	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-102	05/20/20	<0.200	125	5.37	0.267	6.99	<5.00	487	<0.00400	0.0186	0.602	<0.00200	<0.00100	<0.0100	<0.0100	0.267	<0.00500	0.0363	<0.000200	<0.00500	<0.00200	<0.00200	4.125
MW-103	11/04/19	<0.200	130	4.55	0.238	7.08	<5.00	455	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-103	05/20/20	<0.200	128	4.64	0.243	7.05	<5.00	482	<0.00400	<0.00200	0.658	<0.00200	<0.00100	<0.0100	<0.0100	0.243	<0.00500	0.0509	<0.000200	<0.00500	<0.00200	<0.00200	2.135
MW-104	11/04/19	1.19	56.5	24.2	0.518	7.65	130	418	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-104	01/16/20	---	*55.4	---	---	**7.64	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-104	02/04/20	---	*51.3	---	---	**7.65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-104	05/20/20	1.19	55.5	24.1	0.539	7.37	139	460	<0.00400	<0.00200	0.207	<0.00200	<0.00100	<0.0100	<0.0100	0.539	<0.00500	0.0215	<0.000200	0.0183	<0.00200	<0.00200	1.809
MW-105	11/04/19	1.77	76.4	20.2	0.799	7.33	299	688	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-105	01/16/20	---	---	*20.4	---	**7.49	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-105	02/04/20	---	---	*20.9	---	**7.44	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-105	05/20/20	1.66	74.1	16.4	0.707	7.12	302	795	<0.00400	<0.00200	0.308	<0.00200	<0.00100	<0.0100	<0.0100	0.707	<0.00500	0.0289	<0.000200	0.0338	<0.00200	<0.00200	0.169
MW-107	07/23/19	---	*54.8	*34.3	---	**7.93	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-107	11/04/19	2.10	57.5	31.3	0.683	7.51	221	577	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-107	01/16/20	---	---	*34.3	---	**7.62	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-107	02/04/20	---	---	*27.5	---	**7.65	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-107	05/20/20	0.876	40.3	17.0	0.533	7.40	174	475	<0.00400	<0.00200	0.0732	<0.00200	<0.00100	<0.0100	<0.0100	0.533	<0.00500	0.0162	<0.000200	0.0436	<0.00200	<0.00200	1.359
MW-108	11/04/19	1.35	129	18.4	0.492	7.34	308	760	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-108	05/20/20	1.60	117	20.8	0.509	7.15	359	813	<0.00400	<0.00200	0.110	<0.00200	<0.00100	<0.0100	<0.0100	0.509	<0.00500	0.0296	<0.000200	0.0107	<0.00200	<0.00200	0.0334
MW-109	11/04/19	0.709	123	20.4	0.477	7.24	253	712	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-109	05/20/20	1.35	92.2	25.6	0.525	7.19	296	691	<0.00400	<0.00200	0.187	<0.00200	<0.00100	<0.0100	<0.0100	0.525	<0.00500	0.0217	<0.000200	0.0246	<0.00200	<0.00200	1.193
MW-110	11/04/19	2.54	61.4	20.2	0.471	7.56	347	717	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-110	05/20/20	3.96	43.3	29.4	0.583	7.46	207	684	<0.00400	<0.00200	0.0887	<0.00200	<0.00100	<0.0100	<0.0100	0.583	<0.00500	<0.0150	<0.000200	0.184	<0.00200	<0.00200	1.411
MW-111	11/04/19	0.786	98.8	7.85	0.492	7.23	22.8	526	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-111	05/20/20	0.827	93.3	9.26	0.517	7.25	29.0	564	<0.00400	<0.00200	0.380	<0.00200	<0.00100	<0.0100	<0.0100	0.517	<0.00500	0.0246	<0.000200	0.0115	<0.00200	<0.00200	1.242

mg/L - miligrams per liter
pCi/L - picocuries per liter
S.U. - Standard Units
--- Not Sampled
* Verification Sample
** Extra Sample Collected per Standard Sampling Procedure
*** Not required for detection moniotoring. Collected for additioonal background data.

Table 2
Ash Impoundment
Detection Monitoring Field Measurements July 2019 - June 2020
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-101	11/04/19	7.10	915	14.51	0.0	-154	0.38	4.72	772.47
MW-101	01/16/20	**7.33	987	14.05	0.0	-138	0.00	6.11	771.08
MW-101	05/20/20	6.93	1010	15.03	0.0	-114	0.00	8.32	768.87
MW-102	11/04/19	7.15	856	13.14	0.0	-151	0.69	3.16	772.63
MW-102	05/20/20	6.99	937	14.50	0.0	-128	0.00	6.82	768.97
MW-103	11/04/19	7.08	826	14.17	0.0	-141	0.61	9.38	773.81
MW-103	05/20/20	7.05	807	16.15	0.0	-167	0.92	14.20	768.99
MW-104	11/04/19	7.65	785	15.30	0.5	-182	0.00	5.18	773.94
MW-104	01/16/20	**7.64	770	13.70	5.0	-155	0.00	7.72	771.40
MW-104	02/04/20	**7.65	749	12.16	2.9	-66	1.18	8.01	771.11
MW-104	05/20/20	7.37	702	15.25	9.2	-185	1.22	10.40	768.72
MW-105	11/04/19	7.33	1060	13.17	0.0	-133	0.81	6.19	773.96
MW-105	01/16/20	**7.49	1150	11.91	2.1	-135	0.00	9.35	770.80
MW-105	02/04/20	**7.44	1160	10.97	0.0	-109	0.79	9.71	770.44
MW-105	05/20/20	7.12	1250	14.33	0.0	-131	0.00	11.21	768.94
MW-107	07/23/19	**7.93	1040	16.40	0.0	-179	1.55	4.96	773.15
MW-107	11/04/19	7.51	1026	14.12	0.0	-147	0.56	6.00	772.11
MW-107	01/16/20	**7.62	959	12.02	2.4	-84	0.00	9.00	769.11
MW-107	02/04/20	**7.65	920	12.70	6.0	-70	0.00	9.19	768.92
MW-107	05/20/20	7.40	780	15.50	0.0	-146	0.00	9.85	768.26
MW-108	11/04/19	7.34	1290	11.35	0.0	-156	0.88	5.21	772.37
MW-108	05/20/20	7.15	1240	12.58	0.0	-164	0.00	9.42	768.16
MW-109	11/04/19	7.24	1100	14.49	0.0	-169	0.29	5.26	772.57
MW-109	05/20/20	7.19	1100	14.97	0.0	-163	0.00	9.87	767.96
MW-110	11/04/19	7.56	1060	12.65	2.4	-159	0.38	5.26	772.96
MW-110	05/20/20	7.46	1110	12.20	15.9	-167	0.00	9.98	768.24
MW-111	11/04/19	7.23	880	14.72	39.6	-170	0.31	5.87	772.89
MW-111	05/20/20	7.25	1040	15.08	0.0	-167	0.00	10.66	768.10

