

# 2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

## CCR LANDFILL AND LOWER AQC IMPOUNDMENT LA CYGNE GENERATING STATION LA CYGNE, KANSAS

Presented To:  
Energys Metro, Inc.

**SCS ENGINEERS**

27217233.20 | January 2021

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## CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Professional Geologist in the State of Kansas, do hereby certify that the 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



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John R. Rockhold, P.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Kansas, do hereby certify that the 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



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Douglas L. Doerr, P.E.

SCS Engineers

# 2020 Groundwater Monitoring and Corrective Action Report

Revision Number	Revision Date	Revision Section	Summary of Revisions

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# 1 INTRODUCTION

This 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), 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 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne 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, 2020), the CCR Landfill and Lower AQC Impoundment were 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, 2020), the CCR Landfill and Lower AQC Impoundment were 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
Spring 2020	MW-14R	Chloride	Successful
Spring 2020	MW-14R	Fluoride	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 Lower AQC Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR Landfill and Lower AQC 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 CCR Landfill and Lower AQC Impoundment in 2020.

### 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 (2020). Samples collected in 2020 were collected and analyzed for Appendix III detection monitoring constituents. Additionally, Appendix IV constituents were analyzed with the spring event for potential future updating of background data in conformance with EPA Unified Guidance and industry standards. Results of the sampling events are provided in **Appendix B, Table 1** (Appendix III with Supplemental Appendix IV Detection Monitoring Results), and **Table 2** (Detection Monitoring Field Measurements). These tables include Spring 2020 semiannual detection monitoring data, verification sample data, and supplementary Appendix IV sample

data; and, the initial Fall 2020 semiannual detection monitoring data. The dates of sample collection and the monitoring program requiring the sample 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 2020. Only detection monitoring was conducted in 2020.

### 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 statistical evaluation of the Fall 2019 semiannual detection monitoring sampling and analysis event per the certified statistical method,
- b. completion of the 2019 Annual Groundwater Monitoring and Corrective Action Report,
- c. completion of the Spring 2020 semiannual detection monitoring sampling and analysis event with subsequent verification sampling per the certified statistical method, and supplemental Appendix IV sample analysis,
- d. completion of the statistical evaluation of the Spring 2020 semiannual detection monitoring sampling and analysis event per the certified statistical method,
- e. completion of a successful alternative source demonstration for the Spring 2020 semiannual detection monitoring sampling and analysis event, and
- f. initiation of the Fall 2020 semiannual detection monitoring sampling and analysis event.

*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 (2021).*

Completion of verification sampling and data analysis, and the statistical evaluation of Fall 2020 detection monitoring sampling and analysis event. Semiannual Spring and Fall 2020 groundwater sampling and analysis. Completion of the statistical evaluation of the Spring 2020 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 report is included as **Appendix C**:

- C.1 Groundwater Monitoring Alternative Source Demonstration Report May 2020 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (December 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.

## 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 La Cygne 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 La Cygne Generating Station CCR Landfill and Lower AQC Impoundment. No warranties, express or implied, are intended or made.

## APPENDIX A

### FIGURES



#### Figure 1: Site Map



N:\KCP\Projects\Groundwater\DWG\La Cygne\CCR Annual Report\2020\La Cygne LF LAQC Imp & UAQC Fig 1\_NOVEMBER 2020 - COMBINED.dwg Jan 15, 2021 - 11:33am Layout Name: Fig 1 Lower By: 4415alr



**LEGEND**

-  CCR UNIT BOUNDARY  
(APPROXIMATE LIMITS OF LOWER AQC IMPOUNDMENT)
-  MW-703 CCR GROUNDWATER MONITORING SYSTEM WELLS

**NOTES:**

1. KDHE FACILITY PERMIT AND LANDFILL PERMIT BOUNDARIES VARY FROM THAT SHOWN.
2. GOOGLE EARTH IMAGE DATED MARCH 2020. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.



