GOLDER
MEMBER OF WSP

REPORT

2021 Annual Groundwater Monitoring and Corrective Action Report

SCPC Surface Impoundment, Sioux Energy Center, St. Charles County, Missouri, USA

Submitted to:

Ameren Missouri

1901 Chouteau Avenue, St. Louis, Missouri 63103

Submitted by:

Golder Associates USA Inc.

701 Emerson Road, Suite 250, Creve Coeur, Missouri, USA 63141

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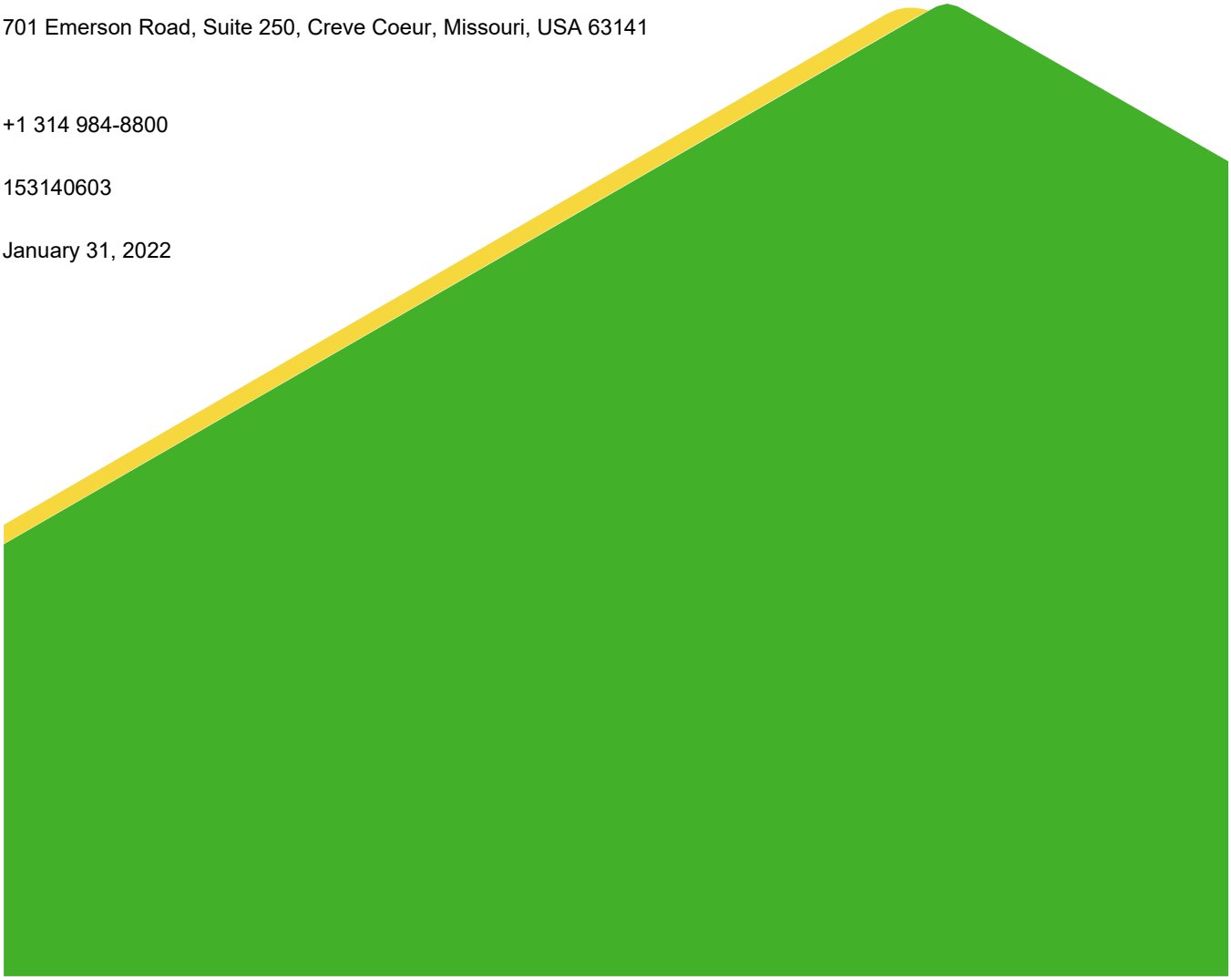
153140603

January 31, 2022



1.0 EXECUTIVE SUMMARY AND STATUS OF THE SCPC GROUNDWATER MONITORING PROGRAM

This annual report was developed to meet the requirements of United States Environmental Protection Agency (USEPA) 40 CFR Part 257 “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule” (the CCR Rule). The CCR Rule requires owners or operators of existing CCR units to produce an Annual Groundwater Monitoring and Corrective Action Report (Annual Report) each year (§ 257.90(e)). Ameren Missouri (Ameren) has determined that the Utility Waste Landfill (UWL) SCPC Surface Impoundment (or Cell 1) at the Sioux Energy Center (SEC) is subject to the requirements of the CCR Rule. This Annual Report for the SCPC describes CCR Rule groundwater monitoring activities from January 1, 2021 through December 31, 2021, including verification results related to late 2020 sampling.

Throughout 2021, the SCPC CCR unit has been operating under the Detection Monitoring Program (§257.94) which began October 17, 2017. As a part of Detection Monitoring, statistical evaluations are completed after each sampling event to determine if there are any values that represent a Statistically Significant Increase (SSI) over background concentrations. In 2021, SSIs have been determined during each sampling event and a summary of the SSIs for the past year is provided in **Table 1**.

Table 1 - Summary of 2021 SCPC Sampling Events, Previous Year Verification, and Statistical Evaluations

Event Name	Type of Event and Sampling Dates	Laboratory Analytical Data Receipt Date	Parameters Collected	Verified SSI	SSI Determination Date	ASD Completion Date
November 2020 Sampling Event	Detection Monitoring, November 16-17, 2020	December 28, 2020	Appendix III, Major Cations and Anions	**Calcium:** DG-2 **Fluoride:** DG-4	March 26, 2021	June 24, 2021
	Verification Sampling, January 8, 2021	January 18, 2021	Detected Appendix III parameters (See Note 1)			
April 2021 Sampling Event	Detection Monitoring, April 13-14, 2021	May 13, 2021	Appendix III, Major Cations and Anions	**Calcium:** DG-4 **TDS:** DG-4	August 11, 2021	November 9, 2021
	Verification Sampling, June 2, 2021	June 18, 2021	Detected Appendix III parameters (See Note 1)			
November 2021 Sampling Event	Detection Monitoring, November 8-10, 2021	December 28, 2021	Appendix III, Major Cations and Anions	To be determined after statistical analysis and Verification Sampling are completed in 2022.		

Notes:
1) Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
2) SSI – Statistically Significant Increase.
3) ASD – Alternative Source Demonstration.
4) TDS – Total Dissolved Solids.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Alternative Source Demonstrations (ASDs) were prepared for each of these sampling events and are discussed further in this Annual Report.

There were no changes made to the monitoring system in 2021 with no new wells being installed or decommissioned.

On August 28, 2020, the USEPA issued revisions to the CCR Rule (40 C.F.R. § 257.101(a)(1), or "Part A") that require all unlined surface impoundments[1] to initiate closure by April 11, 2021, unless an alternative deadline is requested and approved. To comply with these regulations, Ameren completed and posted to its website a "Request for Alternative Closure Requirement" where closure of the SCPC is scheduled to be completed by October 15, 2023. On November 25, 2021, Ameren posted an Annual Progress Report on the Part A Request. On January 11, 2022, The USEPA posted to its website (https://www.epa.gov/coalash/coal-combustion-residuals-ccr-part-implementation) a Prepublication Copy of its decision on the Part A request titled "*Proposed Date to Cease Receipt of Waste for Sioux Energy Center based on Interim Determination of Incompleteness of Demonstration."* Further information on the closure of the SCPC Surface Impoundment will be included in the 2022 Annual Report.

[1] As identified in the Part A application for the SCPC, the SCPC has a composite bottom liner consisting of 60-mil HDPE over 2 feet of clay with a maximum permeability of $1x10^{-7}$ centimeters per second. The unit was built in 2010 and meets the requirements of CCR Rule except for 40 CFR §257.60(a) (Placement Above the Uppermost Aquifer).

Table of Contents

2.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the SCPC. The groundwater monitoring system consists of eight (8) groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**. No new monitoring wells were installed or decommissioned in 2021 as a part of the CCR Rule monitoring program for the SCPC. For more information on the groundwater monitoring network, details are provided in the previous Annual Groundwater Monitoring Reports for the SCPC.

3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the SCPC CCR Unit in 2021. **Table 2** below provides a summary of the groundwater samples collected in 2021 including the number of samples, the date of sample collection, and the monitoring program.

Table 2 – Summary of Groundwater Sampling Dates

Sampling Event	Groundwater Monitoring Wells								Monitoring Program
	BMW-1S	BMW-3S	UG-1A	UG-2	DG-1	DG-2	DG-3	DG-4	
	Date of Sample Collection								
January 2021 Verification Sampling	-	-	-	-	-	1/8/2021	1/8/2021	1/8/2021	Detection
April 2021 Detection Monitoring	4/13/2021	4/13/2021	4/14/2021	4/13/2021	4/14/2021	4/14/2021	4/14/2021	4/14/2021	Detection
June 2021 Verification Sampling	-	-	-	-	-	-	6/2/2021	6/2/2021	Detection
November 2021 Detection Monitoring	11/8/2021	11/8/2021	11/10/2021	11/9/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021	Detection
Total Number of Samples Collected	2	2	2	2	2	3	4	4	NA

Notes:
1.) Detection Monitoring Events tested for Appendix III Parameters.
2.) Only analytes/wells that were detected above the prediction limit were tested during verification sampling.
3.) "-" No sample collected.
4.) NA - Not applicable.

3.1 Detection Monitoring Program

A Detection Monitoring sampling event was completed November 16-17, 2020. Verification sampling and the statistical analysis to evaluate for SSIs for the November 2020 event were not completed until 2021 and are, therefore, included in this report. Detections of Appendix III analytes triggered a verification sampling event, which was completed on January 8, 2021, and verified SSIs. **Table 3** summarizes the results of the statistical analysis of the November 2020 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. An

ASD was completed for the SSIs and is provided in **Appendix B**. This ASD demonstrates that the SSIs are not caused by the SCPC CCR Unit and the SCPC CCR Unit remains in Detection Monitoring.

Detection Monitoring samples were collected April 13-14, 2021, and testing was completed for all Appendix III analytes, as well as major cations and anions. Detections of Appendix III analytes triggered Verification Sampling, which was completed June 2, 2021. Statistical analysis of the data determined an SSI. **Table 4** summarizes the results of the statistical analysis of the April 2021 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**. As with the November 2020 sampling event, SSIs reported for the monitoring data are not caused by the SCPC CCR Unit and an ASD for this is provided in **Appendix C**.

As outlined in the Statistical Analysis Plan for this site, updates to the statistical limits are completed once four (4) to eight (8) new sample results are available. After statistical analysis of the April 2021 sampling event, the statistical limits used to determine an SSI were updated according to the Statistical Analysis Plan. These updated limits will be used for November 2021 and subsequent statistical analyses.

A Detection Monitoring sampling event was completed November 8-10, 2021, and testing was performed for all Appendix III analytes, as well as major cations and anions. Statistical analyses to evaluate for SSIs in the November 2021 data were not completed in 2021 and the results will be provided in the 2022 Annual Report. **Table 5** summarizes the results of the November 2021 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

3.2 Groundwater Elevation, Flow Rate and Direction

To meet the requirements of §257.93(c), water level measurements were taken at all monitoring wells prior to the start of groundwater purging and sampling. Static water levels were measured within a 24-hour period in each monitoring well using an electronic water level indicator.

Groundwater elevations were used to generate potentiometric surface maps included in **Appendix D**. As shown on the potentiometric surface maps, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Mississippi and Missouri Rivers, since the alluvial aquifer is hydraulically connected to these water bodies. Groundwater in the alluvial aquifer will generally flow from the higher of the two rivers toward the lower elevation river. Water flows into and out of the alluvial aquifer as a result of fluctuating river water levels that produce “bank recharge” and “bank discharge” conditions. At this facility, groundwater can flow north and south toward the Mississippi and Missouri Rivers, depending on river levels.

Groundwater flow direction and hydraulic gradient were estimated for the alluvial aquifer wells at the SEC using commercially available software. Results from this assessment indicate that groundwater flow direction is variable due to fluctuating river levels but has typically flowed from north to south. The overall net groundwater flow in the alluvial aquifer at the SEC was slightly to the east due to reversals in flow as a result of variable river levels in the Missouri and Mississippi Rivers. Horizontal gradients calculated by the program range from 0.00006 to 0.0009 feet/foot with an estimated net annual groundwater movement of approximately three (3) feet in the prevailing downgradient direction.

3.3 Sampling Issues

No notable sampling issues were encountered at the SCPC in 2021.

4.0 ACTIVITIES PLANNED FOR 2022

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2022. Statistical analysis of the November 2021 Detection Monitoring data will be completed in 2022 and included in the 2022 Annual Report.

Tables

Table 3
November 2020 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
November 2020 Detection Monitoring Event															
DATE	NA	11/16/2020	11/16/2020	NA	11/17/2020	NA	11/17/2020	NA	11/17/2020	NA	11/17/2020	NA	11/17/2020	NA	11/16/2020
pH	SU	6.96	7.07	6.436-7.44	7.05	6.63-7.528	7.32	6.714-7.386	7.09	6.773-7.387	7.12	6.355-7.543	7.02	6.527-7.384	7.13
BORON, TOTAL	µg/L	75.1 J	66.3 J	327	148	208.9	149	130.1	80.9 J	127.6	83.4 J	126	90.6 J	119.5	77.4 J
CALCIUM, TOTAL	µg/L	141,000	125,000	177,869	139,000	129,922	108,000	142,166	119,000	139,133	145,000	156,515	160,000	143,189	132,000 J
CHLORIDE, TOTAL	mg/L	7.0	11.4	145.9	87.2	108.8	20.6	11.18	1.3	9.596	3.1	16.74	3.8	119.9	68.5
FLUORIDE, TOTAL	mg/L	0.34	0.40	0.3643	0.30	0.3308	0.24	0.3797	0.35	0.4315	0.35	0.4424	0.42	0.37	0.41
SULFATE, TOTAL	mg/L	24.8	30.6	107.8	48.5	83.09	47.9	60.32	11.0	45.51	28.7	59.31	41.0	62.54	37.1
TOTAL DISSOLVED SOLIDS	mg/L	505	455	833.4	642	626	448	555.4	441	524.9	546 J	624.7	598	701	637
January 2021 Verification Sampling Event															
DATE	NA										1/8/2021		1/8/2021		1/8/2021
pH	SU														
BORON, TOTAL	µg/L														
CALCIUM, TOTAL	µg/L										141,000 J		155,000		
CHLORIDE, TOTAL	mg/L														
FLUORIDE, TOTAL	mg/L														0.45
SULFATE, TOTAL	mg/L														
TOTAL DISSOLVED SOLIDS	mg/L										509				

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: JSI
Checked By: EMS
Reviewed By: SCP

Table 4
April 2021 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
April 2021 Detection Monitoring Event															
DATE	NA	4/13/2021	4/13/2021	NA	4/14/2021	NA	4/13/2021	NA	4/14/2021	NA	4/14/2021	NA	4/14/2021	NA	4/14/2021
pH	SU	6.85	6.98	6.436-7.44	6.84	6.63-7.528	7.09	6.714-7.386	6.95	6.773-7.387	6.96	6.355-7.543	6.90	6.527-7.384	6.84
BORON, TOTAL	µg/L	70.8 J	74.2J	327	146	208.9	120	130.1	103	127.6	98.5 J	126	92.6 J	119.5	87.5 J
CALCIUM, TOTAL	µg/L	149,000	134,000	177,869	146,000	129,922	80,500	142,166	135,000	139,133	135,000	156,515	143,000	143,189	154,000
CHLORIDE, TOTAL	mg/L	8.2	12.8	145.9	90.1	108.8	2.3	11.18	8.6	9.596	7.5	16.74	5.9	119.9	95.3
FLUORIDE, TOTAL	mg/L	0.36	0.39	0.3643	0.33	0.3308	0.28 J	0.3797	0.30	0.4315	0.38	0.4424	0.36	0.37	0.34 J
SULFATE, TOTAL	mg/L	29.4	34.8	107.8	55.4	83.09	70.6	60.32	52.0	45.51	35.4	59.31	60.9	62.54	51.1
TOTAL DISSOLVED SOLIDS	mg/L	579	509	833.4	719	626	373	555.4	533	524.9	522	624.7	535	701	808
June 2021 Verification Sampling Event															
DATE	NA												6/2/2021		6/2/2021
pH	SU														
BORON, TOTAL	µg/L														
CALCIUM, TOTAL	µg/L														152,000
CHLORIDE, TOTAL	mg/L														
FLUORIDE, TOTAL	mg/L														
SULFATE, TOTAL	mg/L												52.6		
TOTAL DISSOLVED SOLIDS	mg/L														753

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: EMS
Checked By: LMS
Reviewed By: SCP

Table 5
November 2021 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS					
ANALYTE	UNITS	BMW-1S	BMW-3S	UG-1A	UG-2	DG-1	DG-2	DG-3	DG-4
November 2021 Detection Monitoring Event									
DATE	NA	11/8/2021	11/8/2021	11/10/2021	11/9/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
pH	SU	6.86	6.99	6.70	6.90	6.88	6.92	6.88	6.86
BORON, TOTAL	µg/L	66.9 J	67.8 J	121	93.1 J	96.8 J	86.7 J	87.7 J	90.7 J
CALCIUM, TOTAL	µg/L	160,000	137,000	127,000	96,900 J	124,000	130,000	146,000	136,000
CHLORIDE, TOTAL	mg/L	7.4	12.0	50.1	33.7	1.8 J	2.7 J	2.7 J	58.3
FLUORIDE, TOTAL	mg/L	ND	0.46	0.44	0.23	0.41	0.41	0.43	0.37
SULFATE, TOTAL	mg/L	31.8	31.2	42.8 J	41.7	19.1	33.1	46.8	49.9
TOTAL DISSOLVED SOLIDS	mg/L	534	461	568	461	451	491	547	643

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.