* Verification Sample
** Extra Sample Collected 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

ALTERNATIVE SOURCE DEMONSTRATION

C.1 Groundwater Monitoring Alternative Source Demonstration Report April 2019 Groundwater Monitoring Event, Ash Impoundment, Iatan Generating Station (November 2019)

C.2. CCR Groundwater Monitoring Alternative Source Demonstration Report November 2019 Groundwater Monitoring Event, Ash Impoundment, Iatan Generating Station (June 2020)

C.1 Groundwater Monitoring Alternative Source Demonstration Report April 2019 Groundwater Monitoring Event, Ash Impoundment, Iatan Generating Station (November 2019)

GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
APRIL 2019 GROUNDWATER MONITORING EVENT

ASH IMPOUNDMENT
IATAN GENERATING STATION
PLATTE COUNTY, MISSOURI

Presented To:

Evergy Metro, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

November 2019

File No. 27213167.19

Public

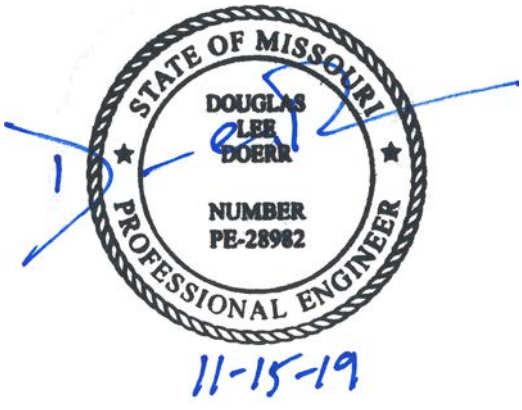
CERTIFICATIONS

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 Ash Impoundment 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 Ash Impoundment 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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Appendices

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 Ash Impoundment at the Iatan Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated April 16, 2019. The initial detection monitoring sampling event was scheduled for March 2019; however, the historic flooding of the Missouri River in March prevented the sampling event until flood waters receded and the sampling event was performed April 29, 2019. Review and validation of the results from the April 2019 Detection Monitoring Event was completed on June 27, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A 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 May 20, 2019 and July 23, 2019. The second verification sample was not collected until July because of additional flooding in June 2019.

The completed statistical evaluation identified one Appendix III constituent above its respective prediction limit. The prediction limit for chloride in monitoring well MW-107 is 25.9 mg/L. The detection monitoring sample was reported at 33.3 mg/L. The first verification re-sample was collected on May 20, 2019 with a result of 34.2 mg/L. The second verification re-sample was collected on July 23, 2019 with a result of 34.3 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for chloride from monitoring well MW-107 exceeds its prediction limit and is a confirmed statistically significant increase (SSI) over background.

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified an SSI above the background prediction limit for chloride in monitoring well MW-107.

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 Ash Impoundment at the Iatan Generating Station, there are multiple lines of supporting evidence to indicate the above SSI was not caused by a release from the Ash Impoundment. 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.

Although an SSI was only identified in monitoring well MW-107, box and whiskers plots for chloride were prepared for monitoring wells MW-107 and MW-109, the collector well, and a stormwater sample to allow comparison of the concentrations. The comparison between wells indicates the chloride concentrations are similar between the three wells and stormwater with greater variability in MW-107 than MW-109 and a concentration in the stormwater nearly as high as the highest level in MW-107. The samples collected that exceed the prediction limit for chloride were all collected shortly after significant flooding and inundation of the well. This demonstrates that a source other than the Ash Impoundment could have caused the SSI over background levels, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots are provided in **Appendix A**.

3.2 REPRESENTATIVENESS OF BACKGROUND

Representativeness is defined as the level of how well or how accurately a sample set reflects actual or natural conditions. If the upper and lower prediction limits for the background concentration of chloride for MW-107 represents the entire population of historical concentrations of chloride for MW-107 under all natural conditions, including low river stages, high river stages, flooding, drought, etc., the background data set would have good representativeness. However, due to the inherent constraints of the CCR Final Rule, and the limited number of background data points over a limited period of time, the background data set for chloride for MW-107 does not exhibit good representativeness. The background data set does not include data collected under the full spectrum of natural conditions such as those experienced

during and after the historic Missouri River flooding in the spring and fall of 2019 in which MW-107 was inundated three times during parts of March-April, May-June, and September-October. A hydrograph of the Missouri River stage at St. Joseph, Missouri, showing the river stage during the time period in which background data was collected and the time period when compliance data points were collected is provided in **Appendix B**. The upper and lower prediction limits for chloride in MW-107 were calculated from eight data points between February 28, 2018 and February 15, 2019 and is not believed to be representative of the entire population of chloride concentrations in MW-107 under naturally occurring conditions, such as flooding. This demonstrates that a source other than the Ash Impoundment could have caused the SSI over background levels, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.3 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-107 and leachate from the nearby ash landfill is provided in **Appendix C** and indicates the groundwater from this well does not exhibit the same geochemical characteristics as the leachate. The groundwater plots in a different area than the leachate indicating the waters are different. This demonstrates that a source other than the Ash Impoundment caused the SSI over background levels for chloride or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

