

2021 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

27217233.21 | January 2021

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

CERTIFICATIONS

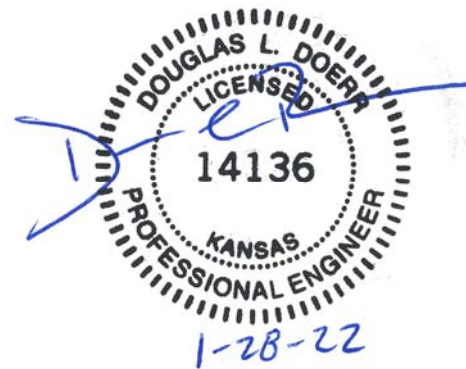
I, John R. Rockhold, being a qualified groundwater scientist and Professional Geologist in the State of Kansas, do hereby certify that the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne Generating Station was prepared by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



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 2021 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).



Douglas L. Doerr, P.E.

SCS Engineers

2021 Groundwater Monitoring and Corrective Action Report

Revision Number	Revision Date	Revision Sections	Summary of Revisions

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1 INTRODUCTION

This 2021 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the “Coal Combustion Residuals (CCR) Final Rule” (Rule) published by the United States Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015), and subsequent revisions. Specifically, this report was prepared for Evergy Metro, Inc. (Evergy) to fulfill the requirements of 40 CFR 257.90 (e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill 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, 2021), 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, 2021), 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 2021	MW-14R	Chloride	Successful
Spring 2021	MW-803	Chloride	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 2021.

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

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

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

2021 Groundwater Monitoring and Corrective Action Report

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 2021. Only detection monitoring was conducted in 2021.

2.5 § 257.90(e)(5) OTHER REQUIREMENTS

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

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

2.5.1 § 257.90(e) Program Status

Status of Groundwater Monitoring and Corrective Action Program.

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

Summary of Key Actions Completed.

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

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

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

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

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

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

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

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

The following demonstration report is included as **Appendix C**:

- C.1 Groundwater Monitoring Alternative Source Demonstration Report May 2021 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (January 2022).

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

Figure 2: Potentiometric Surface Map (May 2021)

Figure 3: Potentiometric Surface Map (November 2021)

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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. DRONE IMAGE DATED JANUARY 2021. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.


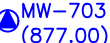



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SHEET TITLE		SITE MAP					
CCR LANDFILL & LOWER AQC IMPOUNDMENT		CCR GROUNDWATER MONITORING SYSTEM					
PROJECT TITLE		2021 CCR GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT					
CLIENT							
ENERGY METRO, INC LA CYGNE GENERATING STATION LA CYGNE, KANSAS							
SCS ENGINEERS							
8875 W. 110th St. Ste. 100 Overland Park, Kansas 66210 PH: (913) 681-0630 FAX: (913) 681-0012							
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FIGURE NO. 1							

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LEGEND

-  CCR UNIT BOUNDARY (APPROXIMATE LIMITS OF UNIT)
-  MW-703 (877.00) CCR GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
-  -875- GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (REPRESENTATIVE FOR THIS UNIT)

NOTES:

1. KDHE FACILITY PERMIT AND LANDFILL PERMIT BOUNDARIES VARY FROM THAT SHOWN.
2. DRONE IMAGE DATED JANUARY 2021. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.



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SHEET TITLE	POTENTIOMETRIC SURFACE MAP CCR LANDFILL- LAQC IMPOUNDMENT (MAY 2021)		
PROJECT TITLE	2021 CCR GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT		
CLIENT	EVERGY METRO, INC LA CYGNE GENERATING STATION LA CYGNE, KANSAS		
SCS ENGINEERS	8875 W. 110th St. Ste. 100 Overland Park, Kansas 66210 PH: (913) 681-0630 FAX: (913) 681-0012 DWN. BY: MBU Q/A RW BY: JRR CHK. BY: JF PROJ. MGR: JRR DSK. BY: DAW		
CADD FILE:	LA CYGNE LF LAQC MP & UAQC FIG 1_MAY2021_V3.dwg		
DATE:	1/19/22		
FIGURE NO.	2		