Prepared By: LMS
Checked By: GTM
Reviewed By: MNH

Figures

KEY MAP

LEGEND

- Sioux Energy Center Property Boundary
- SCPC - WFGD Disposal Cell 1
- Water Recycle Pond

Groundwater Monitoring Wells Used for SCPC CCR Rule Monitoring

- SCPC Monitoring Well
- Background Monitoring Well

0 1,000 2,000 3,000
Feet

NOTE(S)
1.) ALL BOUNDARIES AND LOCATIONS ARE APPROXIMATE.
2.) UWL - UTILITY WASTE LANDFILL.
3.) WFGD - WET FLUE GAS DESULFURIZATION.

REFERENCE(S)
1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SITE LOCATION AERIAL MAP AND MONITORING WELL LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-12-21
DESIGNED	JSI
PREPARED	RJF
REVIEWED	EMS
APPROVED	MNH

PROJECT NO.	CONTROL	FIGURE
153140603	1240	1

PATH: G:\Projects\150 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0003 - Sioux Energy\800 - FIGURES-DRAWINGS\PRODUCTION\2019 Annual Report\[Figure 1 - SCPC_v2.mxd PRINTED ON: 2022-01-21 AT 9:14:20 AM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

APPENDIX A

Laboratory Analytical Data

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

January 18, 2021

Jeffrey Ingram
Golder Associates
13515 Barrett Parkway Drive
Suite 260
Ballwin, MO 63021

RE: Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on January 09, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Kansas City

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Ryan Feldmann, Golder
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60358712001	**S-DG-2**	Water	01/08/21 10:15	01/09/21 04:00
60358712002	**S-DG-3**	Water	01/08/21 11:18	01/09/21 04:00
60358712003	**S-DG-4**	Water	01/08/21 12:20	01/09/21 04:00
60358712004	**S-SCPC-FB-1**	Water	01/08/21 10:25	01/09/21 04:00
60358712005	**S-SCPC-DUP-1**	Water	01/08/21 08:00	01/09/21 04:00

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60358712001	**S-DG-2**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60358712002	**S-DG-3**	EPA 200.7	MRV	1	PASI-K
60358712003	**S-DG-4**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60358712004	**S-SCPC-FB-1**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60358712005	**S-SCPC-DUP-1**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Sample: S-DG-2 **Lab ID: 60358712001** Collected: 01/08/21 10:15 Received: 01/09/21 04:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**141000**	ug/L	200	32.4	1	01/12/21 15:23	01/13/21 14:30	7440-70-2	M1
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**509**	mg/L	10.0	10.0	1		01/14/21 11:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Fluoride	**0.42**	mg/L	0.20	0.075	1		01/13/21 21:15	16984-48-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Sample: S-DG-3 **Lab ID: 60358712002** Collected: 01/08/21 11:18 Received: 01/09/21 04:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**155000**	ug/L	200	32.4	1	01/12/21 15:23	01/13/21 14:45	7440-70-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Sample: S-DG-4 **Lab ID: 60358712003** Collected: 01/08/21 12:20 Received: 01/09/21 04:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**138000**	ug/L	200	32.4	1	01/12/21 15:23	01/13/21 14:47	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**580**	mg/L	10.0	10.0	1		01/14/21 11:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Fluoride	**0.45**	mg/L	0.20	0.075	1		01/12/21 19:12	16984-48-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Sample: S-SCPC-FB-1 **Lab ID: 60358712004** Collected: 01/08/21 10:25 Received: 01/09/21 04:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**<32.4**	ug/L	200	32.4	1	01/12/21 15:23	01/13/21 14:50	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		01/14/21 11:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Fluoride	**<0.075**	mg/L	0.20	0.075	1		01/12/21 19:56	16984-48-8	

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Sample: S-SCPC-DUP-1 **Lab ID: 60358712005** Collected: 01/08/21 08:00 Received: 01/09/21 04:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**132000**	ug/L	200	32.4	1	01/12/21 15:23	01/13/21 14:53	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**586**	mg/L	10.0	10.0	1		01/14/21 11:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Fluoride	**0.44**	mg/L	0.20	0.075	1		01/12/21 20:10	16984-48-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

QC Batch: 698992 — Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 — Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358712001, 60358712002, 60358712003, 60358712004, 60358712005

METHOD BLANK: 2819743 — Matrix: Water
Associated Lab Samples: 60358712001, 60358712002, 60358712003, 60358712004, 60358712005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Calcium	ug/L	<32.4	200	32.4	01/13/21 14:25	

LABORATORY CONTROL SAMPLE: 2819744

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2819745 2819746

Parameter	Units	60358712001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	141000	10000	10000	151000	143000	98	17	70-130	6	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

QC Batch: 698754 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358712001, 60358712003, 60358712004, 60358712005

METHOD BLANK: 2819098 Matrix: Water
Associated Lab Samples: 60358712001, 60358712003, 60358712004, 60358712005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/14/21 11:16	

LABORATORY CONTROL SAMPLE: 2819099

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1020	102	80-120	

SAMPLE DUPLICATE: 2819100

Parameter	Units	60358678005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	861	882	2	10	

SAMPLE DUPLICATE: 2819101

Parameter	Units	60358711001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	992	999	1	10	

SAMPLE DUPLICATE: 2819102

Parameter	Units	60358712001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	509	513	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

QC Batch: 698910
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358712003, 60358712004, 60358712005

METHOD BLANK: 2819498 Matrix: Water
Associated Lab Samples: 60358712003, 60358712004, 60358712005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.075	0.20	0.075	01/12/21 09:08	

METHOD BLANK: 2821241 Matrix: Water
Associated Lab Samples: 60358712003, 60358712004, 60358712005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.075	0.20	0.075	01/13/21 08:59	

LABORATORY CONTROL SAMPLE: 2819499

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.4	96	90-110	

LABORATORY CONTROL SAMPLE: 2821242

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2819500 2819501

Parameter	Units	60358560003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.26	2.5	2.5	2.3	2.4	82	84	80-120	2	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2819502 2819503

Parameter	Units	60358561003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.29	2.5	2.5	2.1	1.8	72	62	80-120	12	15	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

QC Batch: 699123
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358712001

METHOD BLANK: 2820088 Matrix: Water
Associated Lab Samples: 60358712001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.075	0.20	0.075	01/13/21 18:05	

METHOD BLANK: 2821871 Matrix: Water
Associated Lab Samples: 60358712001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.075	0.20	0.075	01/14/21 09:14	

METHOD BLANK: 2822618 Matrix: Water
Associated Lab Samples: 60358712001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.075	0.20	0.075	01/15/21 09:15	

LABORATORY CONTROL SAMPLE: 2820089

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	98	90-110	

LABORATORY CONTROL SAMPLE: 2821872

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	100	90-110	

LABORATORY CONTROL SAMPLE: 2822619

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	101	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2820090 2820091

Parameter	Units	60358710001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.48	2.5	2.5	3.0	3.0	99	100	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2820092 2820093

Parameter	Units	60358711001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	<0.075	2.5	2.5	2.2	2.0	89	81	80-120	10	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2820094 2820095

Parameter	Units	60358712001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.42	2.5	2.5	3.0	2.8	104	94	80-120	9	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC - VS
Pace Project No.: 60358712

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60358712001	**S-DG-2**	EPA 200.7	698992	EPA 200.7	699030
60358712002	**S-DG-3**	EPA 200.7	698992	EPA 200.7	699030
60358712003	**S-DG-4**	EPA 200.7	698992	EPA 200.7	699030
60358712004	**S-SCPC-FB-1**	EPA 200.7	698992	EPA 200.7	699030
60358712005	**S-SCPC-DUP-1**	EPA 200.7	698992	EPA 200.7	699030
60358712001	**S-DG-2**	SM 2540C	698754		
60358712003	**S-DG-4**	SM 2540C	698754		
60358712004	**S-SCPC-FB-1**	SM 2540C	698754		
60358712005	**S-SCPC-DUP-1**	SM 2540C	698754		
60358712001	**S-DG-2**	EPA 300.0	699123		
60358712003	**S-DG-4**	EPA 300.0	698910		
60358712004	**S-SCPC-FB-1**	EPA 300.0	698910		
60358712005	**S-SCPC-DUP-1**	EPA 300.0	698910		

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Sample Condition Upon Receipt

WO#: 60358712

60358712

Client Name: Golder Associates

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☑ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ 2PCC

Thermometer Used: T-298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.2 **Corr. Factor** -0.2 **Corrected** 1.0 °C

Temperature should be above freezing to 6°C 1.6 1.4 °C

Date and initials of person examining contents: 1-9-21 KS

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# 603173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution _____

REVIEWED
By jchurch at 9:12 am, 1/11/21

Project Manager Review _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren - SCPC - VS
Project Number:	153140602

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
	WP
	AR
	OT
	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Boron	200.7 Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	S-D6-2	WT	G			11/8/21	1015		2	1		1						N	/		/		/			40358712
2	S-D6-3	WT	G			"	1118		1			1						N	/							
3	S-D6-4	WT	G			"	1220		2	1		1						N	/		/		/			
4	S-SCPC-FB-1	WT	G			"	1025		2	1		1						N	/		/		/			
5	S-SCPC-DUP-1	WT	G			"	—		2	1		1						N	/		/		/			
6	S-SCPC-MSD-1	WT	G			"	1015		2	1		1						N	/		/		/			
7	S-SCPC-MS-1	WT	G			"	1015		2	1		1						N	/		/		/			
8		WT	G																							
9		WT	G																							
10		WT	G																							
11		WT	G																							
12		WT	G																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[illegible]/Golder	1/8/21	~~1550~~	Angela McManus	1/8/21	1600				
	Angela McManus	1/8/21	1600	Davidson Pace	1/9/21	0400	1.0	Y	Y	Y
							1.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 01/08/21

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

MEMORANDUM

DATE January 27, 2021 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPC – VERIFICATION SAMPLING - DATA PACKAGE 60358712

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- When matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J), biased high (J+) or biased low (J-).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J. Ingram
Project Name: Ameren- Sioux - SCPC
Project Number: 153140602
Reviewer: A. Muehlfarth
Validation Date: 01/27/2021

Laboratory: Pace Analytical Services - Kansas City
SDG #: 60358712
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-DG-2, S-DG-3, S-DG-4, S-SCPC-FB-1, S-SCPC-DUP-1

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			01/08/2021
b) Sampling team indicated?	x			EMS/BTT
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, S.Cond., Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies: _____

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?		x		
g) Were any matrix problems noted?	x			See Notes

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☐	☒	☐	S-SCPC-FB-1 @ S-DG-2
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	☒	☐	☐	
b) Were the proper analytes included in the LCS?	☒	☐	☐	
c) Was the LCS accuracy criteria met?	☒	☐	☐	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	S-SCPC-DUP-1 @ S-DG-4
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	Max RPD: 4.4% (<20%)
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	Max RPD: 2% (<10%)

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	☐	☒	☐	
b) Was the %D within control limits?	☐	☐	☒	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Comments/Notes:

MS/MSD:

2819745/2819746: MSD % recovery low (<30%) for Calcium. Associated with sample 60358712001.

2819502/2819503: MS/MSD % recovery low for Fluoride. MS/MSD performed on unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-DG-2	Calcium	141000	J-	MSD % recovery low (<30%)

Signature: Ann Muhlfeith Date: 01/27/2021

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July 06, 2021

Jeffrey Ingram
Golder Associates
13515 Barrett Parkway Drive
Suite 260
Ballwin, MO 63021

RE: Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between April 14, 2021 and April 15, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Kansas City

REV-1, 7/6/21: S-BMW-1S and S-BMW-3S added per client request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Ryan Feldmann, Golder
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates
Brendan Talbert, Golder Associates

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CERTIFICATIONS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60366586001	**S-UG-2**	Water	04/13/21 15:25	04/14/21 03:50
60366586002	**S-UG-1A**	Water	04/14/21 15:47	04/15/21 04:40
60366586003	**S-DG-3**	Water	04/14/21 12:13	04/15/21 04:40
60366586004	**S-DG-1**	Water	04/14/21 14:58	04/15/21 04:40
60366586005	**S-DG-2**	Water	04/14/21 13:00	04/15/21 04:40
60366586006	**S-DG-4**	Water	04/14/21 10:23	04/15/21 04:40
60366586007	**S-SCPC-DUP-1**	Water	04/14/21 00:00	04/15/21 04:40
60366586008	**S-SCPC-FB-1**	Water	04/14/21 12:25	04/15/21 04:40
60366138009	**S-BMW-1S**	Water	04/13/21 13:35	04/14/21 03:50
60366138010	**S-BMW-3S**	Water	04/13/21 12:17	04/14/21 03:50