4 CONCLUSION

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

5 GENERAL COMMENTS

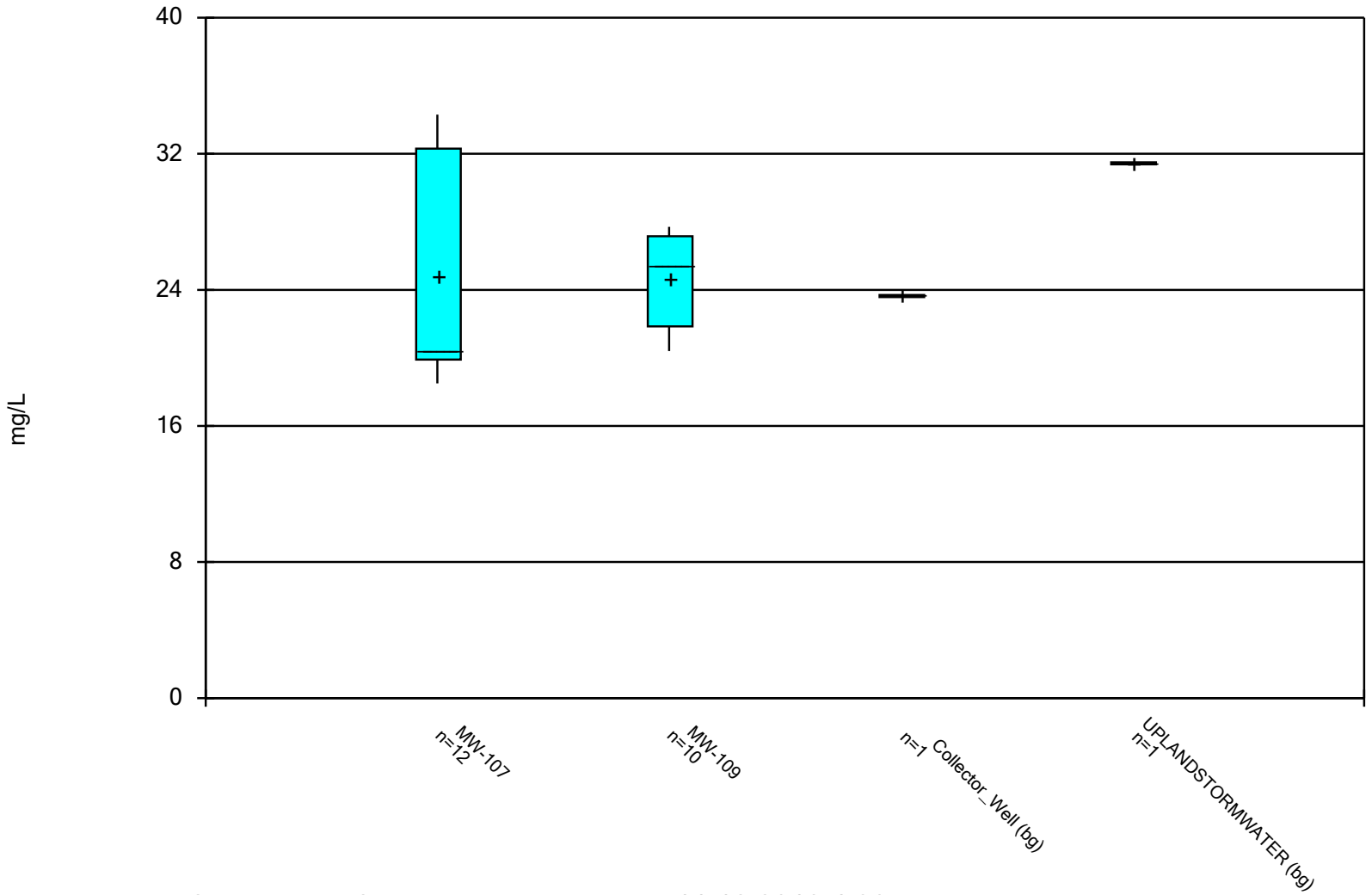
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. 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: Chloride Analysis Run 11/12/2019 4:30 PM View: Ash Impound III

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

Box & Whiskers Plot

Constituent: Chloride (mg/L) Analysis Run 11/12/2019 4:31 PM View: Ash Impound III

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

	MW-107	MW-109	Collector_Wel...	UPLANDSTORMWA...
6/17/2016			23.7	
2/27/2018		25.2		
2/28/2018	18.5			
4/16/2018	19.7	23.1		
5/21/2018	20.6	25.7		
7/19/2018	20.1	27.7		
9/10/2018		27.2		
9/11/2018	19			
10/29/2018	20.2	27.1		
12/19/2018		26.5		
12/20/2018	20.2			
2/15/2019	25.9	21.2		
4/29/2019	33.3	22.5		
5/20/2019	34.2			
7/23/2019	34.3			
11/4/2019	31.3	20.4		31.5
Median	20.4	25.45	23.7	31.5
LowerQ.	19.9	21.85	23.7	31.5
UpperQ.	32.3	27.15	23.7	31.5
Min	18.5	20.4	23.7	31.5
Max	34.3	27.7	23.7	31.5
Mean	24.78	24.66	23.7	31.5