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LEGEND

- CCR UNIT BOUNDARY
(APPROXIMATE LIMITS OF UPPER AQC IMPOUNDMENT)
- MW-703 (877.00) CCR GROUNDWATER MONITORING SYSTEM WELLS
(GROUNDWATER ELEVATION)
- 875- GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS
(REPRESENTATIVE FOR THIS UNIT)

NOTES:

1. KDHE FACILITY PERMIT AND LANDFILL PERMIT BOUNDARIES VARY FROM THAT SHOWN.
2. DRONE IMAGE DATED JANUARY 2021. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.
4. WATER LEVEL MEASUREMENTS COMPLETED ON NOVEMBER 18, 2021.



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SHEET TITLE
POTENTIOMETRIC SURFACE MAP (NOVEMBER 2021)
LAQC

PROJECT TITLE
2021 CCR GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

CLIENT
EVERGY METRO, INC
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

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PROJ. NO. 27217233.20
D/SK BY: DAW
D/WN BY: MBU
CHK BY: JF
D/A RW BY: JRR
PROJ. MGR: JRR

CADD FILE:
LA CYGNE LF LAQC Imp & UAQC Fig 1_NOV_2021 - v2.dwg

DATE:
1/19/22

FIGURE NO.
3

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
CCR Landfill and Lower AQC Impoundment
Appendix III Detection Monitoring Results
Evergy La Cygne Generating Station

Well Number	Sample Date	Appendix III Constituents						Total Dissolved Solids (mg/L)
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	
MW-10	5/18/2021	0.839	51.0	50.6	0.419	7.34	14.7	559
MW-10	11/18/2021	0.781	48.6	50.3	0.327	7.22	7.03	542
MW-13	5/18/2021	0.345	385	19.0	<1.50	6.70	1810	2640
MW-13	11/18/2021	0.348	403	16.1	0.132 (J)	6.90	1710	2480
MW-14R	2/4/2021	---	---	*6.56	*0.291	*7.09	---	---
MW-14R	3/3/2021	---	---	*5.95	---	**7.78	---	---
MW-14R	5/18/2021	0.746	54.7	6.47	0.330	7.42	60.8	543
MW-14R	7/21/2021	---	---	*6.15	*0.302	**7.36	---	---
MW-14R	8/30/2021	---	---	*6.35	---	**7.69	---	---
MW-14R	11/18/2021	0.810	52.2	7.04	0.294	7.39	63.1	535
MW-15	5/18/2021	0.237	102	12.6	0.285	7.32	203	740
MW-15	11/18/2021	0.245	104	11.7	0.220	7.25	193	740
MW-601	2/4/2021	---	---	---	---	*8.14	*9.76	---
MW-601	3/3/2021	---	---	---	---	**7.88	*6.73	---
MW-601	5/18/2021	1.83	16.7	169	1.73	7.66	7.04	952
MW-601	7/21/2021	---	---	---	---	**7.73	*7.71	---
MW-601	8/30/2021	---	---	---	---	**7.96	*4.98 (J)	---
MW-601	11/18/2021	1.83	17.2	166	1.61	7.50	6.77	890
MW-602	2/4/2021	---	---	---	---	**7.87	*26.7	---
MW-602	5/18/2021	2.27	23.5	16.8	1.23	7.66	26.2	578
MW-602	11/18/2021	2.29	23.2	17.1	1.14	7.27	25.9	592
MW-801	5/18/2021	2.21	24.8	98.7	1.09	7.66	2.36 (J)	843
MW-801	11/18/2021	2.21	25.6	96.2	0.997	7.51	2.82 (J)	805
MW-802	5/18/2021	2.44	28.0	37.7	1.12	7.64	<5.00	684
MW-802	7/21/2021	---	---	---	*1.04	**7.35	---	---
MW-802	11/18/2021	2.46	28.0	39.6	0.904	7.42	<5.00	652
MW-803	5/18/2021	2.00	37.9	50.2	0.614	7.78	25.2	571
MW-803	7/21/2021	---	---	*51.1	---	**7.44	---	---
MW-803	8/30/2021	---	---	*50.1	---	**7.41	---	---
MW-803	11/18/2021	2.07	40.0	51.0	0.531	7.42	27.2	594
MW-804	5/18/2021	1.57	65.1	28.8	0.465	7.39	25.9	537
MW-804	7/21/2021	---	---	---	---	**7.35	*26.0	---
MW-804	8/30/2021	---	---	---	---	**7.14	*24.4	---
MW-804	11/18/2021	1.56	66.8	29.3	0.465	7.19	24.6	539
MW-805	5/18/2021	0.550	443	509	0.197	6.58	724	2020
MW-805	11/18/2021	0.546	452	472	0.175	6.44	702	2010