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	△	-		-	-
SHEET TITLE			SITE MAP		
CCR LANDFILL & LOWER AQC IMPOUNDMENT			CCR GROUNDWATER MONITORING SYSTEM		
PROJECT TITLE			2020 CCR GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT		
CLIENT					
EVERGY METRO, INC LA CYGNE GENERATING STATION LA CYGNE, KANSAS					
SCS ENGINEERS					
8275 W. 110th St. Ste. 100 Overland Park, Kansas 66210 PH. (913) 681-0630 FAX. (913) 681-0012					
PROJ. NO. 27217233.20	DWN. BY. ALR	CHK. BY. JF	D/A R/W BY. JRR	PROJ. MGR. JRR	
CADD FILE: LA CYGNE LF LAQC Imp & UAQC Fig 1_NOVEMBER 2020 - COMBINED.dwg					
DATE: 1/15/21					
FIGURE NO. <b>1</b>					

## APPENDIX B

### TABLES

Table 1: Appendix III with Supplemental Appendix IV Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements



**Table 1**  
**CCR Landfill and Lower AQC Impoundment**  
**Appendix III with Supplemental Appendix IV Detection Monitoring Results**  
**Evergy LaCygne 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-10	5/19/2020	0.791	52.1	51.8	0.422	7.34	14.4	584	<0.00400	0.0115	0.320	<0.00200	<0.00100	<0.0100	<0.0100	0.422	<0.00500	0.0306	<0.000200	<0.00500	<0.00200	<0.00200	0.425
MW-10	11/12/2020	0.845	52.5	51.5	0.375	7.34	9.92	571	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	5/19/2020	0.324	382	19.5	0.169	6.81	1700	2710	<0.00400	<0.00200	0.0166	<0.00200	<0.00100	<0.0100	<0.0100	0.169	<0.00500	0.0500	<0.000200	<0.00500	<0.00200	<0.00200	2.25
MW-13	7/13/2020	---	---	*18.8	---	**6.88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	11/12/2020	0.456	331	17.1	0.165	6.62	1500	2420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14R	5/19/2020	0.688	53.9	6.21	0.329	7.35	60.5	579	<0.00400	<0.00200	0.0423	<0.00200	<0.00100	<0.0100	<0.0100	0.329	<0.00500	0.0385	<0.000200	<0.00500	<0.00200	<0.00200	0.945
MW-14R	7/13/2020	---	---	*6.38	*0.336	**7.54	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14R	8/27/2020	---	---	*6.25	*0.312	**7.07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14R	11/12/2020	0.805	52.7	6.69	0.316	7.01	61.6	555	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-15	5/19/2020	0.209	99.3	10.8	0.284	7.25	182	734	<0.00400	<0.00200	0.0425	<0.00200	<0.00100	<0.0100	<0.0100	0.284	<0.00500	0.0210	<0.000200	<0.00500	<0.00200	<0.00200	1.74
MW-15	11/12/2020	0.235	102	10.8	0.248	6.95	191	713	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-601	5/19/2020	1.80	17.1	161	1.72	7.63	6.07	986	<0.00400	<0.00200	0.136	<0.00200	0.00146	<0.0100	<0.0100	1.72	<0.00500	0.0598	<0.000200	<0.00500	<0.00200	<0.00200	0.329
MW-601	11/12/2020	1.82	17.7	172	1.67	7.29	8.78	960	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-602	5/19/2020	2.28	23.8	17.1	1.24	7.60	25.7	611	<0.00400	<0.00200	0.105	<0.00200	<0.00100	<0.0100	<0.0100	1.24	<0.00500	0.0523	<0.000200	<0.00500	<0.00200	<0.00200	0
MW-602	11/12/2020	2.29	23.4	17.7	1.25	7.13	28.1	593	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-801	5/19/2020	2.14	26.2	91.4	1.09	7.52	<5.00	860	<0.00400	<0.00200	0.509	<0.00200	<0.00100	<0.0100	<0.0100	1.09	0.00779	0.0842	<0.000200	0.00974	<0.00200	<0.00200	0.632
MW-801	11/12/2020	2.20	26.4	95.2	1.05	7.65	3.25	832	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-802	5/19/2020	2.41	27.8	36.2	1.07	7.44	<5.00	685	<0.00400	<0.00200	0.939	<0.00200	<0.00100	<0.0100	<0.0100	1.07	<0.00500	0.0850	<0.000200	<0.00500	<0.00200	<0.00200	0.881
MW-802	11/12/2020	2.45	27.1	34.5	1.02	7.96	<5.00	646	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-803	5/19/2020	2.03	38.7	49.8	0.647	7.41	25.2	603	<0.00400	<0.00200	0.231	<0.00200	<0.00100	<0.0100	<0.0100	0.647	<0.00500	0.0672	<0.000200	0.00500	<0.00200	<0.00200	0.758
MW-803	11/12/2020	2.08	38.4	49.6	0.568	7.95	25.2	593	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-804	5/19/2020	1.56	66.7	29.1	0.489	7.28	25.2	553	<0.00400	<0.00200	0.147	<0.00200	<0.00100	<0.0100	<0.0100	0.489	<0.00500	0.0342	<0.000200	<0.00500	<0.00200	<0.00200	0.304
MW-804	11/12/2020	1.58	66.2	26.7	0.401	7.38	24.4	528	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-805	5/19/2020	0.503	450	472	0.176	6.52	713	2220	<0.00400	<0.00200	0.0350	<0.00200	<0.00100	<0.0100	<0.0100	0.176	<0.00500	0.0240	<0.000200	<0.00500	<0.00200	<0.00200	1.24
MW-805	11/12/2020	0.495	464	454	0.129	6.42	736	2210	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