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SAMPLE ANALYTE COUNT

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60366586001	S-UG-2	EPA 200.7	JLH, TDS	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366586002	S-UG-1A	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366586003	S-DG-3	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366586004	S-DG-1	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366586005	S-DG-2	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366586006	S-DG-4	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366586007	S-SCPC-DUP-1	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366586008	S-SCPC-FB-1	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366138009	S-BMW-1S	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366138010	S-BMW-3S	EPA 200.7	JLH	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	MAP	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-UG-2 **Lab ID: 60366586001** Collected: 04/13/21 15:25 Received: 04/14/21 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**120**	ug/L	100	8.6	1	04/20/21 10:23	04/26/21 19:37	7440-42-8	
Calcium	**80500**	ug/L	200	75.4	1	04/20/21 10:23	04/26/21 19:37	7440-70-2	M1
Iron	**104**	ug/L	50.0	21.4	1	04/20/21 10:23	04/26/21 19:37	7439-89-6	
Magnesium	**17800**	ug/L	50.0	31.4	1	04/20/21 10:23	04/26/21 19:37	7439-95-4	
Manganese	**38.9**	ug/L	5.0	0.74	1	04/20/21 10:23	04/26/21 19:37	7439-96-5	
Potassium	**3310**	ug/L	500	146	1	04/20/21 10:23	04/26/21 19:37	7440-09-7	
Sodium	**5420**	ug/L	500	254	1	04/20/21 10:23	04/27/21 11:22	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**257**	mg/L	20.0	7.5	1		04/22/21 19:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**373**	mg/L	5.0	5.0	1		04/20/21 12:48		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.3**	mg/L	1.0	0.39	1		04/21/21 23:22	16887-00-6	
Fluoride	**0.28**	mg/L	0.20	0.086	1		04/21/21 23:22	16984-48-8	D6
Sulfate	**70.6**	mg/L	5.0	2.1	5		04/22/21 00:25	14808-79-8	R1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-UG-1A **Lab ID: 60366586002** Collected: 04/14/21 15:47 Received: 04/15/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**146**	ug/L	100	8.6	1	04/19/21 09:05	04/20/21 16:23	7440-42-8	
Calcium	**146000**	ug/L	200	75.4	1	04/19/21 09:05	04/20/21 16:23	7440-70-2	M1
Iron	**<21.4**	ug/L	50.0	21.4	1	04/19/21 09:05	04/20/21 16:23	7439-89-6	
Magnesium	**34500**	ug/L	50.0	31.4	1	04/19/21 09:05	04/20/21 16:23	7439-95-4	
Manganese	**63.7**	ug/L	5.0	0.74	1	04/19/21 09:05	04/20/21 16:23	7439-96-5	
Potassium	**7900**	ug/L	500	146	1	04/19/21 09:05	04/20/21 16:23	7440-09-7	
Sodium	**32600**	ug/L	500	254	1	04/19/21 09:05	04/20/21 16:23	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**403**	mg/L	20.0	7.5	1		04/19/21 13:16		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**719**	mg/L	10.0	10.0	1		04/21/21 14:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**90.1**	mg/L	10.0	3.9	10		04/19/21 14:12	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	0.086	1		04/19/21 13:29	16984-48-8	
Sulfate	**55.4**	mg/L	10.0	4.2	10		04/19/21 14:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-DG-3 **Lab ID: 60366586003** Collected: 04/14/21 12:13 Received: 04/15/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**92.6J**	ug/L	100	8.6	1	04/19/21 09:05	04/20/21 16:26	7440-42-8	
Calcium	**143000**	ug/L	200	75.4	1	04/19/21 09:05	04/20/21 16:26	7440-70-2	
Iron	**2840**	ug/L	50.0	21.4	1	04/19/21 09:05	04/20/21 16:26	7439-89-6	
Magnesium	**29100**	ug/L	50.0	31.4	1	04/19/21 09:05	04/20/21 16:26	7439-95-4	
Manganese	**754**	ug/L	5.0	0.74	1	04/19/21 09:05	04/20/21 16:26	7439-96-5	
Potassium	**5030**	ug/L	500	146	1	04/19/21 09:05	04/20/21 16:26	7440-09-7	
Sodium	**4470**	ug/L	500	254	1	04/19/21 09:05	04/20/21 16:26	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**405**	mg/L	20.0	7.5	1		04/19/21 13:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**535**	mg/L	10.0	10.0	1		04/21/21 14:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**5.9**	mg/L	1.0	0.39	1		04/19/21 14:26	16887-00-6	
Fluoride	**0.36**	mg/L	0.20	0.086	1		04/19/21 14:26	16984-48-8	
Sulfate	**60.9**	mg/L	5.0	2.1	5		04/19/21 14:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-DG-1 **Lab ID: 60366586004** Collected: 04/14/21 14:58 Received: 04/15/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**103**	ug/L	100	8.6	1	04/19/21 09:05	04/20/21 16:28	7440-42-8	
Calcium	**135000**	ug/L	200	75.4	1	04/19/21 09:05	04/20/21 16:28	7440-70-2	
Iron	**3790**	ug/L	50.0	21.4	1	04/19/21 09:05	04/20/21 16:28	7439-89-6	
Magnesium	**29600**	ug/L	50.0	31.4	1	04/19/21 09:05	04/20/21 16:28	7439-95-4	
Manganese	**471**	ug/L	5.0	0.74	1	04/19/21 09:05	04/20/21 16:28	7439-96-5	
Potassium	**5770**	ug/L	500	146	1	04/19/21 09:05	04/20/21 16:28	7440-09-7	
Sodium	**4820**	ug/L	500	254	1	04/19/21 09:05	04/20/21 16:28	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**417**	mg/L	20.0	7.5	1		04/19/21 13:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**533**	mg/L	10.0	10.0	1		04/21/21 14:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**8.6**	mg/L	1.0	0.39	1		04/19/21 14:55	16887-00-6	
Fluoride	**0.30**	mg/L	0.20	0.086	1		04/19/21 14:55	16984-48-8	
Sulfate	**52.0**	mg/L	5.0	2.1	5		04/19/21 15:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-DG-2 **Lab ID: 60366586005** Collected: 04/14/21 13:00 Received: 04/15/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**98.5J**	ug/L	100	8.6	1	04/19/21 09:05	04/20/21 16:33	7440-42-8	
Calcium	**135000**	ug/L	200	75.4	1	04/19/21 09:05	04/20/21 16:33	7440-70-2	
Iron	**164**	ug/L	50.0	21.4	1	04/19/21 09:05	04/20/21 16:33	7439-89-6	
Magnesium	**28800**	ug/L	50.0	31.4	1	04/19/21 09:05	04/20/21 16:33	7439-95-4	
Manganese	**388**	ug/L	5.0	0.74	1	04/19/21 09:05	04/20/21 16:33	7439-96-5	
Potassium	**6040**	ug/L	500	146	1	04/19/21 09:05	04/20/21 16:33	7440-09-7	
Sodium	**5060**	ug/L	500	254	1	04/19/21 09:05	04/20/21 16:33	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**413**	mg/L	20.0	7.5	1		04/19/21 13:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**522**	mg/L	10.0	10.0	1		04/21/21 14:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**7.5**	mg/L	1.0	0.39	1		04/19/21 15:24	16887-00-6	
Fluoride	**0.38**	mg/L	0.20	0.086	1		04/19/21 15:24	16984-48-8	
Sulfate	**35.4**	mg/L	5.0	2.1	5		04/19/21 15:38	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-DG-4 **Lab ID: 60366586006** Collected: 04/14/21 10:23 Received: 04/15/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**87.5J**	ug/L	100	8.6	1	04/19/21 09:05	04/20/21 16:36	7440-42-8	
Calcium	**154000**	ug/L	200	75.4	1	04/19/21 09:05	04/20/21 16:36	7440-70-2	
Iron	**32.8J**	ug/L	50.0	21.4	1	04/19/21 09:05	04/20/21 16:36	7439-89-6	
Magnesium	**46600**	ug/L	50.0	31.4	1	04/19/21 09:05	04/20/21 16:36	7439-95-4	
Manganese	**212**	ug/L	5.0	0.74	1	04/19/21 09:05	04/20/21 16:36	7439-96-5	
Potassium	**7060**	ug/L	500	146	1	04/19/21 09:05	04/20/21 16:36	7440-09-7	
Sodium	**20800**	ug/L	500	254	1	04/19/21 09:05	04/20/21 16:36	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**426**	mg/L	20.0	7.5	1		04/19/21 13:51		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**808**	mg/L	10.0	10.0	1		04/21/21 14:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**95.3**	mg/L	10.0	3.9	10		04/19/21 16:21	16887-00-6	
Fluoride	**0.34**	mg/L	0.20	0.086	1		04/19/21 15:52	16984-48-8	
Sulfate	**51.1**	mg/L	10.0	4.2	10		04/19/21 16:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-SCPC-DUP-1 **Lab ID: 60366586007** Collected: 04/14/21 00:00 Received: 04/15/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**85.4J**	ug/L	100	8.6	1	04/19/21 09:05	04/20/21 16:38	7440-42-8	
Calcium	**151000**	ug/L	200	75.4	1	04/19/21 09:05	04/20/21 16:38	7440-70-2	
Iron	**31.7J**	ug/L	50.0	21.4	1	04/19/21 09:05	04/20/21 16:38	7439-89-6	
Magnesium	**45500**	ug/L	50.0	31.4	1	04/19/21 09:05	04/20/21 16:38	7439-95-4	
Manganese	**195**	ug/L	5.0	0.74	1	04/19/21 09:05	04/20/21 16:38	7439-96-5	
Potassium	**6940**	ug/L	500	146	1	04/19/21 09:05	04/20/21 16:38	7440-09-7	
Sodium	**20400**	ug/L	500	254	1	04/19/21 09:05	04/20/21 16:38	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**429**	mg/L	20.0	7.5	1		04/19/21 14:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**751**	mg/L	10.0	10.0	1		04/21/21 14:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**98.8**	mg/L	5.0	1.9	5		04/19/21 17:33	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		04/19/21 17:18	16984-48-8	
Sulfate	**49.6**	mg/L	5.0	2.1	5		04/19/21 17:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-SCPC-FB-1 **Lab ID: 60366586008** Collected: 04/14/21 12:25 Received: 04/15/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**<8.6**	ug/L	100	8.6	1	04/19/21 09:05	04/20/21 16:49	7440-42-8	
Calcium	**<75.4**	ug/L	200	75.4	1	04/19/21 09:05	04/20/21 16:49	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	04/19/21 09:05	04/20/21 16:49	7439-89-6	
Magnesium	**<31.4**	ug/L	50.0	31.4	1	04/19/21 09:05	04/20/21 16:49	7439-95-4	
Manganese	**<0.74**	ug/L	5.0	0.74	1	04/19/21 09:05	04/20/21 16:49	7439-96-5	
Potassium	**<146**	ug/L	500	146	1	04/19/21 09:05	04/20/21 16:49	7440-09-7	
Sodium	**<254**	ug/L	500	254	1	04/19/21 09:05	04/20/21 16:49	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<7.5**	mg/L	20.0	7.5	1		04/19/21 14:07		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		04/21/21 14:06		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**<0.39**	mg/L	1.0	0.39	1		04/19/21 17:47	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		04/19/21 17:47	16984-48-8	
Sulfate	**<0.42**	mg/L	1.0	0.42	1		04/19/21 17:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-BMW-1S **Lab ID: 60366138009** Collected: 04/13/21 13:35 Received: 04/14/21 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**70.8J**	ug/L	100	8.6	1	04/22/21 11:30	04/30/21 23:41	7440-42-8	
Calcium	**149000**	ug/L	200	75.4	1	04/22/21 11:30	04/30/21 23:41	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	04/22/21 11:30	04/30/21 23:41	7439-89-6	
Magnesium	**28500**	ug/L	50.0	31.4	1	04/22/21 11:30	04/30/21 23:41	7439-95-4	
Manganese	**393**	ug/L	5.0	0.74	1	04/22/21 11:30	04/30/21 23:41	7439-96-5	
Potassium	**397J**	ug/L	500	146	1	04/22/21 11:30	04/30/21 23:41	7440-09-7	
Sodium	**4750**	ug/L	500	254	1	04/22/21 11:30	04/30/21 23:41	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**450**	mg/L	20.0	7.5	1		04/22/21 19:06		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**579**	mg/L	10.0	10.0	1		04/20/21 12:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**8.2**	mg/L	1.0	0.39	1		04/24/21 02:37	16887-00-6	
Fluoride	**0.36**	mg/L	0.20	0.086	1		04/24/21 02:37	16984-48-8	
Sulfate	**29.4**	mg/L	5.0	2.1	5		04/24/21 02:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Sample: S-BMW-3S **Lab ID: 60366138010** Collected: 04/13/21 12:17 Received: 04/14/21 03:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**74.2J**	ug/L	100	8.6	1	04/22/21 11:30	04/30/21 23:43	7440-42-8	
Calcium	**134000**	ug/L	200	75.4	1	04/22/21 11:30	04/30/21 23:43	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	04/22/21 11:30	04/30/21 23:43	7439-89-6	
Magnesium	**23800**	ug/L	50.0	31.4	1	04/22/21 11:30	04/30/21 23:43	7439-95-4	
Manganese	**161**	ug/L	5.0	0.74	1	04/22/21 11:30	04/30/21 23:43	7439-96-5	
Potassium	**520**	ug/L	500	146	1	04/22/21 11:30	04/30/21 23:43	7440-09-7	
Sodium	**5470**	ug/L	500	254	1	04/22/21 11:30	04/30/21 23:43	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**399**	mg/L	20.0	7.5	1		04/22/21 19:12		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**509**	mg/L	10.0	10.0	1		04/20/21 12:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**12.8**	mg/L	1.0	0.39	1		04/24/21 03:09	16887-00-6	
Fluoride	**0.39**	mg/L	0.20	0.086	1		04/24/21 03:09	16984-48-8	
Sulfate	**34.8**	mg/L	2.0	0.84	2		04/24/21 03:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715283
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007, 60366586008

METHOD BLANK: 2878023 Matrix: Water
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007, 60366586008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	04/20/21 16:03	
Calcium	ug/L	<75.4	200	75.4	04/20/21 16:03	
Iron	ug/L	<21.4	50.0	21.4	04/20/21 16:03	
Magnesium	ug/L	<31.4	50.0	31.4	04/20/21 16:03	
Manganese	ug/L	<0.74	5.0	0.74	04/20/21 16:03	
Potassium	ug/L	<146	500	146	04/20/21 16:03	
Sodium	ug/L	<254	500	254	04/20/21 16:03	

LABORATORY CONTROL SAMPLE: 2878024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	980	98	85-115	
Calcium	ug/L	10000	9920	99	85-115	
Iron	ug/L	10000	10100	101	85-115	
Magnesium	ug/L	10000	9940	99	85-115	
Manganese	ug/L	1000	972	97	85-115	
Potassium	ug/L	10000	9810	98	85-115	
Sodium	ug/L	10000	9940	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878025 2878026

Parameter	Units	60366586002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	146	1000	1000	1120	1160	97	101	70-130	4	20	
Calcium	ug/L	146000	10000	10000	151000	162000	53	167	70-130	7	20	M1
Iron	ug/L	<21.4	10000	10000	9720	10200	97	102	70-130	5	20	
Magnesium	ug/L	34500	10000	10000	43200	46300	87	118	70-130	7	20	
Manganese	ug/L	63.7	1000	1000	995	1040	93	98	70-130	4	20	
Potassium	ug/L	7900	10000	10000	17400	18400	95	106	70-130	6	20	
Sodium	ug/L	32600	10000	10000	41400	44500	89	120	70-130	7	20	

MATRIX SPIKE SAMPLE: 2878027

Parameter	Units	60366586004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	103	1000	1100	100	70-130	
Calcium	ug/L	135000	10000	146000	114	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

MATRIX SPIKE SAMPLE: 2878027

Parameter	Units	60366586004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	3790	10000	13800	100	70-130	
Magnesium	ug/L	29600	10000	39800	101	70-130	
Manganese	ug/L	471	1000	1440	97	70-130	
Potassium	ug/L	5770	10000	15900	101	70-130	
Sodium	ug/L	4820	10000	15000	101	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715667
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366586001

METHOD BLANK: 2879100 Matrix: Water
Associated Lab Samples: 60366586001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	04/26/21 19:16	
Calcium	ug/L	<75.4	200	75.4	04/26/21 19:16	
Iron	ug/L	<21.4	50.0	21.4	04/26/21 19:16	
Magnesium	ug/L	<31.4	50.0	31.4	04/26/21 19:16	
Manganese	ug/L	<0.74	5.0	0.74	04/26/21 19:16	
Potassium	ug/L	180J	500	146	04/26/21 19:16	
Sodium	ug/L	<254	500	254	04/27/21 11:19	

LABORATORY CONTROL SAMPLE: 2879101

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	920	92	85-115	
Calcium	ug/L	10000	9740	97	85-115	
Iron	ug/L	10000	9950	99	85-115	
Magnesium	ug/L	10000	9480	95	85-115	
Manganese	ug/L	1000	920	92	85-115	
Potassium	ug/L	10000	9400	94	85-115	
Sodium	ug/L	10000	11100	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2879102 2879103