* 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

(J) - Reported concentration is below the laboratory reporting limit - concentration is estimated.

--- Not Sampled

**Table 2
CCR Landfill and Lower AQC Impoundment
Detection Monitoring Field Measurements
Every 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	5/18/2021	7.34	1060	15.85	0.00	-146	0.00	2.21	872.74
MW-10	11/18/2021	7.22	1030	14.33	0.00	-147	0.00	1.20	873.75
MW-13	5/18/2021	6.70	2970	15.55	0.00	129	0.29	2.47	874.75
MW-13	11/18/2021	6.90	2940	14.95	0.00	95	2.10	2.75	874.47
MW-14R	2/4/2021	*7.09	943	8.72	3.70	109	9.63	9.34	869.49
MW-14R	3/3/2021	**7.78	943	14.79	3.10	73	3.68	10.05	868.78
MW-14R	5/18/2021	7.42	1020	16.64	0.00	43	0.98	7.94	870.89
MW-14R	7/21/2021	**7.36	971	17.95	0.00	-10	0.00	6.59	872.24
MW-14R	8/30/2021	**7.69	902	19.78	0.00	-62	0.00	7.17	871.66
MW-14R	11/18/2021	7.39	991	13.84	0.00	-89	0.00	7.34	871.49
MW-15	5/18/2021	7.32	1240	17.71	0.00	99	2.15	8.10	865.78
MW-15	11/18/2021	7.25	1200	13.73	0.00	93	0.00	8.95	864.93
MW-601	2/4/2021	*8.14	1540	7.83	13.70	80	6.45	11.65	867.53
MW-601	3/3/2021	**7.88	1620	15.05	7.10	62	0.74	11.65	867.53
MW-601	5/18/2021	7.66	1760	16.33	0.00	14	1.61	11.41	867.77
MW-601	7/21/2021	**7.73	1710	19.32	0.00	-59	1.22	10.70	868.48
MW-601	8/30/2021	**7.96	1410	22.35	14.10	-27	0.00	10.01	869.17
MW-601	11/18/2021	7.50	1700	15.68	5.10	-83	0.00	9.15	870.03
MW-602	2/4/2021	**7.87	942	8.89	21.90	164	1.60	4.77	875.12
MW-602	5/18/2021	7.66	1070	16.81	0.00	50	1.76	4.60	875.29
MW-602	11/18/2021	7.27	1030	15.25	19.40	-81	0.00	4.93	874.96
MW-801	5/18/2021	7.66	1450	19.24	4.60	-109	3.44	1.60	856.05
MW-801	11/18/2021	7.51	1420	14.31	0.00	-82	0.00	2.93	854.72
MW-802	5/18/2021	7.64	1170	16.19	0.00	-110	3.12	3.30	850.17
MW-802	7/21/2021	**7.35	1130	20.84	0.00	-88	0.00	4.06	849.41
MW-802	11/18/2021	7.42	1170	15.64	0.00	-93	0.00	4.65	848.82
MW-803	5/18/2021	7.78	1030	17.40	2.00	210	6.57	10.95	844.05
MW-803	7/21/2021	**7.44	1030	19.27	0.00	18	2.77	12.05	842.95
MW-803	8/30/2021	**7.41	1040	21.05	2.90	84	0.91	15.60	839.40
MW-803	11/18/2021	7.42	1090	15.35	0.00	42	0.00	15.30	839.70
MW-804	5/18/2021	7.39	950	18.76	0.00	285	6.14	10.02	845.18
MW-804	7/21/2021	**7.35	970	20.99	0.00	-51	0.95	10.39	844.81
MW-804	8/30/2021	**7.14	933	20.73	4.80	-28	0.83	9.96	845.24
MW-804	11/18/2021	7.19	995	15.70	0.00	4	0.00	8.50	846.70
MW-805	5/18/2021	6.58	2930	20.08	8.60	510	4.55	6.29	848.34
MW-805	11/18/2021	6.44	3240	16.22	3.30	200	0.00	8.77	845.86