\* 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

**Table 2**  
**CCR Landfill and Lower AQC Impoundment**  
**Detection Monitoring Field Measurements**  
**Evergy La Cygne 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-10	5/19/2020	7.34	983	15.81	3.10	-113	0.00	2.12	872.83
MW-10	11/12/2020	7.34	993	15.40	0.00	-61	0.61	3.82	871.13
MW-13	5/19/2020	6.81	2790	15.32	0.00	101	0.00	3.81	873.41
MW-13	7/13/2020	**6.88	2850	17.81	0.00	25	2.04	5.90	871.32
MW-13	11/12/2020	6.62	2830	15.73	0.00	142	3.06	6.98	870.24
MW-14R	5/19/2020	7.35	930	15.64	2.70	-64	0.00	7.62	871.21
MW-14R	7/13/2020	**7.54	983	18.58	0.00	-126	0.54	8.46	870.37
MW-14R	8/27/2020	**7.07	973	20.18	0.00	-135	2.88	8.76	870.07
MW-14R	11/12/2020	7.01	1020	15.86	0.00	-113	5.40	10.44	868.39
MW-15	5/19/2020	7.25	1120	17.16	0.50	109	0.00	8.95	864.93
MW-15	11/12/2020	6.95	1230	17.15	0.00	23	3.96	9.35	864.53
MW-601	5/19/2020	7.63	1650	14.57	10.50	30	0.00	9.90	869.28
MW-601	11/12/2020	7.29	1750	15.22	7.30	5	3.07	11.79	867.39
MW-602	5/19/2020	7.60	972	16.75	12.10	13	0.00	3.58	876.31
MW-602	11/12/2020	7.13	1050	15.78	0.00	56	8.81	4.85	875.04
MW-801	5/19/2020	7.52	1400	18.01	6.50	-82	0.00	1.25	856.40
MW-801	11/12/2020	7.65	1330	14.74	0.00	113	0.00	1.59	856.06
MW-802	5/19/2020	7.44	1130	18.53	0.00	-106	7.81	0.38	853.09
MW-802	11/12/2020	7.96	1070	14.57	0.00	137	0.00	0.00	853.47
MW-803	5/19/2020	7.41	1090	17.33	0.00	-12	0.00	7.77	847.23
MW-803	11/12/2020	7.95	962	14.99	0.00	142	0.00	9.64	845.36
MW-804	5/19/2020	7.28	981	19.11	0.00	12	0.90	10.64	844.56
MW-804	11/12/2020	7.38	874	17.98	0.00	139	0.00	8.05	847.15
MW-805	5/19/2020	6.52	3160	17.49	9.70	440	0.00	5.48	849.15
MW-805	11/12/2020	6.42	2770	16.80	16.80	146	0.00	5.51	849.12