Parameter	Units	60366586001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	120	1000	1000	1050	1050	93	93	70-130	0	20	
Calcium	ug/L	80500	10000	10000	93800	92700	132	122	70-130	1	20	M1
Iron	ug/L	104	10000	10000	9490	9480	94	94	70-130	0	20	
Magnesium	ug/L	17800	10000	10000	27800	27400	100	96	70-130	1	20	
Manganese	ug/L	38.9	1000	1000	922	923	88	88	70-130	0	20	
Potassium	ug/L	3310	10000	10000	12500	12400	92	91	70-130	1	20	
Sodium	ug/L	5420	10000	10000	15400	15200	100	98	70-130	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2879104 2879127

Parameter	Units	60366588003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	75.8J	1000	1000	1010	987	94	91	70-130	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2879104 2879127

Parameter	Units	60366588003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	114000	10000	10000	125000	121000	106	66	70-130	3	20	M1
Iron	ug/L	142	10000	10000	9660	9400	95	93	70-130	3	20	
Magnesium	ug/L	20700	10000	10000	29700	28900	91	82	70-130	3	20	
Manganese	ug/L	112	1000	1000	990	964	88	85	70-130	3	20	
Potassium	ug/L	5230	10000	10000	14400	14200	91	89	70-130	1	20	
Sodium	ug/L	4110	10000	10000	14000	13600	98	95	70-130	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 716201
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366138009, 60366138010

METHOD BLANK: 2881020 Matrix: Water
Associated Lab Samples: 60366138009, 60366138010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	04/30/21 23:10	
Calcium	ug/L	<75.4	200	75.4	04/30/21 23:10	
Iron	ug/L	<21.4	50.0	21.4	04/30/21 23:10	
Magnesium	ug/L	<31.4	50.0	31.4	04/30/21 23:10	
Manganese	ug/L	<0.74	5.0	0.74	04/30/21 23:10	
Potassium	ug/L	<146	500	146	04/30/21 23:10	
Sodium	ug/L	<254	500	254	05/07/21 07:17	

LABORATORY CONTROL SAMPLE: 2881021

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	988	99	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Iron	ug/L	10000	10100	101	85-115	
Magnesium	ug/L	10000	9920	99	85-115	
Manganese	ug/L	1000	984	98	85-115	
Potassium	ug/L	10000	10200	102	85-115	
Sodium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2881022 2881023

Parameter	Units	60366138006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	10400	1000	1000	11200	11000	78	50	70-130	3	20	M1
Calcium	ug/L	199000	10000	10000	215000	209000	166	105	70-130	3	20	M1
Iron	ug/L	45.0J	10000	10000	10000	9750	100	97	70-130	3	20	
Magnesium	ug/L	29400	10000	10000	40400	39200	110	98	70-130	3	20	
Manganese	ug/L	407	1000	1000	1390	1360	98	95	70-130	2	20	
Potassium	ug/L	9890	10000	10000	20700	20200	108	104	70-130	2	20	
Sodium	ug/L	70800	10000	10000	81200	78600	103	78	70-130	3	20	

MATRIX SPIKE SAMPLE: 2881024

Parameter	Units	60366138014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	6000	1000	7050	105	70-130	
Calcium	ug/L	144000	10000	153000	81	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

MATRIX SPIKE SAMPLE: 2881024

Parameter	Units	60366138014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	9430	10000	18900	95	70-130	
Magnesium	ug/L	35300	10000	45500	102	70-130	
Manganese	ug/L	1130	1000	2140	102	70-130	
Potassium	ug/L	5020	10000	15700	107	70-130	
Sodium	ug/L	22600	10000	32700	101	70-130	

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715392 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007, 60366586008

METHOD BLANK: 2878406 Matrix: Water
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007, 60366586008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.5	20.0	7.5	04/19/21 11:53	

LABORATORY CONTROL SAMPLE: 2878407

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	501	100	90-110	

SAMPLE DUPLICATE: 2878408

Parameter	Units	60366498001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	1280	1320	3	10	

SAMPLE DUPLICATE: 2878409

Parameter	Units	60366586006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	426	435	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 716345 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366138009, 60366138010, 60366586001

METHOD BLANK: 2881690 Matrix: Water
Associated Lab Samples: 60366138009, 60366138010, 60366586001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.5	20.0	7.5	04/22/21 17:58	

LABORATORY CONTROL SAMPLE: 2881691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	511	102	90-110	

SAMPLE DUPLICATE: 2881692

Parameter	Units	60366511001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	133	129	3	10	

SAMPLE DUPLICATE: 2881693

Parameter	Units	60366586001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	257	263	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715646
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366138009, 60366138010, 60366586001

METHOD BLANK: 2879035 Matrix: Water
Associated Lab Samples: 60366138009, 60366138010, 60366586001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/20/21 12:46	

LABORATORY CONTROL SAMPLE: 2879036

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2879037

Parameter	Units	60366586001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	373	376	1	10	

SAMPLE DUPLICATE: 2879038

Parameter	Units	60366588003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	445	437	2	10	

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REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715937 — Analysis Method: SM 2540C
QC Batch Method: SM 2540C — Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007

METHOD BLANK: 2880011 — Matrix: Water
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/21/21 14:01	

LABORATORY CONTROL SAMPLE: 2880012

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	990	99	80-120	

SAMPLE DUPLICATE: 2880013

Parameter	Units	60366724005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1680	1540	8	10	

SAMPLE DUPLICATE: 2880014

Parameter	Units	60366138022 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1010	1070	6	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715938
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366586008

METHOD BLANK: 2880019 Matrix: Water
Associated Lab Samples: 60366586008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/21/21 14:06	

LABORATORY CONTROL SAMPLE: 2880020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 2880021

Parameter	Units	60366586008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	<5.0	<5.0		10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715327
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007, 60366586008

METHOD BLANK: 2878144 Matrix: Water
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007, 60366586008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/19/21 09:31	
Fluoride	mg/L	<0.086	0.20	0.086	04/19/21 09:31	
Sulfate	mg/L	<0.42	1.0	0.42	04/19/21 09:31	

METHOD BLANK: 2880162 Matrix: Water
Associated Lab Samples: 60366586002, 60366586003, 60366586004, 60366586005, 60366586006, 60366586007, 60366586008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/20/21 07:53	
Fluoride	mg/L	<0.086	0.20	0.086	04/20/21 07:53	
Sulfate	mg/L	<0.42	1.0	0.42	04/20/21 07:53	

LABORATORY CONTROL SAMPLE: 2878145

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	101	90-110	
Fluoride	mg/L	2.5	2.3	91	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

LABORATORY CONTROL SAMPLE: 2880163

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878146 2878147

Parameter	Units	60366692007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	1000	1000	1040	1340	104	134	80-120	25	15	M1,R1
Fluoride	mg/L	ND	500	500	477	630	95	126	80-120	28	15	M1,R1
Sulfate	mg/L	426	1000	1000	1430	1780	100	136	80-120	22	15	M1,R1

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

MATRIX SPIKE SAMPLE: 2878148

Parameter	Units	60366586006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	95.3	50	143	95	80-120	
Fluoride	mg/L	0.34	2.5	2.6	91	80-120	
Sulfate	mg/L	51.1	50	97.4	93	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 715726
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60366586001

METHOD BLANK: 2879432 Matrix: Water
Associated Lab Samples: 60366586001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/21/21 15:58	
Fluoride	mg/L	<0.086	0.20	0.086	04/21/21 15:58	
Sulfate	mg/L	<0.42	1.0	0.42	04/21/21 15:58	

METHOD BLANK: 2882319 Matrix: Water
Associated Lab Samples: 60366586001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/22/21 09:08	
Fluoride	mg/L	<0.086	0.20	0.086	04/22/21 09:08	
Sulfate	mg/L	<0.42	1.0	0.42	04/22/21 09:08	

LABORATORY CONTROL SAMPLE: 2879433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

LABORATORY CONTROL SAMPLE: 2882320

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	90-110	
Sulfate	mg/L	5	4.6	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2879434 2879435

Parameter	Units	60366957002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.7	5	5	6.3	6.5	92	96	80-120	3	15	
Fluoride	mg/L	0.91			3.2	3.4				5	15	
Sulfate	mg/L	2.0	5	5	7.0	7.2	100	104	80-120	3	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2879434 2881092

Parameter	Units	60366957002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.7	5	5	6.3	6.9	92	94	80-120	10	15	
Fluoride	mg/L	0.91		2.5	3.2	2.9		103		12	15	
Sulfate	mg/L	2.0	5	25	7.0	97.5	100	108	80-120	173	15	R1

MATRIX SPIKE SAMPLE: 2879436

Parameter	Units	60366227002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	41.5	50	87.8	93	80-120	
Fluoride	mg/L	0.32	2.5	2.9	102	80-120	
Sulfate	mg/L	33.2	50	81.4	96	80-120	

MATRIX SPIKE SAMPLE: 2881093

Parameter	Units	60366586001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	2.3	5	7.0	96	80-120	
Fluoride	mg/L	0.28	2.5	2.9	106	80-120	
Sulfate	mg/L	70.6	25	95.4	99	80-120	

SAMPLE DUPLICATE: 2880018

Parameter	Units	60366586001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	2.3	2.3	0	15	
Fluoride	mg/L	0.28	0.22	26	15	D6
Sulfate	mg/L	70.6	68.4	3	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

QC Batch: 716443
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366138009, 60366138010

METHOD BLANK: 2882108 Matrix: Water
Associated Lab Samples: 60366138009, 60366138010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/23/21 16:46	
Fluoride	mg/L	<0.086	0.20	0.086	04/23/21 16:46	
Sulfate	mg/L	<0.42	1.0	0.42	04/23/21 16:46	

METHOD BLANK: 2883765 Matrix: Water
Associated Lab Samples: 60366138009, 60366138010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/25/21 10:02	
Fluoride	mg/L	<0.086	0.20	0.086	04/25/21 10:02	
Sulfate	mg/L	<0.42	1.0	0.42	04/25/21 10:02	

LABORATORY CONTROL SAMPLE: 2882109

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

LABORATORY CONTROL SAMPLE: 2883766

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	
Fluoride	mg/L	2.5	2.3	91	90-110	
Sulfate	mg/L	5	4.7	94	90-110	

MATRIX SPIKE SAMPLE: 2882112

Parameter	Units	60366138002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	15.6	25	39.4	95	80-120	
Fluoride	mg/L	0.33	2.5	2.9	102	80-120	
Sulfate	mg/L	65.8	25	94.2	113	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2882113 2882114

Parameter	Units	60367128001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	10000	10000	15200	11400	152	114	80-120	28	15	M1,R1
Fluoride	mg/L	ND	5000	5000	7840	5920	157	118	80-120	28	15	M1,R1
Sulfate	mg/L	69000	50000	50000	114000	114000	90	91	80-120	0	15	

SAMPLE DUPLICATE: 2882115

Parameter	Units	60367128001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	ND	<778		15	
Fluoride	mg/L	ND	<173		15	
Sulfate	mg/L	69000	65200	6	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SEC SCPC
Pace Project No.: 60366586

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60366138009	S-BMW-1S	EPA 200.7	716201	EPA 200.7	716306
60366138010	S-BMW-3S	EPA 200.7	716201	EPA 200.7	716306
60366586001	S-UG-2	EPA 200.7	715667	EPA 200.7	715766
60366586002	S-UG-1A	EPA 200.7	715283	EPA 200.7	715444
60366586003	S-DG-3	EPA 200.7	715283	EPA 200.7	715444
60366586004	S-DG-1	EPA 200.7	715283	EPA 200.7	715444
60366586005	S-DG-2	EPA 200.7	715283	EPA 200.7	715444
60366586006	S-DG-4	EPA 200.7	715283	EPA 200.7	715444
60366586007	S-SCPC-DUP-1	EPA 200.7	715283	EPA 200.7	715444
60366586008	S-SCPC-FB-1	EPA 200.7	715283	EPA 200.7	715444
60366138009	S-BMW-1S	SM 2320B	716345		
60366138010	S-BMW-3S	SM 2320B	716345		
60366586001	S-UG-2	SM 2320B	716345		
60366586002	S-UG-1A	SM 2320B	715392		
60366586003	S-DG-3	SM 2320B	715392		
60366586004	S-DG-1	SM 2320B	715392		
60366586005	S-DG-2	SM 2320B	715392		
60366586006	S-DG-4	SM 2320B	715392		
60366586007	S-SCPC-DUP-1	SM 2320B	715392		
60366586008	S-SCPC-FB-1	SM 2320B	715392		
60366138009	S-BMW-1S	SM 2540C	715646		
60366138010	S-BMW-3S	SM 2540C	715646		
60366586001	S-UG-2	SM 2540C	715646		
60366586002	S-UG-1A	SM 2540C	715937		
60366586003	S-DG-3	SM 2540C	715937		
60366586004	S-DG-1	SM 2540C	715937		
60366586005	S-DG-2	SM 2540C	715937		
60366586006	S-DG-4	SM 2540C	715937		
60366586007	S-SCPC-DUP-1	SM 2540C	715937		
60366586008	S-SCPC-FB-1	SM 2540C	715938		
60366138009	S-BMW-1S	EPA 300.0	716443		
60366138010	S-BMW-3S	EPA 300.0	716443		
60366586001	S-UG-2	EPA 300.0	715726		
60366586002	S-UG-1A	EPA 300.0	715327		
60366586003	S-DG-3	EPA 300.0	715327		
60366586004	S-DG-1	EPA 300.0	715327		
60366586005	S-DG-2	EPA 300.0	715327		
60366586006	S-DG-4	EPA 300.0	715327		
60366586007	S-SCPC-DUP-1	EPA 300.0	715327		
60366586008	S-SCPC-FB-1	EPA 300.0	715327		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO#: 60366586

60366586

Client Name: Golder & Associates

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☑ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ Ziploc

Thermometer Used: T298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 3.8 **Corr. Factor** 0.0 **Corrected** 3.8

Date and initials of person examining contents: 4/14/21 SM

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	Did not run any containers for S-Pamw-3L
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# L023173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution:

REVIEWED
By jchurch at 8:27 am, 4/15/21

Project Manager Review: _____ Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical™ www.pacelabs.com

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

- Company: Golder Associates
- Address: 13515 Barrett Parkway Dr., Ste 260, Ballwin, MO 63021
- Email To: jeffrey_ingram@golder.com
- Phone: 636-724-9191 Fax: 636-724-9323
- Requested Due Date/TAT: Standard

Section B Required Project Information:

- Report To: Jeffrey Ingram
- Copy To: Eric Schnieder, Ryan Feldman
- Purchase Order No.: COC #10
- Project Name: Ameren Sioux Energy Center SCPC
- Project Number: 153140602.0003D

Section C Invoice Information:

- Attention:
- Company Name: Golder Associates Inc
- Address:
- Pace Quote Reference:
- Pace Project Manager: Jamie Church
- Pace Profile #: 9285, line 3

REGULATORY AGENCY

- ☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
- ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
	WP
	AR
	OT
	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Chloride/Fluoride/Sulfate (N)	App III and Cat/An Metals (N)	Alkalinity (N)	TDS (N)	Residual Chlorine (Y/N)
1	S-UG-1A	WT	G																			
2	S-UG-2	WT	G			4/13/21	1525		2	1		1						X	X	X	X	
3	S-DG-1	WT	G																			
4	S-DG-2	WT	G																			
5	S-DG-4	WT	G																			
6	S-SCPC-DUP-1	WT	G																			
7	S-SCPC-FB-1	WT	G																			
8	S-SCPC-MS-1	WT	G			4/13/21	1525		2	1		1						X	X	X	X	
9	S-SCPC-MSD-1	WT	G			↓	1525		↓	↓		↓						↓	↓	↓	↓	
10	S-BMW-1S	WT	G			4/13/21	1335		↓	↓		↓						↓	↓	↓	↓	
11	S-BMW-3S	WT	G			↓	1217		↓	↓		↓						↓	↓	↓	↓	
12		WT	G																			

Pace Project No./ Lab I.D.: 60366586

ADDITIONAL COMMENTS: *App III and Cat/An Metals* - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
[signature] / Golder	4/13/21	1045	Angela McMahan	4/13	1700				
Angela Mc[signature]	4/13	1700	[signature] / Pace	4/14/21	0350	3.8	Y	Y	Y

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

- PRINT Name of SAMPLER: Eric Schn[signature]
- SIGNATURE of SAMPLER: [signature]
- DATE Signed (MM/DD/YY): 04/13/21