* 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 2021 Groundwater Monitoring Event, CCR Landfill
and Lower AQC Impoundment, La Cygne Generating Station
(January 2022)

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
MAY 2021 GROUNDWATER MONITORING EVENT

CCR LANDFILL AND LOWER AQC IMPOUNDMENT

La Cygne Generating Station
Eversource Energy, Inc
La Cygne, Kansas

SCS ENGINEERS

January 2022
File No. 21217233.21

SCS Engineers
8575 W 110th St, Suite 100
Overland Park, Kansas 66210
913-681-0030

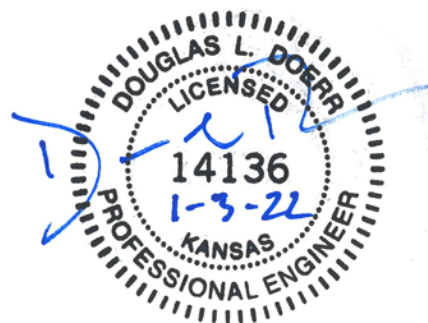
CERTIFICATIONS

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.



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.



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 18, 2021. Review and validation of the results from the May 2021 Detection Monitoring Event was completed on July 8, 2021, 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 21, 2021 and August 30, 2021.

The completed statistical evaluation identified two Appendix III constituents above their respective prediction limits established for monitoring wells MW-14R and MW-803.

Constituent/Monitoring Well	*UPL	Observation May 18, 2021	1 st Verification July 21, 2021	2 nd Verification August 30, 2021
MW-14R				
Chloride	6.113	6.47	6.15	6.35
MW-803				
Chloride	49.94	50.2	51.1	50.1

*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 at MW-14R and MW-803.

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 2021 groundwater monitoring event and are typical flow directions for this unit. As seen in the map, monitoring well MW-14R is located upgradient/cross-gradient from the CCR Landfill and Lower AQC Impoundment indicating the SSI for chloride in MW-14R is 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 SSI above the background level for chloride, or that the SSI 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, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

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

Box and whiskers plots were prepared for chloride for upgradient wells MW-602, MW-10, and MW-13, up/cross-gradient well MW-14R and downgradient well MW-803. The chloride concentrations in the upgradient wells are greater than the chloride concentration in monitoring well MW-14R. The chloride concentrations in upgradient well MW-10 is greater than the chloride concentration in monitoring well MW-803. The comparison indicates the chloride concentrations in MW-14R and MW-803 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 SSIs above background levels for chloride, or that the SSIs 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 were prepared for the CCR monitoring system for upgradient wells MW-602, MW-10, and MW-13, up/cross-gradient well MW-14R and downgradient well MW-803. The chloride concentrations in the upgradient wells are greater than the chloride concentration in monitoring well MW-14R. The chloride concentrations in upgradient well MW-10 is greater than the chloride concentration in monitoring well MW-803. The comparison indicates the chloride concentrations in MW-14R and MW-803 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 SSIs above background levels for chloride, 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 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, 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