\* 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

\*\*\*Depth to water measured in all monitoring wells within 24 hour period prior to the sampling event

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

Groundwater Monitoring Alternative Source Demonstration  
Report May 2020 Groundwater Monitoring Event, CCR Landfill  
and Lower AQC Impoundment, La Cygne Generating Station  
(December 2020)

C.1 Groundwater Monitoring Alternative Source Demonstration  
Report May 2020 Groundwater Monitoring Event, CCR Landfill  
and Lower AQC Impoundment, La Cygne Generating Station  
(December 2020)

**CCR GROUNDWATER MONITORING  
ALTERNATIVE SOURCE DEMONSTRATION REPORT  
MAY 2020 GROUNDWATER MONITORING EVENT**

**CCR LANDFILL AND LOWER AQC IMPOUNDMENT  
LA CYGNE GENERATING STATION  
LA CYGNE, KANSAS**

Presented To:

**Evergy Metro, Inc.**

Presented By:

**SCS ENGINEERS**

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

(913) 681-0030

December 2020

File No. 27217233.20

## CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and licensed Professional Geologist in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne 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.

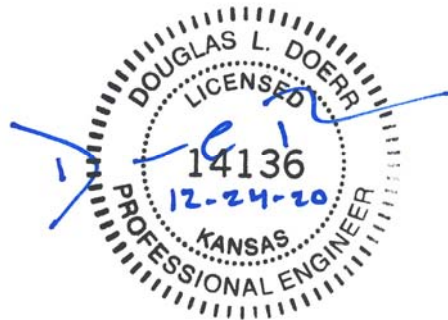


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John R. Rockhold, P.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne 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.



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Douglas L. Doerr, P.E.

SCS Engineers

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## Appendices

- Appendix A Figure 1**
- Appendix B Box and Whiskers Plots**
- Appendix C 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 and Lower AQC Impoundment at the La Cygne Generating Station has been completed in substantial compliance with the “Statistical Method Certification by A Qualified Professional Engineer” dated October 12, 2017. Detection monitoring groundwater samples were collected on May 19, 2020. Review and validation of the results from the May 2020 Detection Monitoring Event was completed on June 29, 2020, 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 July 13, 2020 and August 27, 2020.

The completed statistical evaluation identified two Appendix III constituents above the prediction limits established for monitoring well MW-14R.

Constituent/Monitoring Well	*UPL	Observation May 19, 2020	1st Verification July 13, 2020	2nd Verification August 27, 2020
<b>Chloride</b>				
MW-14R	6.113	6.21	6.38	6.25
<b>Fluoride</b>				
MW-14R	0.3031	0.329	0.336	0.312

\*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 two SSIs above the background prediction limit for chloride and fluoride in monitoring well MW-14R.**

### 3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration 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 SSIs for the CCR Landfill and Lower AQC Impoundment at the La Cygne Generating Station, there are multiple lines of supporting evidence to indicate they are not caused by a release from the CCR Landfill and Lower AQC Impoundment. Select multiple lines of supporting evidence are described as follows.