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

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Sample Condition Upon Receipt

WO# : 60366586

60366586

Client Name: Golder Associates

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☑ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ 2 PLC

Thermometer Used: T-298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.8 **Corr. Factor** 0.0 **Corrected** 0.8°C

Date and initials of person examining contents: 4-16-21 KO

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# 603173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

REVIEWED
By jchurch at 4:23 pm, 4/16/21

Project Manager Review: Date:

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Ryan Feldman
Purchase Order No.:	COC #10
Project Name:	Ameren Sioux Energy Center SCPC
Project Number:	153140602.0003D

Section C Invoice Information:

Attention:	
Company Name:	Golder Associates Inc
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285, line 3

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MO

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	S-UG-1A	WT	G			4/14/21	1542		2	1		1						N	N	N	N		60366586
2	~~S-UG-2~~ S-DG-3	WT	G			4/14/21	1213		2	1		1											
3	S-DG-1	WT	G			4/14/21	1458		2	1		1											
4	S-DG-2	WT	G				1300		2	1		1											
5	S-DG-4	WT	G				1023		2	1		1											
6	S-SCPC-DUP-1	WT	G				—		2	1		1											
7	S-SCPC-FB-1	WT	G				1225		2	1		1											
8	~~S-SCPC-MS-1~~	WT	G																				
9	~~S-SCPC-MSD-1~~	WT	G																				
10	~~S-BMW-1S~~	WT	G																				
11	~~S-BMW-3S~~	WT	G																				
12		WT	G																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
App III and Cat/An Metals - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B	Eric Golder	4/14/21	1800	K Davison Pace	4/15/21	0440	0.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schnieder

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 04/14/21

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

MEMORANDUM

DATE July 6, 2021 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, SIOUX – SCPC – DETECTION MONITORING - DATA PACKAGE 60366586REV1

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When duplicate criterion was not met, the associated sample result was qualified as an estimate (J for detects, UJ for non-detects).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates Inc.
Project Manager: J. Ingram
Project Name: Ameren -SEC - SCPC
Project Number: 153140603
Reviewer: A. Muehlfarth
Validation Date: 7/6/2021

Laboratory: Pace Analytical Services, LLC
SDG #: 60366586rev1
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2320B (Alkalinity); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-UG-2, S-UG-1A, S-DG-3, S-DG-1, S-DG-2, S-DG-4, S-SCPC-DUP-1, S-SCPC-FB-1, S-BMW-1S, S-BMW-3S

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			04/13/2021 - 04/14/2021
b) Sampling team indicated?	x			EMS/SMK
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turbidity
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies:

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			See Notes
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?	x			See Notes
g) Were any matrix problems noted?	x			See Notes

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	x			See Notes
b) Were analytes detected in the field blank(s)?		x		
c) Were analytes detected in the equipment blank(s)?			x	
d) Were analytes detected in the trip blank(s)?			x	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	x			
b) Were the proper analytes included in the LCS?	x			
c) Was the LCS accuracy criteria met?	x			

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	x			S-SCPC-DUP-1 @ S-DG-4
b) Were field dup. precision criteria met (note RPD)?		x		See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			
d) Were lab dup. precision criteria met (note RPD)?		x		See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?			x	
b) Was the %D within control limits?			x	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?		x		See Notes
Recovery could not be calculated since sample contained high concentration of analyte?			x	
b) Was MSD accuracy criteria met?		x		See Notes
Recovery could not be calculated since sample contained high concentration of analyte?			x	
c) Were MS/MSD precision criteria met?		x		See Notes

Comments/Notes:

The Sample Condition Upon Receipt form completed by the lab reported that they did not receive sample containers for S-BMW-3S.

A revised data packet was issued 7/6/2021 to add samples S-BMW-1S (-38009) and S-BMW-3S (-38010).

Chloride and Sulfate were diluted in multiple samples, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks:

2879100: Potassium (180J). Associated with sample -001. Sample result >PQL and 10x blank result, no qualification necessary.

Duplicates:

S-SCPC-DUP-1 @ S-DG-4: Fluoride detected in sample, non-detect in duplicate.

Laboratory Duplicate 2880018: DUP RPD exceeds limit (15%) for Fluoride (26%). Associated with sample -001.

MS/MSD:

2878025/2878026: MS % recovery low and MSD % recovery high from Calcium. Sample result >4x spike amount, no qualification necessary.

2879102/2879103: MS % recovery high for Calcium. Sample result >4x spike amount, no qualification necessary.

2879104/2879127: MSD % recovery low for Calcium. MS/MSD performed on unrelated sample, no qualification necessary.

2878146/2878147: MSD % recovery high and RPD exceeds limit (15%) for Chloride, Fluoride, and Sulfate. MS/MSD performed on unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-DG-4	Fluoride	0.34	J	Detected in sample, non-detect in duplicate
S-SCPC-DUP-1	Fluoride	0.086	UJ	"
S-UG-2	Fluoride	0.28	J	Lab DUP RPD exceeds limit

Signature: Ann Muhlfeith Date: 7/62021

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

June 18, 2021

Jeffrey Ingram
Golder Associates
13515 Barrett Parkway Drive
Suite 260
Ballwin, MO 63021

RE: Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on June 04, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Kansas City

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Ryan Feldmann, Golder
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates
Brendan Talbert, Golder Associates

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CERTIFICATIONS

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60371258001	**S-DG-3**	Water	06/02/21 12:02	06/04/21 04:25
60371258002	**S-DG-4**	Water	06/02/21 11:45	06/04/21 04:25
60371258003	**S-SCPC-FB-1**	Water	06/02/21 12:25	06/04/21 04:25
60371258004	**S-SCPC-DUP-1**	Water	06/02/21 08:00	06/04/21 04:25

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SAMPLE ANALYTE COUNT

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60371258001	**S-DG-3**	EPA 300.0	CRN2	1	PASI-K
60371258002	**S-DG-4**	EPA 200.7	JLH	1	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60371258003	**S-SCPC-FB-1**	EPA 200.7	JLH	1	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60371258004	**S-SCPC-DUP-1**	EPA 200.7	JLH	1	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Sample: S-DG-3 **Lab ID: 60371258001** Collected: 06/02/21 12:02 Received: 06/04/21 04:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**52.6**	mg/L	5.0	2.1	5		06/17/21 16:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Sample: S-DG-4 **Lab ID: 60371258002** Collected: 06/02/21 11:45 Received: 06/04/21 04:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**152000**	ug/L	200	75.4	1	06/11/21 16:09	06/14/21 15:06	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**753**	mg/L	10.0	10.0	1		06/08/21 08:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**52.2**	mg/L	10.0	4.2	10		06/16/21 22:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Sample: S-SCPC-FB-1 **Lab ID: 60371258003** Collected: 06/02/21 12:25 Received: 06/04/21 04:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**<75.4**	ug/L	200	75.4	1	06/11/21 16:09	06/14/21 15:13	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		06/08/21 08:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**<0.42**	mg/L	1.0	0.42	1		06/16/21 16:09	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Sample: S-SCPC-DUP-1 **Lab ID: 60371258004** Collected: 06/02/21 08:00 Received: 06/04/21 04:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**132000**	ug/L	200	75.4	1	06/11/21 16:09	06/14/21 15:16	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**512**	mg/L	10.0	10.0	1		06/08/21 08:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**52.9**	mg/L	5.0	2.1	5		06/16/21 16:21	14808-79-8	

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

QC Batch: 725898
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60371258002, 60371258003, 60371258004

METHOD BLANK: 2916937 Matrix: Water
Associated Lab Samples: 60371258002, 60371258003, 60371258004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Calcium	ug/L	<75.4	200	75.4	06/14/21 14:26	

LABORATORY CONTROL SAMPLE: 2916938

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	10000	9830	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2916939 2916940

Parameter	Units	60371252002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	202000	10000	10000	208000	218000	53	152	70-130	5	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2916941 2916942

Parameter	Units	60371255002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	252000	10000	10000	247000	256000	-46	40	70-130	3	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2916943 2916944

Parameter	Units	60371258002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	152000	10000	10000	163000	162000	106	97	70-130	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

QC Batch: 724737 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60371258002, 60371258003, 60371258004

METHOD BLANK: 2913066 Matrix: Water
Associated Lab Samples: 60371258002, 60371258003, 60371258004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/08/21 08:12	

LABORATORY CONTROL SAMPLE: 2913067

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	975	98	80-120	

SAMPLE DUPLICATE: 2913068

Parameter	Units	60371297001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1000	1050	5	10	

SAMPLE DUPLICATE: 2913069

Parameter	Units	60371258002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	753	778	3	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

QC Batch: 726410 — Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 — Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60371258001, 60371258003, 60371258004

METHOD BLANK: 2918610 — Matrix: Water
Associated Lab Samples: 60371258001, 60371258003, 60371258004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.42	1.0	0.42	06/16/21 12:20	

METHOD BLANK: 2921617 — Matrix: Water
Associated Lab Samples: 60371258001, 60371258003, 60371258004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.42	1.0	0.42	06/17/21 08:37	

LABORATORY CONTROL SAMPLE: 2918611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.7	95	90-110	

LABORATORY CONTROL SAMPLE: 2921618

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2918613 2918614

Parameter	Units	60371252002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	717	5	5	721	721	80	82	80-120	0	15	E

MATRIX SPIKE SAMPLE: 2918615

Parameter	Units	60371258001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	52.6	25	76.9	97	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

SAMPLE DUPLICATE: 2918612

Parameter	Units	60371252002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	717	718	0	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

QC Batch: 726576
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60371258002

METHOD BLANK: 2919147 Matrix: Water
Associated Lab Samples: 60371258002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.42	1.0	0.42	06/16/21 19:35	

METHOD BLANK: 2922023 Matrix: Water
Associated Lab Samples: 60371258002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.42	1.0	0.42	06/18/21 09:15	

LABORATORY CONTROL SAMPLE: 2919148

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.7	94	90-110	

LABORATORY CONTROL SAMPLE: 2922024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2919150 2919151

Parameter	Units	60371255002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	845	500	500	1360	1350	102	101	80-120	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2919152 2919153

Parameter	Units	60371258002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	52.2	50	50	99.1	99.4	94	94	80-120	0	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2919155 2919156

Parameter	Units	60371986003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	290	200	200	483	482	96	96	80-120	0	15	E

SAMPLE DUPLICATE: 2919149

Parameter	Units	60371255002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	845	842	0	15	

SAMPLE DUPLICATE: 2919154

Parameter	Units	60371258002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	52.2	49.7	5	15	

SAMPLE DUPLICATE: 2919157

Parameter	Units	60371986003 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	290	290	0	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN-VS-SCPC
Pace Project No.: 60371258

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60371258002	**S-DG-4**	EPA 200.7	725898	EPA 200.7	725984
60371258003	**S-SCPC-FB-1**	EPA 200.7	725898	EPA 200.7	725984
60371258004	**S-SCPC-DUP-1**	EPA 200.7	725898	EPA 200.7	725984
60371258002	**S-DG-4**	SM 2540C	724737		
60371258003	**S-SCPC-FB-1**	SM 2540C	724737		
60371258004	**S-SCPC-DUP-1**	SM 2540C	724737		
60371258001	**S-DG-3**	EPA 300.0	726410		
60371258002	**S-DG-4**	EPA 300.0	726576		
60371258003	**S-SCPC-FB-1**	EPA 300.0	726410		
60371258004	**S-SCPC-DUP-1**	EPA 300.0	726410		

Pace Analytical®
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60371258

60371258

Client Name: Golder Associates

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☒ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☒ Zplc

Thermometer Used: T298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.4 **Corr. Factor** 0.0 **Corrected** 1.4

Temperature should be above freezing to 6°C 2.0 2.0

Date and initials of person examining contents: 6/4/21 SRE

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# L603173	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution:

REVIEWED
By jchurch at 3:14 pm, 6/4/21

Project Manager Review: _____ Date: _____

Pace Analytical™ www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — **Required** Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B — **Required** Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Ryan Feldman, Brendan Talbert
Purchase Order No.:	COC #1
Project Name:	Ameren - Verification Sampling - SCPC
Project Number:	153140603.0003C

Section C — Invoice Information:

Attention:	
Company Name:	Golder Associates Inc
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285, line 1

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER ______

Site Location STATE: MO

Section D — Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

Requested Analysis Filtered (Y/N): N N N N N N N N N N

Pace Project No./ Lab I.D.: 60371258

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Chloride	Fluoride	Sulfate	TDS	Calcium	Boron		Residual Chlorine (Y/N)
1	S-DG-3	WT	G			6-2-21	1262		1	1										/				1-BP2U	
2	S-DG-4	WT	G			↓	1145		2	1		1									/	/		1-BP2U	1-BP3N
3	S-SCPC-FB-1	WT	G			↓	1225		2	1		1								/	/	/		↓	↓
4	S-SCPC-DUP-1	WT	G			↓	—		2	1		1								/	/	/		↓	↓
5	S-SCPC-MS-1	WT	G			↓	1145		2	1		1								/	/	/		↓	↓
6	S-SCPC-MSD-1	WT	G			↓	1145		2	1		1								/	/	/		↓	↓
7		WT	G																						
8		WT	G																						
9		WT	G																						
10		WT	G																						
11		WT	G																						
12		WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Brendan Talbert/Golder	6-3-21	1345	Angela McManus	6-3	1400				
	Angela MCM	6-3	1400	[illegible]/Pace	6/4/21	0425	1.4	Y	Y	Y
							2.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brendan Talbert

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 06/03/21

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

MEMORANDUM

DATE July 20, 2021 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Katie Bartels **EMAIL Kbartels@golder.com**

DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPC – VERIFICATION SAMPLING - DATA PACKAGE 60371258

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- None.

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J. Ingram
Project Name: Ameren- Sioux - SCPC
Project Number: 153140603
Reviewer: K. Bartels
Validation Date: 07/20/2021

Laboratory: Pace Analytical Services - Kansas City
SDG #: 60371258
Analytical Method (type and no.): EPA 300.0 (Anions), EPA 200.7 (Metals, Total), SM 2540C (TDS)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-DG-3, S-DG-4, S-SCPC-FB-1, S-SCPC-DUP-1

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			6/2/2021
b) Sampling team indicated?	x			BTT/SSS
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, S.Cond., Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies: _____

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?	x			See Notes
g) Were any matrix problems noted?	x			See Notes

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☐	☒	☐	S-SCPC-FB-1 @ S-DG-3
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	☒	☐	☐	
b) Were the proper analytes included in the LCS?	☒	☐	☐	
c) Was the LCS accuracy criteria met?	☒	☐	☐	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	S-SCPC-DUP-1 @ S-DG-3
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	RPD < 20%
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	☐	☒	☐	
b) Was the %D within control limits?	☐	☐	☒	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Comments/Notes:

Sulfate diluted in samples -001, -002, and -004, no qualification necessary.

MS/MSD:

2916941/2916942: MS/MSD % recovery low for Calcium. MS/MSD performed on unrelated sample, no qualification necessary.