\\kan-fs01\clients\KCPL\Projects\Groundwater\DWG\La Cygne\2021\Alternative Source Demonstration\La Cygne LF LAQC Imp & UAQC Fig 1_MAY2021 v.3.dwg Jan 03, 2022 - 9:45am Layout Name: Fig 1 Lower By: 4415alr



LEGEND

- CCR UNIT BOUNDARY (APPROXIMATE LIMITS OF UNIT)
- MW-703 (877.00) CCR GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- 875- GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (REPRESENTATIVE FOR THIS UNIT)

NOTES:

1. KDHE FACILITY PERMIT AND LANDFILL PERMIT BOUNDARIES VARY FROM THAT SHOWN.
2. DRONE IMAGE DATED JANUARY 2021. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.

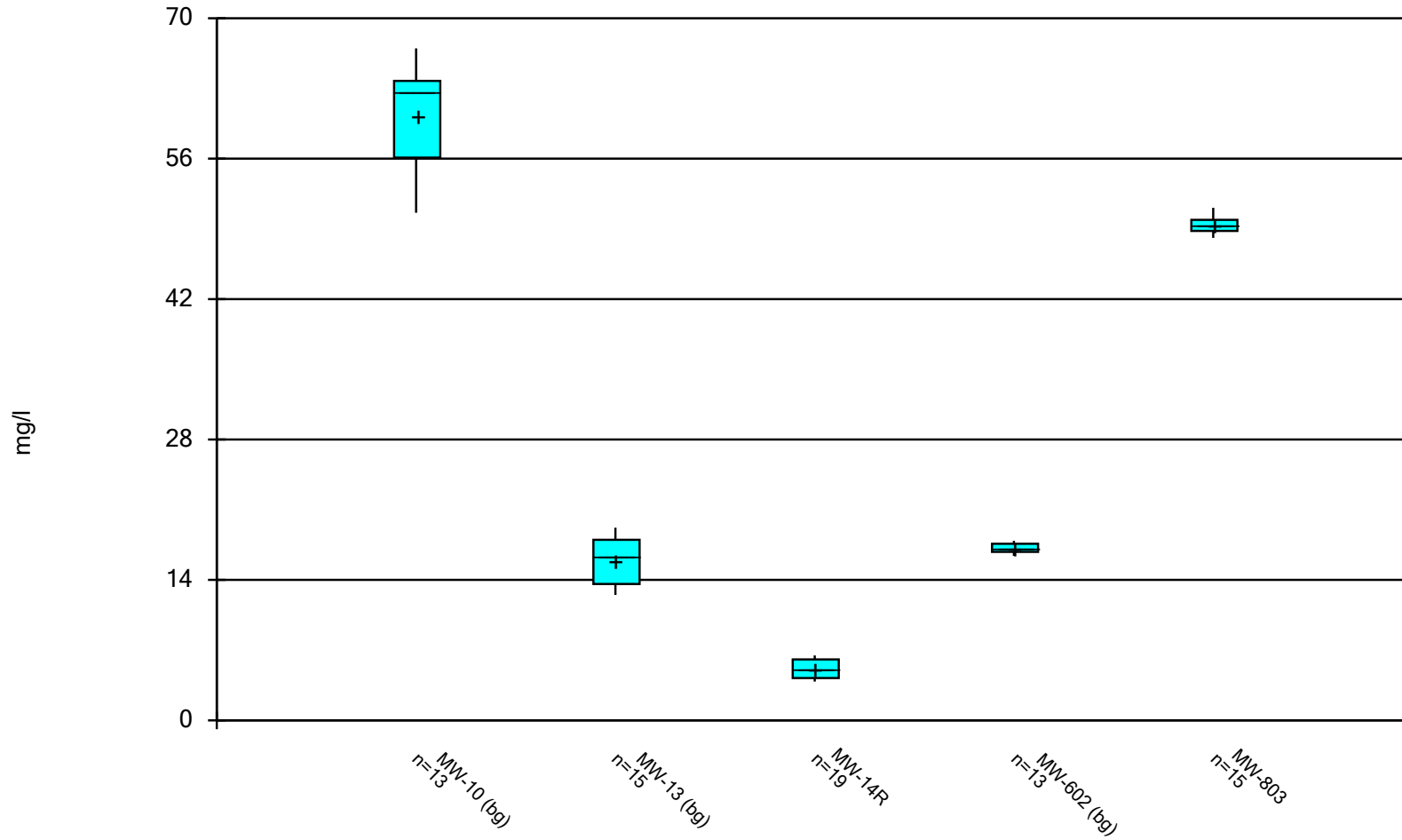


SHEET TITLE	POTENTIOMETRIC SURFACE MAP CCR LANDFILL- LAQC IMPOUNDMENT (MAY 2021)	REV.	DATE	CK:	BY:
	PROJECT TITLE LA CYGNE CCR LANDFILL - LAQC IMPOUNDMENT ALTERNATIVE SOURCE DEMONSTRATION	△	-	-	-
CLIENT	EVERGY METRO, INC LA CYGNE GENERATING STATION LA CYGNE, KANSAS	SCS ENGINEERS 8875 W. 110th St. Ste. 100 Overland Park, Kansas 66210 PH: (913) 681-0630 FAX: (913) 681-0012 DWN. BY: MBLU Q/A RW BY: JRR CHK. BY: JF PRD. MGR: JRR DSK. BY: DAW			
CADD FILE:	LA CYGNE LF LAQC MP & UAQC FIG 1_MAY2021_V3.dwg	DATE: 12/30/21			
FIGURE NO.	1				

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: CHLORIDE Analysis Run 12/29/2021 5:16 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

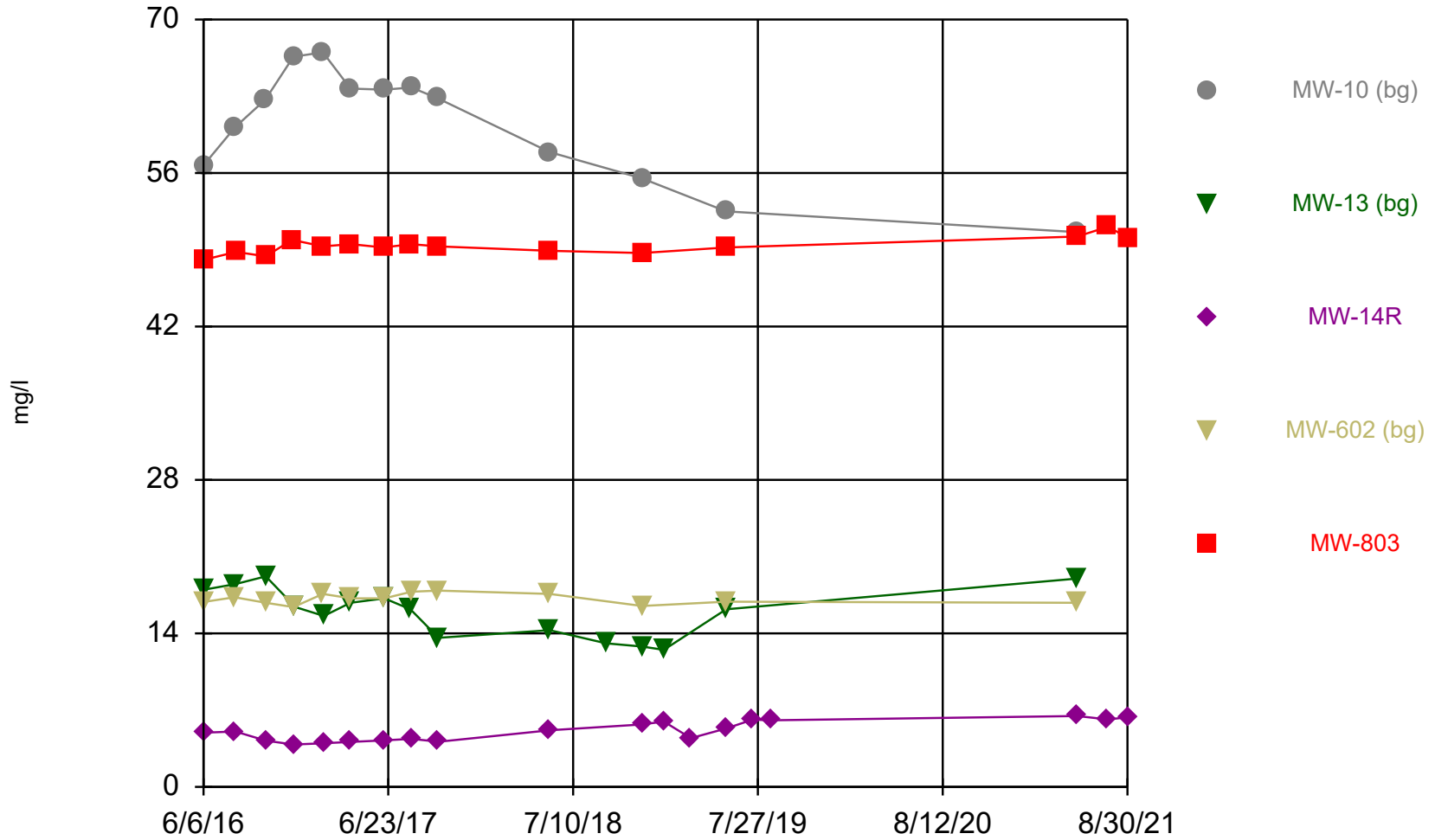
LaCygne Client: SCS Engineers Data: LaC GW Data Printed 12/29/2021, 5:18 PM