#### 3.1 UPGRADIENT WELL LOCATION

**Figure 1 in Appendix A** shows a potentiometric surface contour map indicating the direction of groundwater flow at and near the CCR Landfill and Lower AQC Impoundment at the time of sampling. The groundwater flow directions indicated are for the May 2020 groundwater monitoring event and are typical flow directions for this unit. As seen in the map, monitoring well MW-14R is located upgradient or cross-gradient from the CCR Landfill and Lower AQC Impoundment indicating the SSI for chloride and fluoride in MW-14R are not caused by a release from the CCR Landfill and Lower AQC Impoundment. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSIs above background levels for chloride and fluoride, or that the respective SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

#### 3.2 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, 25<sup>th</sup> and 75<sup>th</sup> 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 were prepared for chloride and fluoride for upgradient wells MW-601, MW-602, MW-10, and MW-13 and up/cross-gradient well MW-14R. The chloride concentrations in the upgradient wells are greater than the chloride concentration in monitoring well MW-14R. The fluoride concentrations in the upgradient wells are greater than the concentration in well MW-14R. The comparison indicates the chloride and fluoride concentrations in MW-14R are not caused by the CCR Landfill or the Lower AQC Impoundment. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSI above background levels for chloride and fluoride, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whiskers plots are provided in **Appendix B**.

### 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. 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 and fluoride were prepared for the CCR monitoring system upgradient wells MW-601, MW-602, MW-10, and MW-13 and up/cross-gradient well MW-14R. The chloride concentrations in the upgradient wells are greater than the chloride concentration in monitoring well MW-14R. The fluoride concentrations in all but one of the upgradient wells are greater than the concentration in well MW-14R. The comparison indicates the chloride and fluoride concentrations in MW-14R are not caused by the CCR Landfill or the Lower AQC Impoundment. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSI above background levels for chloride and fluoride, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots are provided in **Appendix C**.

## 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 and Lower AQC Impoundment caused the SSIs for chloride and fluoride, 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 CCR Landfill and Lower AQC 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 La Cygne Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represent 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 signature. 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**