2916939/2916940: MS % recovery low, MSD % recovery high for Calcium. MS/MSD performed on unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: _____ Date: 07/20/2021

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

December 28, 2021

Jeffrey Ingram
Golder Associates
701 Emerson Road, Suite 250
Saint Louis, MO 63141

RE: Project: AMEREN SCPC
Pace Project No.: 60385866

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between November 10, 2021 and November 12, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis
- Pace Analytical Services - Kansas City
- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Ryan Feldmann, Golder
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates
Brendan Talbert, Golder Associates

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: AMEREN SCPC
Pace Project No.: 60385866

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Indianapolis
7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
Wisconsin Laboratory #: 999788130
USDA Soil Permit #: P330-19-00257

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 2000302021-3
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: AMEREN SCPC
Pace Project No.: 60385866

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60385866001	**S-UG-2**	Water	11/09/21 12:02	11/10/21 05:17
60385866002	**S-UG-1A**	Water	11/10/21 10:15	11/12/21 04:32
60385866003	**S-DG-1**	Water	11/10/21 11:40	11/12/21 04:32
60385866004	**S-DG-2**	Water	11/10/21 12:35	11/12/21 04:32
60385866005	**S-DG-3**	Water	11/10/21 13:45	11/12/21 04:32
60385866006	**S-DG-4**	Water	11/10/21 14:55	11/12/21 04:32
60385866007	**S-SCPC-DUP-1**	Water	11/10/21 00:00	11/12/21 04:32
60385866008	**S-SCPC-FB-1**	Water	11/10/21 15:15	11/12/21 04:32
60385860001	**S-BMW-1S**	Water	11/08/21 14:41	11/10/21 05:17
60385860002	**S-BMW-3S**	Water	11/08/21 15:15	11/10/21 05:17

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60385866

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60385866001	**S-UG-2**	EPA 200.7	MA1	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
60385866002	**S-UG-1A**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385866003	**S-DG-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385866004	**S-DG-2**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385866005	**S-DG-3**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385866006	**S-DG-4**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385866007	**S-SCPC-DUP-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385866008	**S-SCPC-FB-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385860001	**S-BMW-1S**	EPA 200.7	MA1	7	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60385866

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60385860002	**S-BMW-3S**	EPA 300.0	MAW	3	PASI-K
		EPA 200.7	MA1	7	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MAW	3	PASI-K

PASI-I = Pace Analytical Services - Indianapolis
PASI-K = Pace Analytical Services - Kansas City
PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-UG-2 **Lab ID: 60385866001** Collected: 11/09/21 12:02 Received: 11/10/21 05:17 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**93.1J**	ug/L	100	8.6	1	11/28/21 09:06	11/30/21 15:49	7440-42-8	
Calcium	**96900**	ug/L	200	75.4	1	11/28/21 09:06	11/30/21 15:49	7440-70-2	M1
Iron	**<21.4**	ug/L	50.0	21.4	1	11/28/21 09:06	11/30/21 15:49	7439-89-6	
Magnesium	**21200**	ug/L	50.0	31.4	1	11/28/21 09:06	11/30/21 15:49	7439-95-4	
Manganese	**155**	ug/L	5.0	0.74	1	11/28/21 09:06	11/30/21 15:49	7439-96-5	
Potassium	**4490**	ug/L	500	146	1	11/28/21 09:06	11/30/21 15:49	7440-09-7	
Sodium	**41400**	ug/L	500	254	1	11/28/21 09:06	11/30/21 15:49	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**333**	mg/L	2.0	2.0	1		11/16/21 15:34		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**461**	mg/L	10.0	10.0	1		11/16/21 09:57		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**33.7**	mg/L	5.0	1.9	5		11/18/21 22:49	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.086	1		11/18/21 22:02	16984-48-8	
Sulfate	**41.7**	mg/L	5.0	2.1	5		11/20/21 18:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-UG-1A **Lab ID: 60385866002** Collected: 11/10/21 10:15 Received: 11/12/21 04:32 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**121**	ug/L	100	8.6	1	11/16/21 10:33	11/17/21 16:20	7440-42-8	
Calcium	**127000**	ug/L	200	75.4	1	11/16/21 10:33	11/18/21 16:22	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	11/16/21 10:33	11/17/21 16:20	7439-89-6	
Magnesium	**29500**	ug/L	50.0	31.4	1	11/16/21 10:33	11/17/21 16:20	7439-95-4	
Manganese	**276**	ug/L	5.0	0.74	1	11/16/21 10:33	11/17/21 16:20	7439-96-5	
Potassium	**9330**	ug/L	500	146	1	11/16/21 10:33	11/17/21 16:20	7440-09-7	
Sodium	**28100**	ug/L	500	254	1	11/16/21 10:33	11/17/21 16:20	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**347**	mg/L	2.0	2.0	1		11/17/21 10:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**568**	mg/L	10.0	10.0	1		11/17/21 10:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**50.1**	mg/L	10.0	3.9	10		11/17/21 11:45	16887-00-6	B
Fluoride	**0.44**	mg/L	0.20	0.086	1		11/17/21 09:36	16984-48-8	L2
Sulfate	**42.8**	mg/L	10.0	4.2	10		11/17/21 11:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-DG-1 **Lab ID: 60385866003** Collected: 11/10/21 11:40 Received: 11/12/21 04:32 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**96.8J**	ug/L	100	8.6	1	11/16/21 10:33	11/17/21 16:23	7440-42-8	
Calcium	**124000**	ug/L	200	75.4	1	11/16/21 10:33	11/18/21 16:25	7440-70-2	
Iron	**293**	ug/L	50.0	21.4	1	11/16/21 10:33	11/17/21 16:23	7439-89-6	
Magnesium	**29300**	ug/L	50.0	31.4	1	11/16/21 10:33	11/17/21 16:23	7439-95-4	
Manganese	**71.5**	ug/L	5.0	0.74	1	11/16/21 10:33	11/17/21 16:23	7439-96-5	
Potassium	**4190**	ug/L	500	146	1	11/16/21 10:33	11/17/21 16:23	7440-09-7	
Sodium	**4080**	ug/L	500	254	1	11/16/21 10:33	11/17/21 16:23	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**393**	mg/L	2.0	2.0	1		11/17/21 10:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**451**	mg/L	10.0	10.0	1		11/17/21 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**1.8**	mg/L	1.0	0.39	1		11/17/21 09:47	16887-00-6	B
Fluoride	**0.41**	mg/L	0.20	0.086	1		11/17/21 09:47	16984-48-8	L2
Sulfate	**19.1**	mg/L	1.0	0.42	1		11/17/21 09:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-DG-2 **Lab ID: 60385866004** Collected: 11/10/21 12:35 Received: 11/12/21 04:32 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**86.7J**	ug/L	100	8.6	1	11/16/21 10:33	11/17/21 16:25	7440-42-8	
Calcium	**130000**	ug/L	200	75.4	1	11/16/21 10:33	11/18/21 16:28	7440-70-2	
Iron	**51.9**	ug/L	50.0	21.4	1	11/16/21 10:33	11/17/21 16:25	7439-89-6	
Magnesium	**27200**	ug/L	50.0	31.4	1	11/16/21 10:33	11/17/21 16:25	7439-95-4	
Manganese	**473**	ug/L	5.0	0.74	1	11/16/21 10:33	11/17/21 16:25	7439-96-5	
Potassium	**6110**	ug/L	500	146	1	11/16/21 10:33	11/17/21 16:25	7440-09-7	
Sodium	**4190**	ug/L	500	254	1	11/16/21 10:33	11/17/21 16:25	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**384**	mg/L	2.0	2.0	1		11/17/21 10:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**491**	mg/L	10.0	10.0	1		11/17/21 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.7**	mg/L	1.0	0.39	1		11/16/21 23:03	16887-00-6	B
Fluoride	**0.41**	mg/L	0.20	0.086	1		11/16/21 23:03	16984-48-8	L2
Sulfate	**33.1**	mg/L	5.0	2.1	5		11/16/21 23:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-DG-3 **Lab ID: 60385866005** Collected: 11/10/21 13:45 Received: 11/12/21 04:32 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**87.7J**	ug/L	100	8.6	1	11/16/21 10:33	11/17/21 16:27	7440-42-8	
Calcium	**146000**	ug/L	200	75.4	1	11/16/21 10:33	11/18/21 16:31	7440-70-2	
Iron	**178**	ug/L	50.0	21.4	1	11/16/21 10:33	11/17/21 16:27	7439-89-6	
Magnesium	**32500**	ug/L	50.0	31.4	1	11/16/21 10:33	11/17/21 16:27	7439-95-4	
Manganese	**1010**	ug/L	5.0	0.74	1	11/16/21 10:33	11/17/21 16:27	7439-96-5	
Potassium	**5760**	ug/L	500	146	1	11/16/21 10:33	11/17/21 16:27	7440-09-7	
Sodium	**5180**	ug/L	500	254	1	11/16/21 10:33	11/17/21 16:27	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**419**	mg/L	2.0	2.0	1		11/17/21 10:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**547**	mg/L	10.0	10.0	1		11/17/21 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.7**	mg/L	1.0	0.39	1		11/16/21 23:30	16887-00-6	B
Fluoride	**0.43**	mg/L	0.20	0.086	1		11/16/21 23:30	16984-48-8	L2
Sulfate	**46.8**	mg/L	5.0	2.1	5		11/16/21 23:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-DG-4 **Lab ID: 60385866006** Collected: 11/10/21 14:55 Received: 11/12/21 04:32 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**90.7J**	ug/L	100	8.6	1	11/16/21 10:33	11/17/21 16:29	7440-42-8	
Calcium	**136000**	ug/L	200	75.4	1	11/16/21 10:33	11/18/21 16:33	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	11/16/21 10:33	11/17/21 16:29	7439-89-6	
Magnesium	**40700**	ug/L	50.0	31.4	1	11/16/21 10:33	11/17/21 16:29	7439-95-4	
Manganese	**809**	ug/L	5.0	0.74	1	11/16/21 10:33	11/17/21 16:29	7439-96-5	
Potassium	**7900**	ug/L	500	146	1	11/16/21 10:33	11/17/21 16:29	7440-09-7	
Sodium	**26900**	ug/L	500	254	1	11/16/21 10:33	11/17/21 16:29	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**442**	mg/L	2.0	2.0	1		11/17/21 10:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**643**	mg/L	10.0	10.0	1		11/17/21 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**58.3**	mg/L	5.0	1.9	5		11/17/21 01:04	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	0.086	1		11/17/21 00:50	16984-48-8	L2
Sulfate	**49.9**	mg/L	5.0	2.1	5		11/17/21 01:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-SCPC-DUP-1 **Lab ID: 60385866007** Collected: 11/10/21 00:00 Received: 11/12/21 04:32 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**119**	ug/L	100	8.6	1	11/16/21 10:33	11/17/21 16:31	7440-42-8	
Calcium	**125000**	ug/L	200	75.4	1	11/16/21 10:33	11/18/21 16:36	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	11/16/21 10:33	11/17/21 16:31	7439-89-6	
Magnesium	**29700**	ug/L	50.0	31.4	1	11/16/21 10:33	11/17/21 16:31	7439-95-4	
Manganese	**283**	ug/L	5.0	0.74	1	11/16/21 10:33	11/17/21 16:31	7439-96-5	
Potassium	**9200**	ug/L	500	146	1	11/16/21 10:33	11/17/21 16:31	7440-09-7	
Sodium	**28300**	ug/L	500	254	1	11/16/21 10:33	11/17/21 16:31	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**347**	mg/L	2.0	2.0	1		11/17/21 10:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**563**	mg/L	10.0	10.0	1		11/17/21 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**58.1**	mg/L	5.0	1.9	5		11/17/21 01:30	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	0.086	1		11/17/21 01:17	16984-48-8	L2
Sulfate	**57.2**	mg/L	5.0	2.1	5		11/17/21 01:30	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-SCPC-FB-1 **Lab ID: 60385866008** Collected: 11/10/21 15:15 Received: 11/12/21 04:32 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**<8.6**	ug/L	100	8.6	1	11/16/21 10:33	11/17/21 16:33	7440-42-8	
Calcium	**<75.4**	ug/L	200	75.4	1	11/16/21 10:33	11/17/21 16:33	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	11/16/21 10:33	11/17/21 16:33	7439-89-6	
Magnesium	**<31.4**	ug/L	50.0	31.4	1	11/16/21 10:33	11/17/21 16:33	7439-95-4	
Manganese	**<0.74**	ug/L	5.0	0.74	1	11/16/21 10:33	11/17/21 16:33	7439-96-5	
Potassium	**<146**	ug/L	500	146	1	11/16/21 10:33	11/17/21 16:33	7440-09-7	
Sodium	**<254**	ug/L	500	254	1	11/16/21 10:33	11/17/21 16:33	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**3.4**	mg/L	2.0	2.0	1		11/17/21 10:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		11/17/21 10:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**0.47J**	mg/L	1.0	0.39	1		11/17/21 01:44	16887-00-6	B
Fluoride	**<0.086**	mg/L	0.20	0.086	1		11/17/21 01:44	16984-48-8	L2
Sulfate	**<0.42**	mg/L	1.0	0.42	1		11/17/21 01:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-BMW-1S **Lab ID: 60385860001** Collected: 11/08/21 14:41 Received: 11/10/21 05:17 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**66.9J**	ug/L	100	8.6	1	12/03/21 10:02	12/07/21 18:12	7440-42-8	
Calcium	**160000**	ug/L	2000	754	10	12/03/21 10:02	12/08/21 12:34	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	12/03/21 10:02	12/07/21 18:12	7439-89-6	
Magnesium	**29800**	ug/L	50.0	31.4	1	12/03/21 10:02	12/07/21 18:12	7439-95-4	
Manganese	**895**	ug/L	5.0	0.74	1	12/03/21 10:02	12/07/21 18:12	7439-96-5	
Potassium	**470J**	ug/L	500	146	1	12/03/21 10:02	12/07/21 18:12	7440-09-7	
Sodium	**4840**	ug/L	500	254	1	12/03/21 10:02	12/07/21 18:12	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**426**	mg/L	2.0	2.0	1		11/16/21 11:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**534**	mg/L	10.0	10.0	1		11/15/21 09:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**7.4**	mg/L	1.0	0.39	1		11/22/21 10:15	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		11/22/21 10:15	16984-48-8	
Sulfate	**31.8**	mg/L	5.0	2.1	5		11/22/21 10:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60385866

Sample: S-BMW-3S **Lab ID: 60385860002** Collected: 11/08/21 15:15 Received: 11/10/21 05:17 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**67.8J**	ug/L	100	8.6	1	12/03/21 10:02	12/07/21 18:14	7440-42-8	
Calcium	**137000**	ug/L	2000	754	10	12/03/21 10:02	12/08/21 12:36	7440-70-2	
Iron	**56.3**	ug/L	50.0	21.4	1	12/03/21 10:02	12/07/21 18:14	7439-89-6	
Magnesium	**23500**	ug/L	50.0	31.4	1	12/03/21 10:02	12/07/21 18:14	7439-95-4	
Manganese	**364**	ug/L	5.0	0.74	1	12/03/21 10:02	12/07/21 18:14	7439-96-5	
Potassium	**533**	ug/L	500	146	1	12/03/21 10:02	12/07/21 18:14	7440-09-7	
Sodium	**5710**	ug/L	500	254	1	12/03/21 10:02	12/07/21 18:14	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**356**	mg/L	2.0	2.0	1		11/16/21 11:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**461**	mg/L	10.0	10.0	1		11/15/21 09:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**12.0**	mg/L	1.0	0.39	1		11/22/21 10:38	16887-00-6	
Fluoride	**0.46**	mg/L	0.20	0.086	1		11/22/21 10:38	16984-48-8	
Sulfate	**31.2**	mg/L	5.0	2.1	5		11/22/21 10:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 756549
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

METHOD BLANK: 3027374 Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	11/17/21 16:00	
Calcium	ug/L	<75.4	200	75.4	11/17/21 16:00	
Iron	ug/L	<21.4	50.0	21.4	11/17/21 16:00	
Magnesium	ug/L	<31.4	50.0	31.4	11/17/21 16:00	
Manganese	ug/L	<0.74	5.0	0.74	11/17/21 16:00	
Potassium	ug/L	<146	500	146	11/17/21 16:00	
Sodium	ug/L	<254	500	254	11/17/21 16:00	

LABORATORY CONTROL SAMPLE: 3027375

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	991	99	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Iron	ug/L	10000	10300	103	85-115	
Magnesium	ug/L	10000	10400	104	85-115	
Manganese	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	10200	102	85-115	
Sodium	ug/L	10000	10200	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3027376 3027377

Parameter	Units	60385198001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	203	1000	1000	1200	1190	100	98	70-130	1	20	
Calcium	ug/L	94100	10000	10000	99700	99600	56	55	70-130	0	20	M1
Iron	ug/L	70.6	10000	10000	10100	9800	100	97	70-130	3	20	
Magnesium	ug/L	24500	10000	10000	33600	32600	91	81	70-130	3	20	
Manganese	ug/L	384	1000	1000	1390	1350	101	96	70-130	3	20	
Potassium	ug/L	73800	10000	10000	83300	83100	95	93	70-130	0	20	
Sodium	ug/L	138000	10000	10000	148000	146000	97	84	70-130	1	20	