<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)	13	60.28	5.228	1.45	62.7	50.6	67	0
CHLORIDE (mg/l)	MW-13 (bg)	15	15.96	2.26	0.5835	16.2	12.5	19.2	0
CHLORIDE (mg/l)	MW-14R	19	5.089	0.9109	0.209	5.05	3.86	6.47	0
CHLORIDE (mg/l)	MW-602 (bg)	13	17.15	0.4807	0.1333	17.2	16.4	17.9	0
CHLORIDE (mg/l)	MW-803	15	49.35	0.7624	0.1968	49.3	48.1	51.1	0

Appendix C

Time Series Plots

Time Series



Constituent: CHLORIDE Analysis Run 12/29/2021 5:14 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

Constituent: CHLORIDE (mg/l) Analysis Run 12/29/2021 5:16 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-10 (bg)	MW-13 (bg)	MW-14R	MW-602 (bg)	MW-803
6/6/2016	56.7				
6/9/2016		18	4.95		48.1
6/10/2016				16.9	
8/9/2016				17.3	
8/11/2016	60.2	18.5	5.05		
8/12/2016					48.8
10/12/2016	62.7				
10/13/2016		19.2	4.22	16.8	48.4
12/6/2016					49.9
12/9/2016	66.6		3.86	16.4	
12/13/2016		16.4			
2/8/2017	67			17.6	49.3
2/9/2017			3.98		
2/10/2017		15.6			
4/6/2017	63.7	16.8			
4/7/2017			4.11	17.2	49.5
6/13/2017					49.2
6/15/2017	63.6	17.2	4.25	17.2	
8/8/2017		16.2			
8/9/2017					49.5
8/10/2017	63.8		4.38	17.8	
10/4/2017	62.8				49.3
10/5/2017		13.6	4.12	17.9	
5/23/2018	57.9	14.3	5.17	17.6	48.9
9/17/2018		13.1			
11/30/2018	55.5	12.8	5.69	16.5	48.7
1/14/2019		12.5	5.96		
3/11/2019			4.44		
5/23/2019	52.5	16.2	5.33	16.9	49.2
7/17/2019			6.14		
8/23/2019			6.08		
5/18/2021	50.6	19	6.47	16.8	50.2
7/21/2021			6.15		51.1
8/30/2021			6.35		50.1