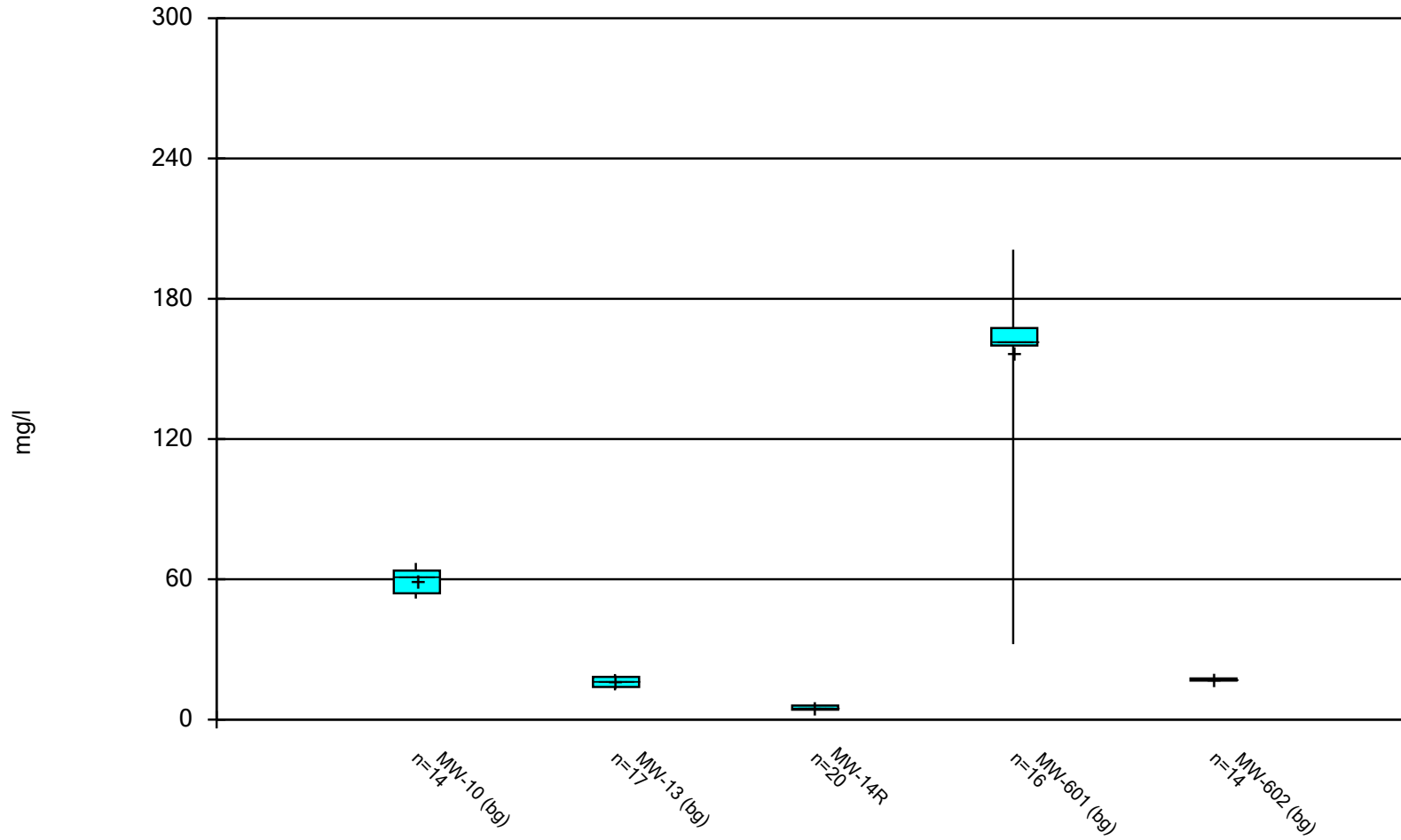
### **Figure 1**



## **Appendix B**

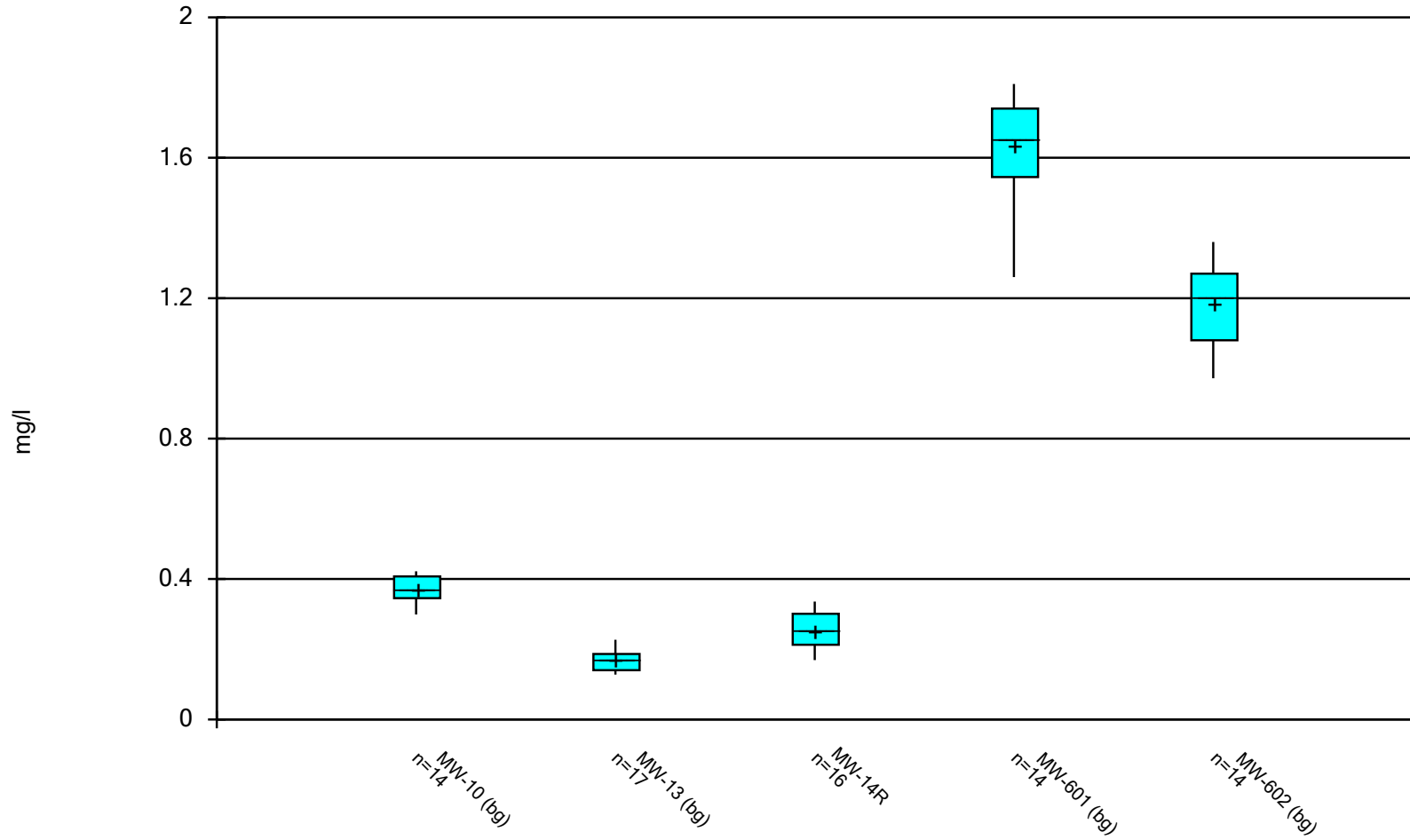
### **Box and Whiskers Plots**

### Box & Whiskers Plot



Constituent: CHLORIDE Analysis Run 10/7/2020 2:45 PM View: LF LAQC III  
LaCygne Client: SCS Engineers Data: LaC GW Data

### Box & Whiskers Plot



Constituent: FLUORIDE Analysis Run 10/7/2020 2:45 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