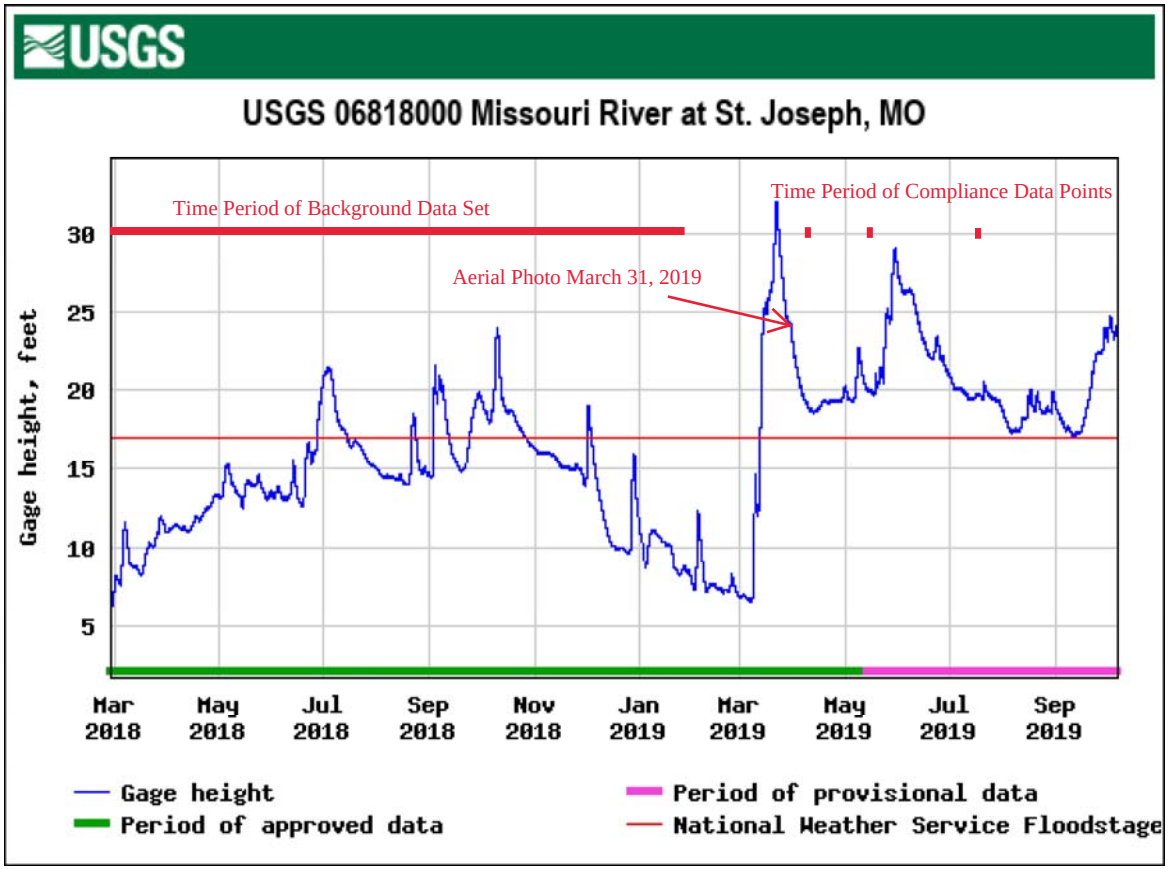
Box & Whiskers Plot

Iatan Utility Waste LF Client: SCS Engineers Data: Iatan jrr Printed 11/12/2019, 4:31 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Chloride (mg/L)	MW-107	12	24.78	6.576	1.898	20.4	18.5	34.3	0
Chloride (mg/L)	MW-109	10	24.66	2.659	0.8408	25.45	20.4	27.7	0
Chloride (mg/L)	Collector...	1	23.7	0	0	23.7	23.7	23.7	0
Chloride (mg/L)	UPLANDSTO...	1	31.5	0	0	31.5	31.5	31.5	0

Appendix B

Missouri River Stage Hydrograph

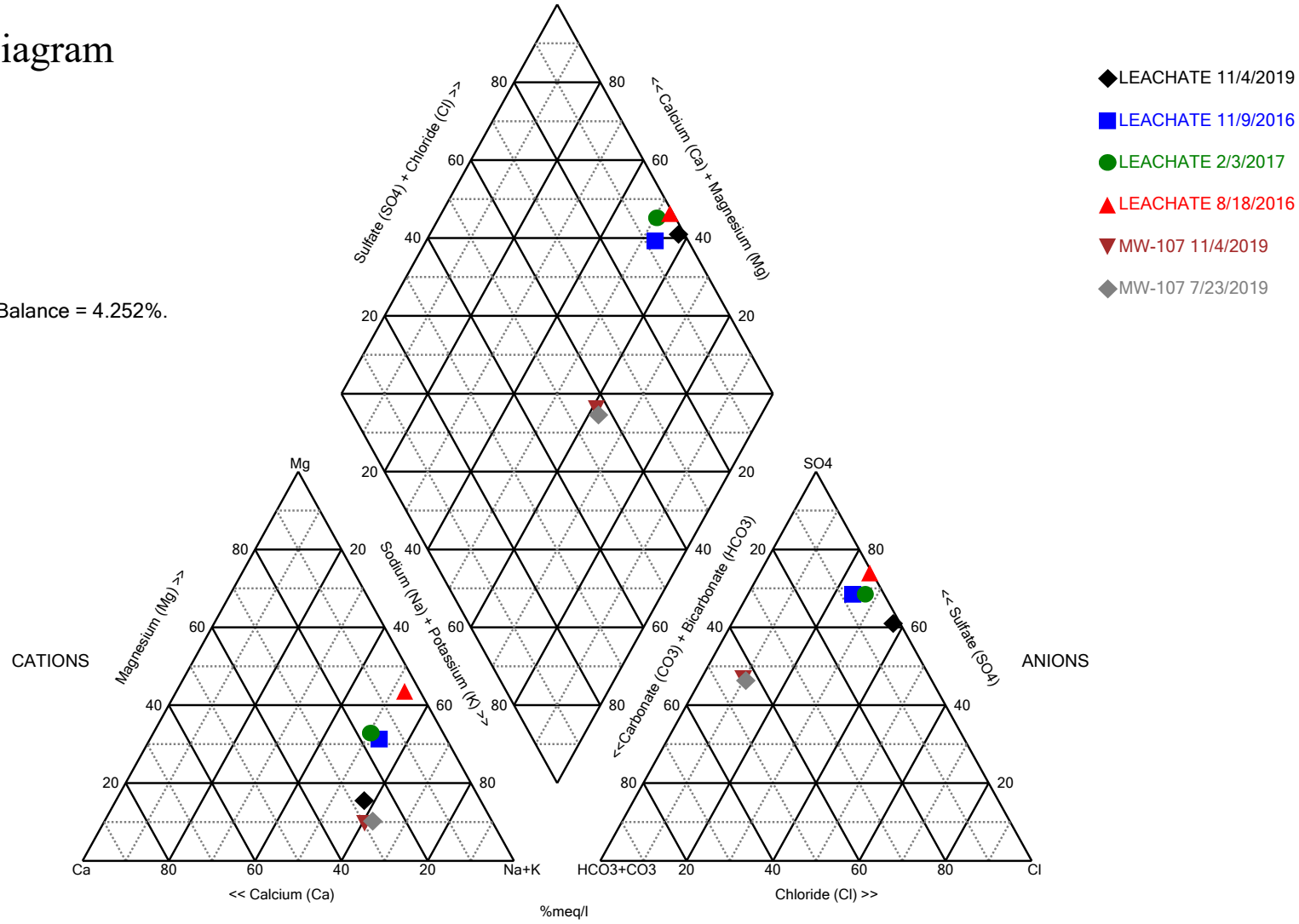

USGS
USGS 06818000 Missouri River at St. Joseph, MO
Time Period of Background Data Set
Time Period of Compliance Data Points
Aerial Photo March 31, 2019
Gage height, feet
30
25
20
15
10
5
Mar 2018
May 2018
Jul 2018
Sep 2018
Nov 2018
Jan 2019
Mar 2019
May 2019
Jul 2019
Sep 2019
Gage height
Period of approved data
Period of provisional data
National Weather Service Floodstage

Appendix C

Piper Diagram

Piper Diagram

Cation-Anion Balance = 4.252%.