MATRIX SPIKE SAMPLE: 3027378

Parameter	Units	60385870008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	5240	1000	6440	120	70-130	
Calcium	ug/L	154000	10000	171000	169	70-130	M1

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

MATRIX SPIKE SAMPLE: 3027378

Parameter	Units	60385870008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	<21.4	10000	9770	98	70-130	
Magnesium	ug/L	37800	10000	46300	84	70-130	
Manganese	ug/L	533	1000	1520	99	70-130	
Potassium	ug/L	3960	10000	14500	106	70-130	
Sodium	ug/L	48500	10000	60600	120	70-130	

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 758442
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60385866001

METHOD BLANK: 3035306 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	12/01/21 11:39	
Calcium	ug/L	<75.4	200	75.4	12/01/21 11:39	
Iron	ug/L	40.8J	50.0	21.4	12/01/21 11:39	
Magnesium	ug/L	<31.4	50.0	31.4	12/01/21 11:39	
Manganese	ug/L	<0.74	5.0	0.74	12/01/21 11:39	
Potassium	ug/L	<146	500	146	12/01/21 11:39	
Sodium	ug/L	<254	500	254	12/01/21 11:39	

LABORATORY CONTROL SAMPLE: 3035307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	965	97	85-115	
Calcium	ug/L	10000	9880	99	85-115	
Iron	ug/L	10000	9850	98	85-115	
Magnesium	ug/L	10000	10700	107	85-115	
Manganese	ug/L	1000	997	100	85-115	
Potassium	ug/L	10000	9720	97	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3035308 3035309

Parameter	Units	60385866001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	93.1J	1000	1000	1050	1060	95	96	70-130	1	20	
Calcium	ug/L	96900	10000	10000	114000	115000	172	184	70-130	1	20	M1
Iron	ug/L	<21.4	10000	10000	9590	9590	96	96	70-130	0	20	
Magnesium	ug/L	21200	10000	10000	29000	29200	78	80	70-130	1	20	
Manganese	ug/L	155	1000	1000	1100	1100	94	95	70-130	0	20	
Potassium	ug/L	4490	10000	10000	14400	14600	99	101	70-130	2	20	
Sodium	ug/L	41400	10000	10000	50900	51800	95	104	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 759536
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385860001, 60385860002

METHOD BLANK: 3038952 Matrix: Water
Associated Lab Samples: 60385860001, 60385860002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	12/07/21 18:04	
Calcium	ug/L	<75.4	200	75.4	12/07/21 18:04	
Iron	ug/L	<21.4	50.0	21.4	12/07/21 18:04	
Magnesium	ug/L	<31.4	50.0	31.4	12/07/21 18:04	
Manganese	ug/L	<0.74	5.0	0.74	12/07/21 18:04	
Potassium	ug/L	<146	500	146	12/07/21 18:04	
Sodium	ug/L	<254	500	254	12/07/21 18:04	

LABORATORY CONTROL SAMPLE: 3038953

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1000	100	85-115	
Calcium	ug/L	10000	9980	100	85-115	
Iron	ug/L	10000	10000	100	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3038956 3038957

Parameter	Units	60385860004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	22500	1000	1000	25100	24300	259	181	70-130	3	20	M1
Calcium	ug/L	291000	10000	10000	304000	303000	131	123	70-130	0	20	M1
Iron	ug/L	43.0J	10000	10000	10500	10300	105	103	70-130	2	20	
Magnesium	ug/L	71300	10000	10000	84000	82600	127	113	70-130	2	20	
Manganese	ug/L	509	1000	1000	1590	1550	108	104	70-130	3	20	
Potassium	ug/L	4790	10000	10000	15800	15300	110	105	70-130	3	20	
Sodium	ug/L	97500	10000	10000	115000	111000	170	130	70-130	4	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 650630
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 60385860001, 60385860002

METHOD BLANK: 2998639 Matrix: Water
Associated Lab Samples: 60385860001, 60385860002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<2.0	2.0	2.0	11/16/21 11:33	

LABORATORY CONTROL SAMPLE: 2998640

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.8	98	90-110	

SAMPLE DUPLICATE: 2998641

Parameter	Units	60385860003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	310	316	2	20	

SAMPLE DUPLICATE: 2998642

Parameter	Units	60385860004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	342	357	4	20	

SAMPLE DUPLICATE: 2998643

Parameter	Units	60385861001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	286	298	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 650697
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 60385866001

METHOD BLANK: 2998895 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<2.0	2.0	2.0	11/16/21 15:34	

LABORATORY CONTROL SAMPLE: 2998896

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.6	97	90-110	

SAMPLE DUPLICATE: 2998897

Parameter	Units	60385866001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	333	329	1	20	

SAMPLE DUPLICATE: 2998898

Parameter	Units	50302405011 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	165	178	7	20	

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 650882 — Analysis Method: SM 2320B
QC Batch Method: SM 2320B — Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

METHOD BLANK: 2999813 — Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<2.0	2.0	2.0	11/17/21 10:43	

LABORATORY CONTROL SAMPLE: 2999814

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.2	96	90-110	

SAMPLE DUPLICATE: 2999815

Parameter	Units	60385866002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	347	364	5	20	

SAMPLE DUPLICATE: 2999816

Parameter	Units	60385853004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	141	143	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 756220
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385860001, 60385860002

METHOD BLANK: 3026260 Matrix: Water
Associated Lab Samples: 60385860001, 60385860002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/15/21 09:44	

LABORATORY CONTROL SAMPLE: 3026261

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	981	98	80-120	

SAMPLE DUPLICATE: 3026262

Parameter	Units	60385853001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	489	484	1	10	

SAMPLE DUPLICATE: 3026263

Parameter	Units	60385573006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	371	349	6	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 756569
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385866001

METHOD BLANK: 3027456 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/16/21 09:56	

LABORATORY CONTROL SAMPLE: 3027457

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	989	99	80-120	

SAMPLE DUPLICATE: 3027458

Parameter	Units	60385861001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	390	384	2	10	

SAMPLE DUPLICATE: 3027459

Parameter	Units	60385866001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	461	474	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 756844 — Analysis Method: SM 2540C
QC Batch Method: SM 2540C — Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

METHOD BLANK: 3028772 — Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/17/21 10:01	

LABORATORY CONTROL SAMPLE: 3028773

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	978	98	80-120	

SAMPLE DUPLICATE: 3028774

Parameter	Units	60385860016 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	967	1010	4	10	

SAMPLE DUPLICATE: 3028775

Parameter	Units	60385870004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	841	871	4	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 756243
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

METHOD BLANK: 3026411 Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.44J	1.0	0.39	11/15/21 08:37	
Fluoride	mg/L	<0.086	0.20	0.086	11/15/21 08:37	
Sulfate	mg/L	<0.42	1.0	0.42	11/15/21 08:37	

METHOD BLANK: 3029175 Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.45J	1.0	0.39	11/16/21 08:04	
Fluoride	mg/L	<0.086	0.20	0.086	11/16/21 08:04	
Sulfate	mg/L	<0.42	1.0	0.42	11/16/21 08:04	

METHOD BLANK: 3029202 Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.43J	1.0	0.39	11/16/21 12:15	
Fluoride	mg/L	<0.086	0.20	0.086	11/16/21 12:15	
Sulfate	mg/L	<0.42	1.0	0.42	11/16/21 12:15	

METHOD BLANK: 3029249 Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.53J	1.0	0.39	11/16/21 08:24	
Fluoride	mg/L	<0.086	0.20	0.086	11/16/21 08:24	
Sulfate	mg/L	<0.42	1.0	0.42	11/16/21 08:24	

METHOD BLANK: 3029445 Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.46J	1.0	0.39	11/17/21 08:09	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

METHOD BLANK: 3029445 Matrix: Water
Associated Lab Samples: 60385866002, 60385866003, 60385866004, 60385866005, 60385866006, 60385866007, 60385866008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.086	0.20	0.086	11/17/21 08:09	
Sulfate	mg/L	<0.42	1.0	0.42	11/17/21 08:09	

LABORATORY CONTROL SAMPLE: 3026412

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	90	90-110	
Sulfate	mg/L	5	4.7	93	90-110	

LABORATORY CONTROL SAMPLE: 3029176

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	90-110	
Fluoride	mg/L	2.5	2.7	108	90-110	
Sulfate	mg/L	5	5.3	105	90-110	

LABORATORY CONTROL SAMPLE: 3029203

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	5	5.1	101	90-110	

LABORATORY CONTROL SAMPLE: 3029250

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

LABORATORY CONTROL SAMPLE: 3029446

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.8	110	90-110	
Sulfate	mg/L	5	5.4	108	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

MATRIX SPIKE SAMPLE: 3026415

Parameter	Units	60385866005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	2.7	5	7.1	89	80-120	
Fluoride	mg/L	0.43	2.5	2.7	89	80-120	
Sulfate	mg/L	46.8	25	70.4	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3026423 3026424

Parameter	Units	60385384002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	26.6	25	25	68.5	51.4	168	99	80-120	29	15	M1,R1
Fluoride	mg/L	0.35	2.5	2.5	2.6	2.6	89	89	80-120	1	15	
Sulfate	mg/L	115	50	50	164	168	99	106	80-120	2	15	

SAMPLE DUPLICATE: 3026422

Parameter	Units	60385758001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	2280	2000	13	15	
Fluoride	mg/L	3.7	3.9	5	15	
Sulfate	mg/L	2520	1240	68	15	D6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 756749
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385866001

METHOD BLANK: 3028333 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.62J	1.0	0.39	11/18/21 19:27	
Fluoride	mg/L	<0.086	0.20	0.086	11/18/21 19:27	
Sulfate	mg/L	<0.42	1.0	0.42	11/18/21 19:27	

METHOD BLANK: 3032298 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.55J	1.0	0.39	11/20/21 15:11	
Fluoride	mg/L	<0.086	0.20	0.086	11/20/21 15:11	
Sulfate	mg/L	<0.42	1.0	0.42	11/20/21 15:11	

METHOD BLANK: 3033018 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/19/21 06:44	
Fluoride	mg/L	<0.086	0.20	0.086	11/19/21 06:44	
Sulfate	mg/L	<0.42	1.0	0.42	11/19/21 06:44	

METHOD BLANK: 3035246 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/24/21 07:22	
Fluoride	mg/L	<0.086	0.20	0.086	11/24/21 07:22	
Sulfate	mg/L	<0.42	1.0	0.42	11/24/21 07:22	

METHOD BLANK: 3035260 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/21/21 13:18	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

METHOD BLANK: 3035260 Matrix: Water
Associated Lab Samples: 60385866001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.086	0.20	0.086	11/21/21 13:18	
Sulfate	mg/L	<0.42	1.0	0.42	11/21/21 13:18	

LABORATORY CONTROL SAMPLE: 3028334

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	101	90-110	
Fluoride	mg/L	2.5	2.7	110	90-110	
Sulfate	mg/L	5	5.5	110	90-110	

LABORATORY CONTROL SAMPLE: 3032299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	
Sulfate	mg/L	5	5.4	108	90-110	

LABORATORY CONTROL SAMPLE: 3033019

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	
Sulfate	mg/L	5	5.2	105	90-110	

LABORATORY CONTROL SAMPLE: 3035247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

LABORATORY CONTROL SAMPLE: 3035261

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3028335 3028336

Parameter	Units	60385861001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.9	5	5	6.4	6.4	91	91	80-120	0	15	
Fluoride	mg/L	0.46	2.5	2.5	3.2	3.1	108	107	80-120	1	15	
Sulfate	mg/L	41.5	25	25	68.8	68.9	109	109	80-120	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3028338 3028339

Parameter	Units	60385866001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	33.7	25	25	59.8	60.3	104	106	80-120	1	15	
Fluoride	mg/L	0.23	2.5	2.5	3.0	2.8	110	104	80-120	5	15	
Sulfate	mg/L	41.7	25	25	68.1	68.4	105	107	80-120	1	15	

SAMPLE DUPLICATE: 3028337

Parameter	Units	60385861001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1.9	1.8	2	15	
Fluoride	mg/L	0.46	0.39	18	15	D6
Sulfate	mg/L	41.5	41.7	0	15	

SAMPLE DUPLICATE: 3028340

Parameter	Units	60385866001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	33.7	33.2	2	15	
Fluoride	mg/L	0.23	0.24	4	15	
Sulfate	mg/L	41.7	42.4	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

QC Batch: 757720
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385860001, 60385860002

METHOD BLANK: 3032270 Matrix: Water
Associated Lab Samples: 60385860001, 60385860002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/22/21 07:09	
Fluoride	mg/L	<0.086	0.20	0.086	11/22/21 07:09	
Sulfate	mg/L	<0.42	1.0	0.42	11/22/21 07:09	

METHOD BLANK: 3035149 Matrix: Water
Associated Lab Samples: 60385860001, 60385860002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.69J	1.0	0.39	11/23/21 16:29	
Fluoride	mg/L	<0.086	0.20	0.086	11/23/21 16:29	
Sulfate	mg/L	<0.42	1.0	0.42	11/23/21 16:29	

METHOD BLANK: 3035264 Matrix: Water
Associated Lab Samples: 60385860001, 60385860002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/24/21 08:56	
Fluoride	mg/L	<0.086	0.20	0.086	11/24/21 08:56	
Sulfate	mg/L	<0.42	1.0	0.42	11/24/21 08:56	

LABORATORY CONTROL SAMPLE: 3032271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

LABORATORY CONTROL SAMPLE: 3035150

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	100	90-110	
Fluoride	mg/L	2.5	2.6	106	90-110	
Sulfate	mg/L	5	5.2	103	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60385866

LABORATORY CONTROL SAMPLE: 3035265

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3032272 3032273

Parameter	Units	60385860003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.8	25	25	45.8	46.3	96	98	80-120	1	15	
Fluoride	mg/L	0.55	2.5	2.5	3.0	3.0	97	99	80-120	1	15	
Sulfate	mg/L	835	500	500	1440	1410	121	116	80-120	2	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3032274 3032275

Parameter	Units	60385860004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.3	5	5	8.6	7.5	107	86	80-120	13	15	
Fluoride	mg/L	<0.086	2.5	2.5	2.9	2.9	116	115	80-120	1	15	
Sulfate	mg/L	809	500	500	1330	1350	104	108	80-120	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN SCPC
Pace Project No.: 60385866

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC
Pace Project No.: 60385866

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60385860001	S-BMW-1S	EPA 200.7	759536	EPA 200.7	759739
60385860002	S-BMW-3S	EPA 200.7	759536	EPA 200.7	759739
60385866001	S-UG-2	EPA 200.7	758442	EPA 200.7	758579
60385866002	S-UG-1A	EPA 200.7	756549	EPA 200.7	756657
60385866003	S-DG-1	EPA 200.7	756549	EPA 200.7	756657
60385866004	S-DG-2	EPA 200.7	756549	EPA 200.7	756657
60385866005	S-DG-3	EPA 200.7	756549	EPA 200.7	756657
60385866006	S-DG-4	EPA 200.7	756549	EPA 200.7	756657
60385866007	S-SCPC-DUP-1	EPA 200.7	756549	EPA 200.7	756657
60385866008	S-SCPC-FB-1	EPA 200.7	756549	EPA 200.7	756657
60385860001	S-BMW-1S	EPA 903.1	475137		
60385860002	S-BMW-3S	EPA 903.1	475137		
60385860001	S-BMW-1S	EPA 904.0	475138		
60385860002	S-BMW-3S	EPA 904.0	475138		
60385860001	S-BMW-1S	SM 2320B	650630		
60385860002	S-BMW-3S	SM 2320B	650630		
60385866001	S-UG-2	SM 2320B	650697		
60385866002	S-UG-1A	SM 2320B	650882		
60385866003	S-DG-1	SM 2320B	650882		
60385866004	S-DG-2	SM 2320B	650882		
60385866005	S-DG-3	SM 2320B	650882		
60385866006	S-DG-4	SM 2320B	650882		
60385866007	S-SCPC-DUP-1	SM 2320B	650882		
60385866008	S-SCPC-FB-1	SM 2320B	650882		
60385860001	S-BMW-1S	SM 2540C	756220		
60385860002	S-BMW-3S	SM 2540C	756220		
60385866001	S-UG-2	SM 2540C	756569		
60385866002	S-UG-1A	SM 2540C	756844		
60385866003	S-DG-1	SM 2540C	756844		
60385866004	S-DG-2	SM 2540C	756844		
60385866005	S-DG-3	SM 2540C	756844		
60385866006	S-DG-4	SM 2540C	756844		
60385866007	S-SCPC-DUP-1	SM 2540C	756844		
60385866008	S-SCPC-FB-1	SM 2540C	756844		
60385860001	S-BMW-1S	EPA 300.0	757720		
60385860002	S-BMW-3S	EPA 300.0	757720		
60385866001	S-UG-2	EPA 300.0	756749		
60385866002	S-UG-1A	EPA 300.0	756243		
60385866003	S-DG-1	EPA 300.0	756243		
60385866004	S-DG-2	EPA 300.0	756243		
60385866005	S-DG-3	EPA 300.0	756243		
60385866006	S-DG-4	EPA 300.0	756243		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC
Pace Project No.: 60385866

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60385866007	**S-SCPC-DUP-1**	EPA 300.0	756243		
60385866008	**S-SCPC-FB-1**	EPA 300.0	756243		

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Sample Condition Upon Receipt

WO# : 60385866

60385866

Client Name: Golder Assoc.