# Box & Whiskers Plot

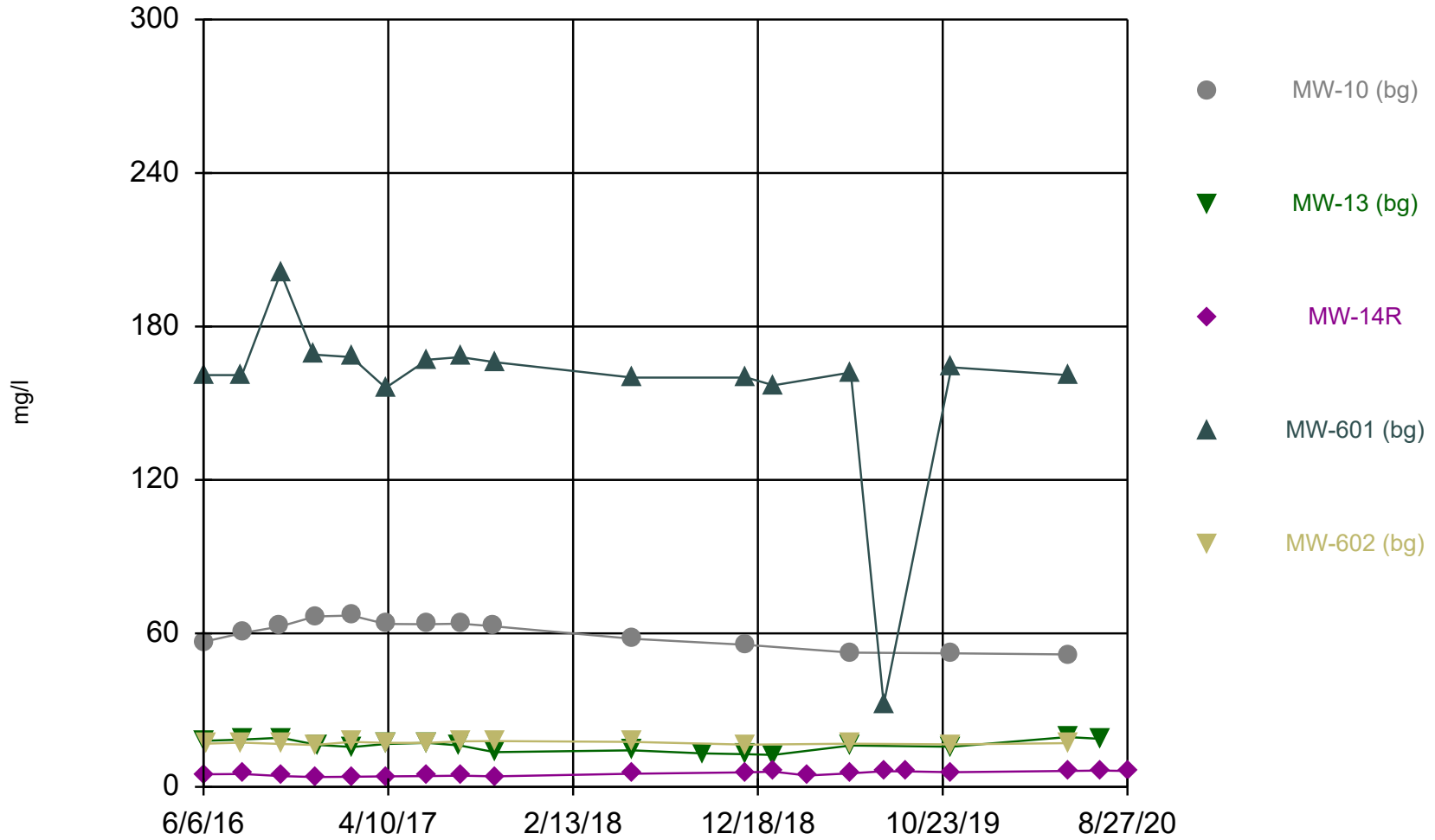
LaCygne Client: SCS Engineers Data: LaC GW Data Printed 10/7/2020, 2:47 PM

<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>
CHLORIDE (mg/l)	MW-10 (bg)	14	59.79	5.321	1.422	61.45	51.8	67	0
CHLORIDE (mg/l)	MW-13 (bg)	17	16.14	2.269	0.5503	16.2	12.5	19.5	0
CHLORIDE (mg/l)	MW-14R	20	5.117	0.8895	0.1989	5.11	3.86	6.38	0
CHLORIDE (mg/l)	MW-601 (bg)	16	157.1	34.83	8.707	161.5	32.3	201	0
CHLORIDE (mg/l)	MW-602 (bg)	14	17.13	0.4762	0.1273	17.15	16.4	17.9	0
FLUORIDE (mg/l)	MW-10 (bg)	14	0.3689	0.03865	0.01033	0.3705	0.299	0.422	0
FLUORIDE (mg/l)	MW-13 (bg)	17	0.1701	0.02698	0.006543	0.171	0.128	0.227	0
FLUORIDE (mg/l)	MW-14R	16	0.2548	0.05271	0.01318	0.252	0.169	0.336	0
FLUORIDE (mg/l)	MW-601 (bg)	14	1.633	0.1455	0.03889	1.655	1.26	1.81	0
FLUORIDE (mg/l)	MW-602 (bg)	14	1.187	0.1071	0.02861	1.205	0.972	1.36	0

## **Appendix C**

### **Time Series Plots**

# Time Series



Constituent: CHLORIDE Analysis Run 10/7/2020 2:50 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data



### Time Series