Analysis Run 11/12/2019 4:46 PM View: Ash Impound III

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

Piper Diagram

Analysis Run 11/12/2019 4:47 PM View: Ash Impound III

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

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
LEACHATE 8/18/2016	9250	689	573	4240	6990	28000	644	20
LEACHATE 11/9/2016	1230	90.7	334	398	876	3460	480	20
LEACHATE 2/3/2017	1880	121	560	671	1760	6070	505	20
LEACHATE 11/4/2019	1110	51.7	460	163	2340	5230	206	20
MW-107 7/23/2019	139	7.31	54.8	12	34.3	220	227	20
MW-107 11/4/2019	131	7.13	57.5	10.9	31.3	221	223	20

C.2. CCR Groundwater Monitoring Alternative Source Demonstration Report November 2019 Groundwater Monitoring Event, Ash Impoundment, Iatan Generating Station (June 2020)

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
NOVEMBER 2019 GROUNDWATER MONITORING EVENT

ASH IMPOUNDMENT
IATAN GENERATING STATION
PLATTE COUNTY, MISSOURI

Presented To:

Evergy Metro, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

June 2020

File No. 27213167.20

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 Ash Impoundment 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.

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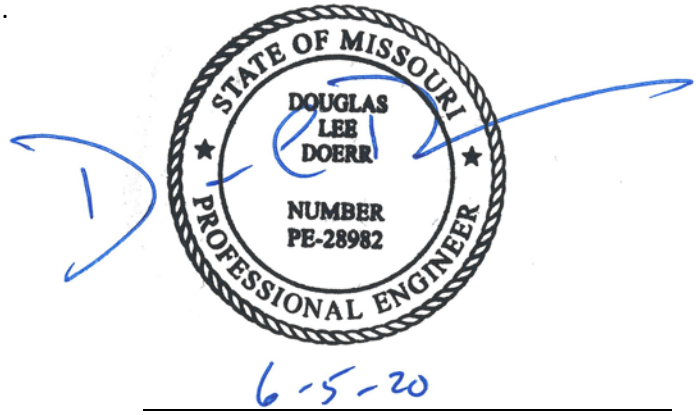

Douglas L. Doerr, P.E.

SCS Engineers

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1 REGULATORY FRAMEWORK

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2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the Ash Impoundment at the Iatan Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated April 16, 2019. Groundwater samples were collected on November 4, 2019. Review and validation of the results from the November 2019 Detection Monitoring Event was completed on December 12, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A 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 January 16, 2020 and February 4, 2020.

The completed statistical evaluation identified one Appendix III constituent above the prediction limit established for monitoring wells MW-105 and MW-107.

Constituent/Monitoring Well	*UPL	Observation November 4, 2019	1st Verification January 16, 2020	2nd Verification February 4, 2020
Chloride				
MW-105	19.3	20.2	20.4	20.9
MW-107	25.9	31.3	34.3	27.5

*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 an SSI above the background prediction limit for chloride in monitoring wells MW-105 and MW-107.

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 Ash Impoundment at the Iatan Generating Station, there are multiple lines of supporting evidence to indicate the above SSI was not caused by a release from the Ash Impoundment. 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.

Chloride SSIs were identified in monitoring wells MW-105 and MW-107. Box and whiskers plots for chloride were prepared for monitoring wells MW-105 and MW-107, collector well, and a stormwater sample to allow comparison of the concentrations. The comparison between wells indicates the chloride concentrations are a little higher with more variability in MW-107. The chloride concentration in the collector well is higher than MW-105 and about equal to the average concentration in MW-107. The chloride concentration in the stormwater sample is higher than any of the concentrations in MW-105 and similar to the post-flooding concentrations in MW-107. The samples collected that exceed the prediction limit for chloride were collected shortly after significant flooding and inundation of the wells. The flooding and well inundation likely affected the groundwater in the some of the wells. This demonstrates that a source other than the Ash Impoundment could have caused the SSIs over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots are provided in **Appendix A**.

3.2 REPRESENTATIVENESS OF BACKGROUND

Representativeness is defined as the level of how well or how accurately a sample set reflects actual or natural conditions. If the upper and lower prediction limits for the background concentration of chloride for MW-105 and MW-107 represents the entire population of historical concentrations of chloride for MW-105 and MW-107 under all natural conditions, including low river stages, high river stages, flooding, drought, etc., the background data set would have good representativeness. However, due to the inherent constraints of the CCR Final Rule, and the limited number of background data points over a limited period of time, the background data set for chloride for MW-105 and MW-107 does not exhibit good representativeness. The background data set does not include data collected under the full spectrum of natural conditions such as those experienced during and after the historic Missouri River flooding in the spring and fall of 2019 in which MW-105 and MW-107 were inundated three times during parts of March-April, May-June, and September-October. A hydrograph of the Missouri River stage at St.

Joseph, Missouri, showing the river stage during the time period in which background data was collected and the time period when compliance data points were collected is provided in **Appendix B**. The upper and lower prediction limits for chloride in MW-105 and MW-107 were calculated from eight data points between February 28, 2018 and February 15, 2019 and are not believed to be representative of the entire population of chloride concentrations in MW-105 and MW-107 under naturally occurring conditions, such as during and following flooding. This demonstrates that a source other than the Ash Impoundment could have caused the SSIs over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.3 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-105, MW-107 and leachate from the nearby ash landfill is provided along with analytical results in **Appendix C** and indicates the groundwater from this well does not exhibit the same geochemical characteristics as the leachate. The groundwater plots in a different area than the leachate indicating the waters are different. This demonstrates that a source other than the Ash Impoundment could have caused the SSIs over background levels for chloride or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.4 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.

Time series plots for chloride were prepared for monitoring wells MW-105 and MW-107 and a stormwater sample to allow comparison of the concentrations. The comparison between wells indicates MW-107 responded to the flooding with an increase of chloride concentrations and the MW-105 response was delayed and subdued relative to MW-107. Additionally, the chloride concentration in the stormwater

sample is higher than any of the concentrations in MW-105 and similar to the post-flooding concentrations in MW-107. The samples collected that exceed the prediction limit for chloride were collected shortly after significant flooding and inundation of the wells. This demonstrates that a source other than the Ash Impoundment could have caused the SSIs over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or 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 Ash Impoundment caused the SSI over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Based on the successful ASD, the owner or operator of the Ash Impoundment may continue with the detection monitoring program under § 257.94.

5 GENERAL COMMENTS

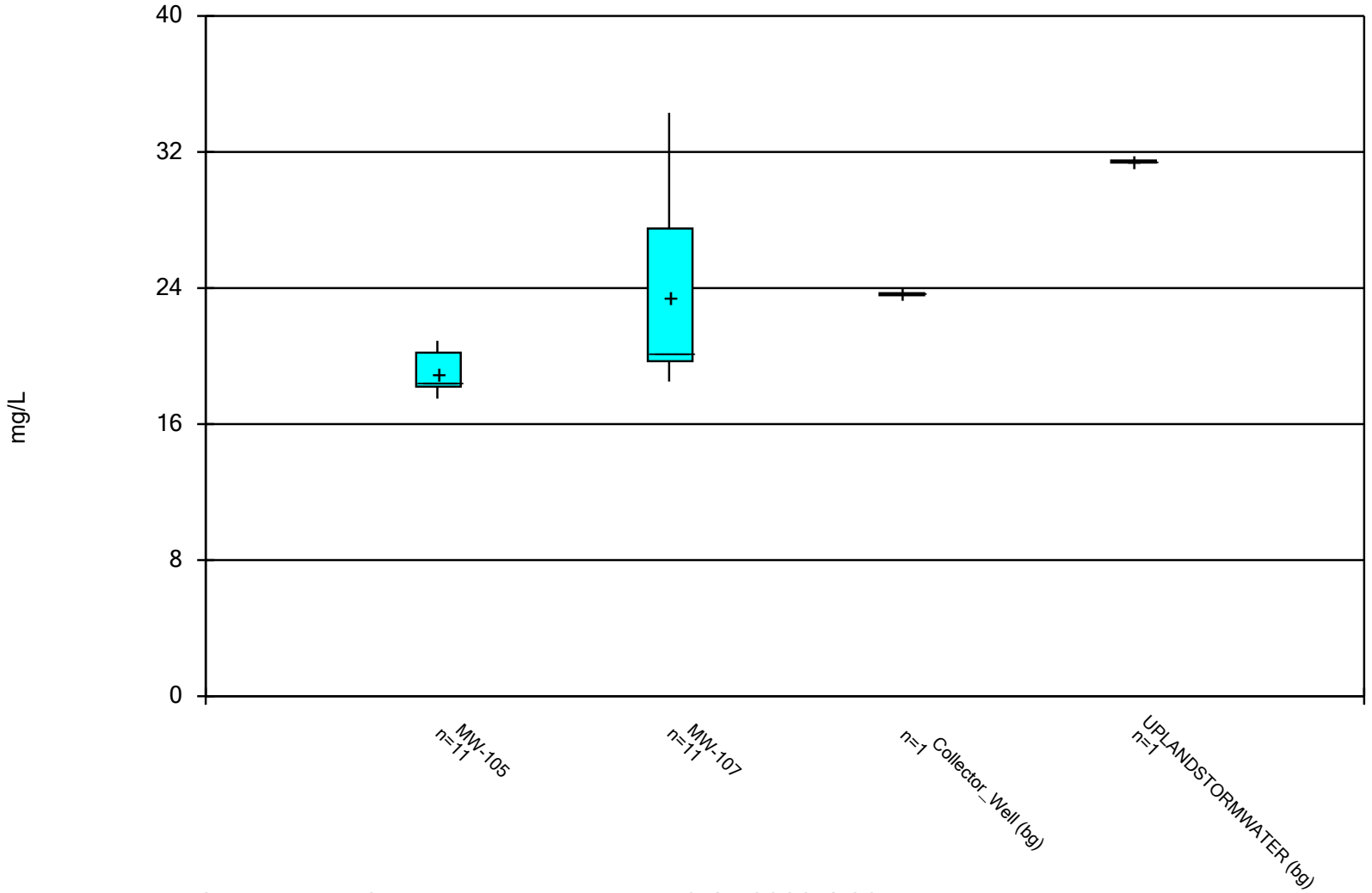
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. 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: Chloride Analysis Run 3/17/2020 4:26 PM View: Ash Impound III

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

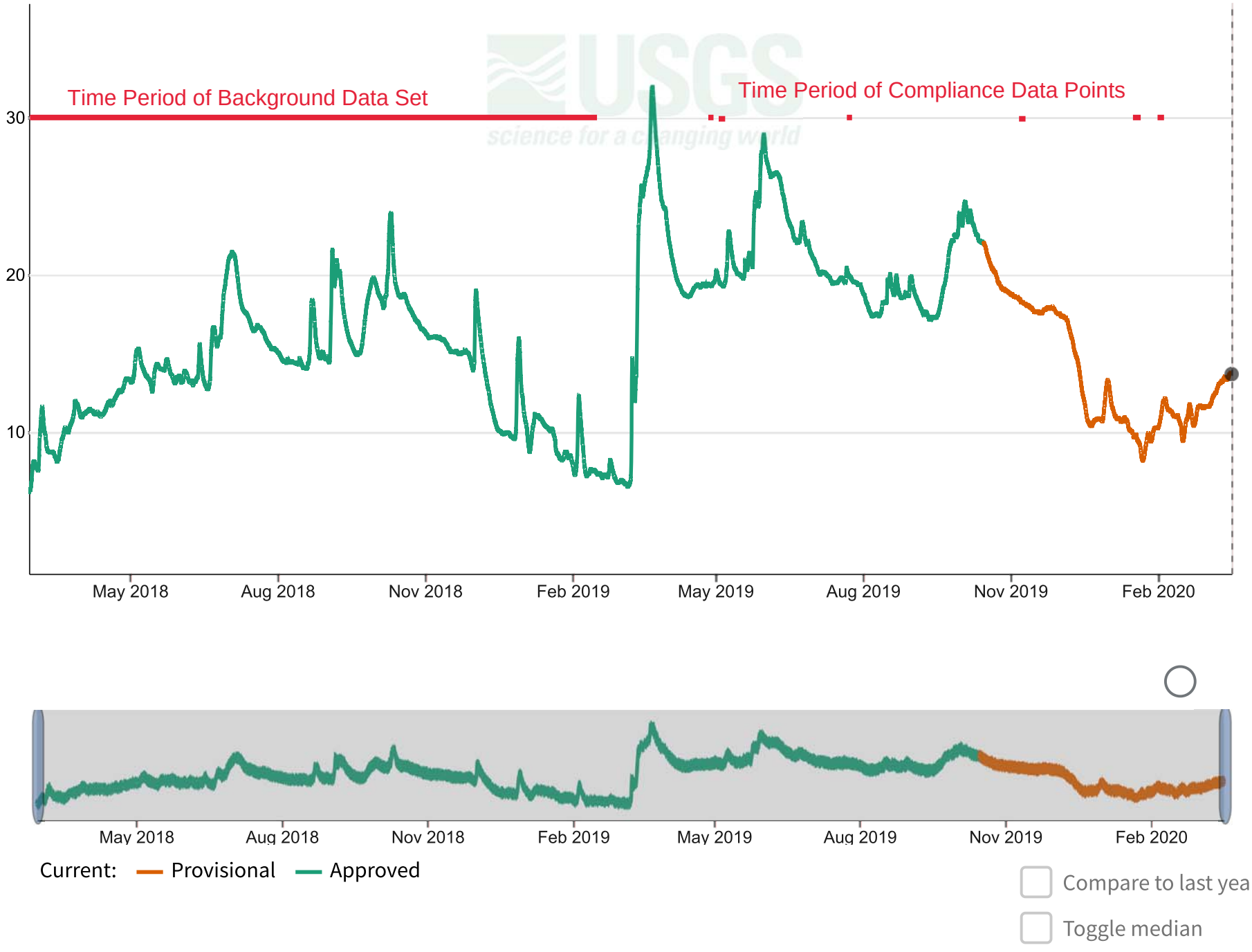
Box & Whiskers Plot

Iatan Utility Waste LF Client: SCS Engineers Data: Iatan jrr Printed 3/17/2020, 4:28 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Chloride (mg/L)	MW-105	11	18.9	1.107	0.3338	18.5	17.5	20.9	0
Chloride (mg/L)	MW-107	11	23.39	5.482	1.653	20.2	18.5	34.3	0
Chloride (mg/L)	Collector...	1	23.7	0	0	23.7	23.7	23.7	0
Chloride (mg/L)	UPLANDSTO...	1	31.5	0	0	31.5	31.5	31.5	0

Appendix B

Missouri River Stage Hydrograph

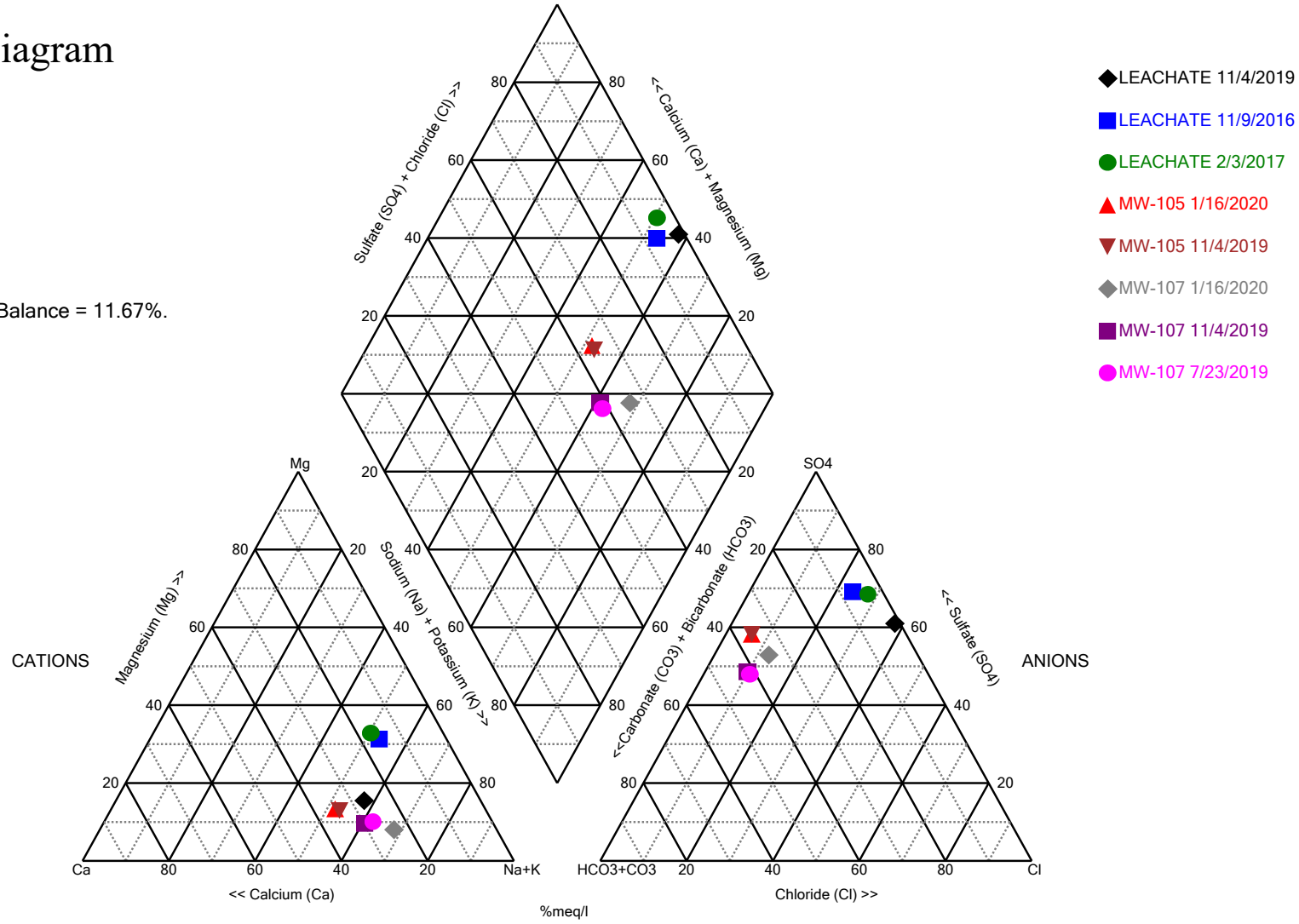

Time Period of Background Data Set
Time Period of Compliance Data Points
30
20
10
May 2018
Aug 2018
Nov 2018
Feb 2019
May 2019
Aug 2019
Nov 2019
Feb 2020
Current:
Provisional
Approved
Compare to last year
Toggle median

Appendix C

Piper Diagram Plots and Analytical Results

Piper Diagram

Cation-Anion Balance = 11.67%.



Analysis Run 3/17/2020 4:34 PM View: Ash Impound III

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

Piper Diagram

Analysis Run 3/17/2020 4:36 PM View: Ash Impound III

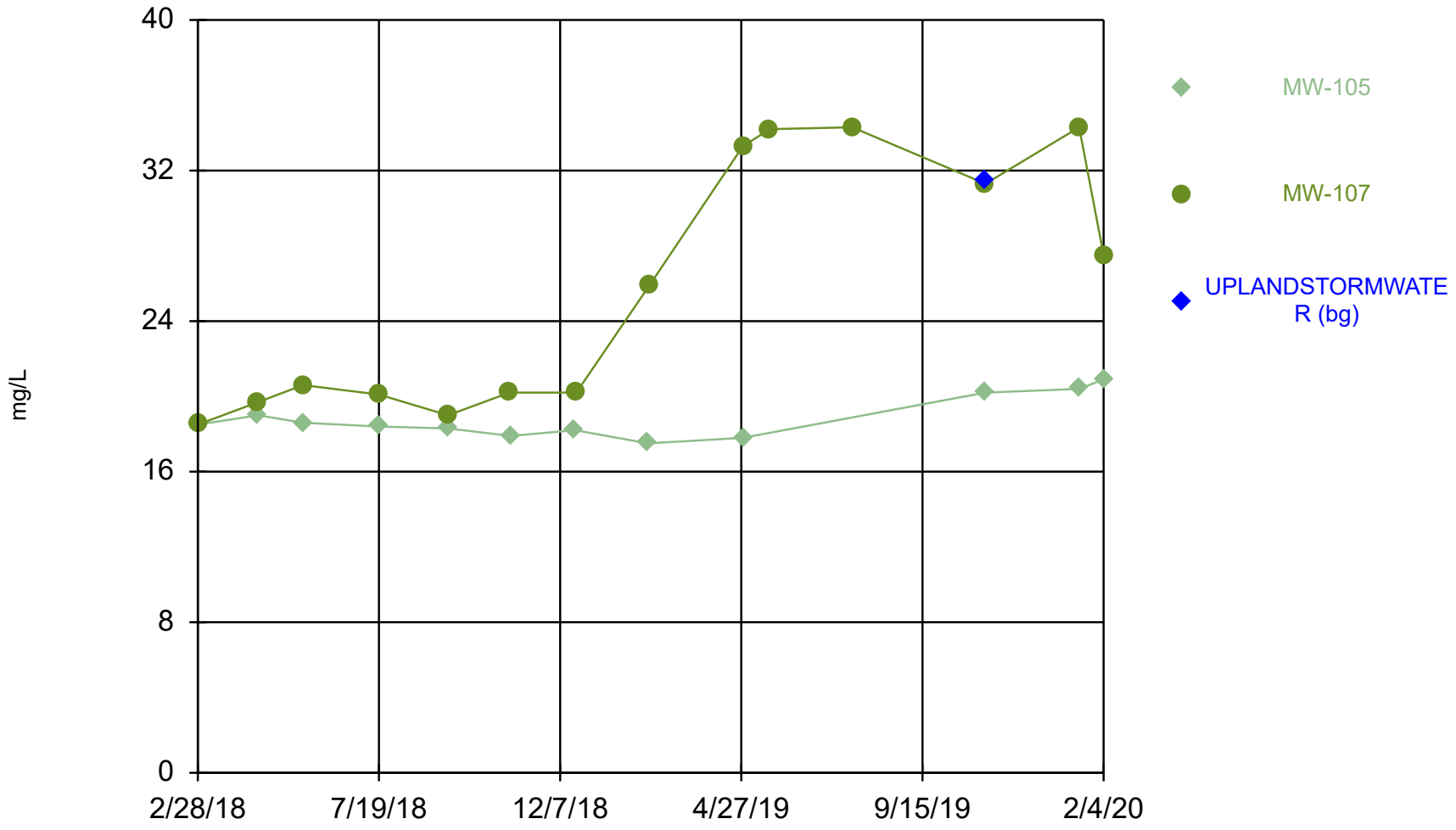
Iatan Utility Waste LF Client: SCS Engineers Data: Iatan jrr

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
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
MW-105 11/4/2019	134	4.71	76.4	16.9	20.2	299	218	10
MW-105 1/16/2020	130	4.53	77.9	18.1	20.4	308	226	10
MW-107 7/23/2019	139	7.31	54.8	12	34.3	220	227	10
MW-107 11/4/2019	131	7.13	57.5	10.9	31.3	221	223	10
MW-107 1/16/2020	122	5.81	38.3	7.69	34.3	206	154	10

Appendix D

Time Series Plots

Time Series



Constituent: Chloride Analysis Run 3/18/2020 3:05 PM View: Ash Impound III

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

Time Series

Constituent: Chloride (mg/L) Analysis Run 3/18/2020 3:06 PM View: Ash Impound III

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

	MW-105	MW-107	UPLANDSTORMWA...
2/28/2018	18.5	18.5	
4/16/2018	19	19.7	
5/21/2018	18.6	20.6	
7/19/2018	18.4	20.1	
9/11/2018	18.3	19	
10/29/2018		20.2	
10/30/2018	17.9		
12/19/2018	18.2		
12/20/2018		20.2	
2/14/2019	17.5		
2/15/2019		25.9	
4/29/2019	17.8	33.3	
5/20/2019		34.2	
7/23/2019		34.3	
11/4/2019	20.2	31.3	31.5
1/16/2020	20.4	34.3	
2/4/2020	20.9	27.5	