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☑ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ ZPLC

Thermometer Used: T244 **Type of Ice:** ~~Wet~~ Blue None

Cooler Temperature (°C): **As-read** 2.1, 3.3, 2.2 (4.3, 1.8) **Corr. Factor** -0.2 **Corrected** 1.9, 3.1, 2.0 (4.3, 1.6)

Date and initials of person examining contents: CL 11/12

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	TDS exp 11/15
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# 603173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution:

REVIEWED
By jchurch at 12:52 pm, 11/12/21

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren SCPC
Project Number:	153-140603.0003C (COC #10)

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
	WP
	AR
	OT
	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Requested Analysis Filtered (Y/N)	N	N	N	N		60385866
1	S-UG-1A	WT	G																					
2	S-UG-2	WT	G			11-9-21	1202		2	1		1							1	1	1	1		
3	S-DG-1	WT	G																					
4	S-DG-2	WT	G																					
5	S-DG-3	WT	G																					
6	S-DG-4	WT	G																					
7	S-SCPC-DUP-1	WT	G																					
8	S-SCPC-FB-1	WT	G																					
9	S-SCPC-MS-1	WT	G			11-9-21	1202		2	1		1							1	1	1	1		
10	S-SCPC-MSD-1	WT	G			11-9-21	1202		2	1		1							1	1	1	1		
11	S-BMW-1S	WT	G			11-8-21	1441		2			1							1	1	1	1		
12	S-BMW-3S	WT	G			1	1515		2			1							1	1	1	1		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
*EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B	Sierra Shields / Golder	11/9/21	1530	Angela McN	11/9	1535
	Angela McN	11/9	1535	[signature]	11.10.21	0517

SAMPLE CONDITIONS			
Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.9	Y	Y	Y
2.0			
1.6			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Sierra Shields

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 11/9/21

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

Pace Analytical® www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60385866

60385866

Client Name: Golder Assoc.

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☑ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ ZPLC

Thermometer Used: T209 1.6, 13.5, 0.9, 12.3 **Type of Ice:** (Wet) Blue None 1.4, 13.3, 0.7,

Cooler Temperature (°C): As-read 1.6, 20.1 **Corr. Factor** -0.2 **Corrected** 1.4, 1.8, 12.1

Date and initials of person examining contents: EL 11-13-21

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	TDS 11/17
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: W t	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# 60717	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

REVIEWED
By jchurch at 1:51 pm, 11/13/21

Project Manager Review: _____ Date: _____

F-KS-C-003-Rev.11, February 28, 2018

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A — Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B — Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren SCPC
Project Number:	153-140603.0003C (COC #10)

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285

REGULATORY AGENCY

NPDES / GROUND WATER DRINKING WATER
UST RCRA OTHER

Site Location STATE: MO

Section D — Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
	WP
	AR
	OT
	TS

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	S-UG-1A	WT	G			11-10-21	1015		2	1		1							/	/	/	/		60385866
2	S-UG-2	WT	G																					
3	S-DG-1	WT	G			11-10-21	1140																	
4	S-DG-2	WT	G			11-10-21	1235																	
5	S-DG-3	WT	G			11-10-21	1345																	
6	S-DG-4	WT	G			11-10-21	1455																	
7	S-SCPC-DUP-1	WT	G			11-10-21	—		2	1		1							/	1	/	/		
8	S-SCPC-FB-1	WT	G			11-10-21	1515		2	1		1							/	/	/	/		
9	S-SCPC-MS-1	WT	G																					
10	S-SCPC-MSD-1	WT	G																					
11	S-BMW-1S	WT	G																					
12	S-BMW-3S	WT	G																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B	Sierra Shields / Golder	11/11/21	1640	Elyman / Pace	11/12	0832	Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Sierra Shields

SIGNATURE of SAMPLER: Sierra Shields

DATE Signed (MM/DD/YY): 11/11/21

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

MEMORANDUM

DATE January 6, 2022 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPC – DETECTION MONITORING - DATA PACKAGE 60385866

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a compound was detected in a blank (i.e. method, field), and the blank comparison criterion was not met, associated sample results were qualified as estimates (J) or non-detects (U).
- When duplicate criterion was not met, the associated sample result was qualified as an estimate (J for detects, UJ for non-detects).
- When matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J, J+ for estimates biased high, and J- for estimates biased low).

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J. Ingram
Project Name: Ameren- Sioux - SCPC
Project Number: 153140603
Reviewer: A. Muehlfarth
Validation Date: 1/6/2022

Laboratory: Pace Analytical Services - Kansas City
SDG #: 60385866
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2320B (Alkalinity); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-UG-2, S-UG-1A, S-DG-1, S-DG-2, S-DG-3, S-DG-4, S-SCPC-DUP-1, S-SCPC-FB-1, S-BMW-1S, S-BMW-3S

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			11/8/2021 - 11/10/2021
b) Sampling team indicated?	x			ETF/SSS
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies:

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?	x			See Notes
g) Were any matrix problems noted?	x			See Notes

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	x			See Notes
b) Were analytes detected in the field blank(s)?	x			See Notes
c) Were analytes detected in the equipment blank(s)?			x	
d) Were analytes detected in the trip blank(s)?			x	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	x			
b) Were the proper analytes included in the LCS?	x			
c) Was the LCS accuracy criteria met?	x			See Notes

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	x			
b) Were field dup. precision criteria met (note RPD)?		x		See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			
d) Were lab dup. precision criteria met (note RPD)?		x		See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?			x	
b) Was the %D within control limits?			x	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?		x		See Notes
Recovery could not be calculated since sample contained high concentration of analyte?			x	
b) Was MSD accuracy criteria met?		x		See Notes
Recovery could not be calculated since sample contained high concentration of analyte?			x	
c) Were MS/MSD precision criteria met?		x		See Notes

Comments/Notes:

Chloride, sulfate, and calcium analyzed at a dilution in multiple samples. No qualification necessary.

Blanks:

3035306: Iron (40.8J). Associated with sample 60385866001. Sample ND, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

3026411/3029175/3029202/3029249/3029445: Chloride (0.44J/0.45J/0.43J/0.53J/0.46J). Associated with samples 60385866002 through 60385866008. Results >RL and 10x blank not qualified. Results >RL but <10x blank qualified as estimates. Results < RL reported at RL and qualified as estimates.

3028333/3032298: Chloride (0.62J/0.55J). Associated with sample 60385866001. Result >RL and 10x blanks, no qualification necessary.

3035149: Chloride (0.69J). Associated with samples 60385860001 and 60385860002. Results >RL and 10x blanks, no qualification necessary.

S-SCPC-FB-1 @ S-DG-4: Alkalinity (3.4), chloride (0.47J). Sample results >RL and 10x blank, no qualification necessary.

LCS:

Fluoride in samples -002 through -008 are flagged by the lab as having low LCS reocvery below QC limits. There is no evidence in the quality control data that any LCS recoveries were below QC limits, therefore no qualification required.

Duplicates:

S-SCPC-DUP-1 @ S-UG-1A: RPD exceeds limit (20%) for sulfate (28.8%)

Laboratory analyzed sample duplicates for alkalinity, TDS, and anions.

3026422: RPD exceeds limit (15%) for sulfate (68%). Associated with unrelated sample, no qualification necessary.

3028337: RPD exceeds limit (15%) for fluoride (18%). Associated with unrelated sample, no qualification necessary.

MS/MSD:

3027376/3027377: MS/MSD % recovery low for calcium. MS/MSD performed on unrelated sample, no qualification necessary.

3027378: MS % recovery high for calcium. MS performed on unrelated sample, no qualification necessary.

3035308/3035309: MS/MSD % recovery high for calcium. Associated with sample 60385866001

3038956/3038957: MS % recovery high for calcium, sodium. MS/MSD % recovery high for boron. MS/MSD performed on unrelated sample, no qualification necessary.

3026423/3026424: MS % recovery high, RPD exceeds limit for chloride. MS performed on unrelated sample, no qualification necessary.

3032272/3032273: MS % recovery high for sulfate. MS performed on unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-DG-1	Chloride	1.8	J	Detected in MB, 10x blank > result > RL
S-DG-2	"	2.7	J	"
S-DG-3	"	2.7	J	"
S-SCPC-FB-1	"	1.0	U	Detected in MB, RL > result > MDL
S-UG-1A	Sulfate	42.8	J	Duplicate RPD exceeds limit
S-SCPC-DUP-1	"	57.2	J	"
S-UG-2	Calcium	96900	J+	MS/MSD % recovery high

Signature: Ann Muhlfeith Date: 1/6/2022

APPENDIX B

Alternative Source Demonstration - November 2020 Sampling Event

SCPC - Alternative Source Demonstration

Sioux Energy Center, St. Charles County, Missouri, USA

Submitted to:

Ameren Missouri

1901 Chouteau Ave, St. Louis, MO 63103

Submitted by:

Golder Associates Inc.

13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021

+1 314 984-8800

153140603

June 24, 2021

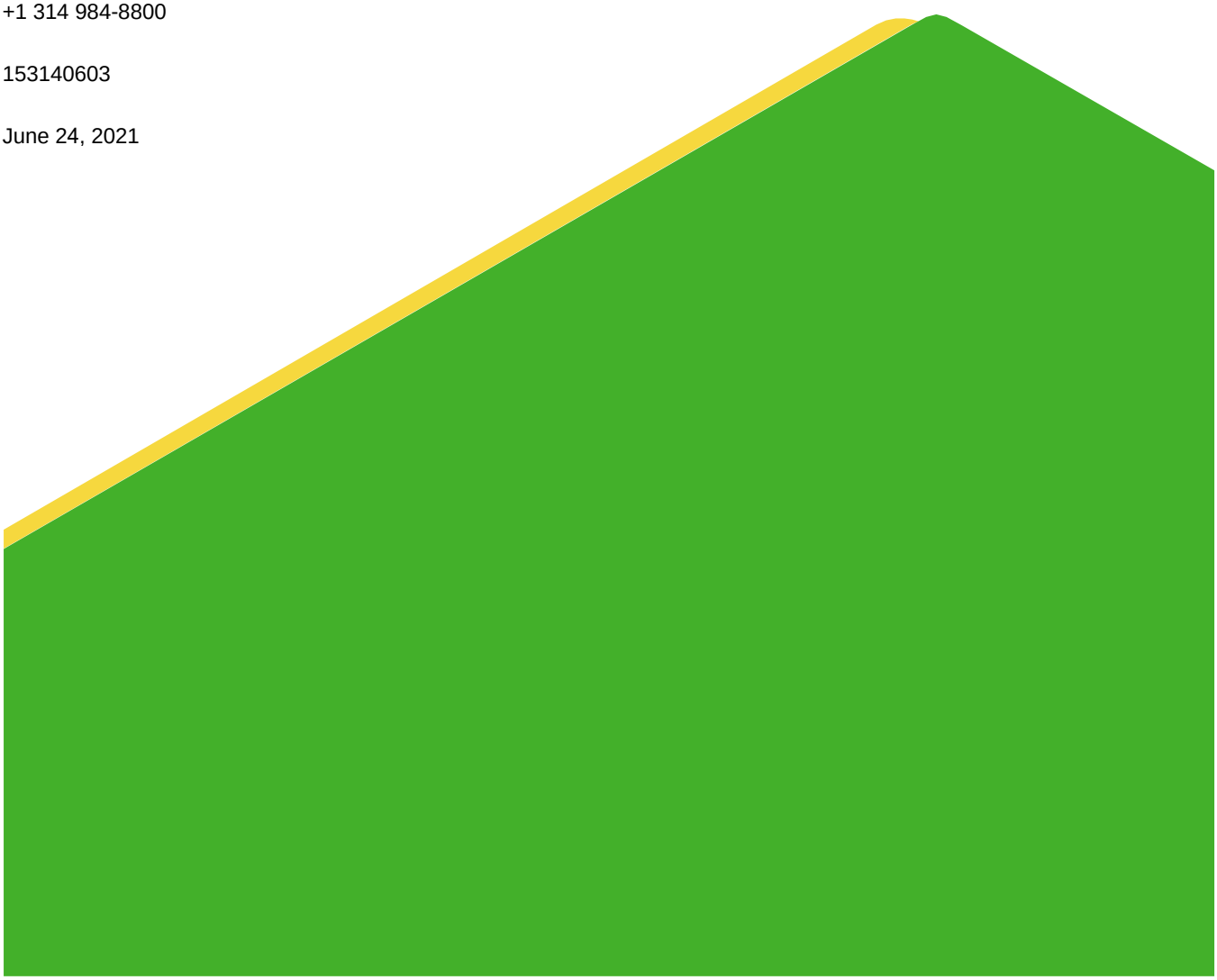


Table of Contents

TABLES

FIGURES

1.0 CERTIFICATION STATEMENT

This *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule) under the direction of a licensed professional engineer with Golder Associates Inc.

I hereby certify that this *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* located at 8501 Missouri 94, West Alton, Missouri 63386 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

GOLDER ASSOCIATES INC.

_____

Mark Haddock, P.E., R.G.

Principal, Practice Leader

2.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this *SCPC – Alternative Source Demonstration* has been prepared to document an Alternative Source Demonstration (ASD) for two Statistically Significant Increases (SSIs) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPC Cell 1. This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.0 SITE DESCRIPTION AND BACKGROUND

Ameren owns and operates the SEC in St. Charles County, Missouri located approximately 12 miles west-northwest of the confluence of the Mississippi and Missouri Rivers. **Figure 1** depicts the site location and layout, including the location of SCPC. The SEC is approximately 1,025 acres and is located in the floodplain between the Mississippi and Missouri Rivers. The SEC is bounded to the north by wooded areas associated with the Mississippi River; to the south by a railroad; and to the east and west by agricultural fields.

3.1 Geological and Hydrogeological Setting

Hydrogeologically, the SCPC lies between the Mississippi River to the north and the Missouri River to the south. Flow and deposition from these rivers have resulted in thick alluvial deposits which lie unconformably on top of bedrock. These alluvial deposits range from approximately 100 to 130 feet thick and comprise the uppermost aquifer, called the alluvial aquifer. Overall, this aquifer is described as a fining upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Drilling in the alluvial aquifer identified different sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are highly variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region includes Mississippian-aged rocks of the Meramecian Series. Formations include primarily limestone, dolomite, and shale and are comprised of the Salem Formation overlying the Warsaw Formation and the Burlington-Keokuk Formation.

3.2 Utility Waste Landfill Cell 1 - SCPC

UWL Cell 1 is referred to by Ameren as the SCPC, or "Gypsum Pond" Cell 1. The SCPC is approximately 37.5 acres in size and is located south of the generating plant on the south side of Highway 94 (**Figure 1**). The CCR Unit manages CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD) which began operation in 2010.

The WFGD process occurs after the removal of slag and fly ash where a crushed limestone ($CaCO_3$) mix is introduced into the boiler flue gas flow. The limestone reacts with the sulfur dioxide (SO_2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate ($CaSO_4 * 2H_2O$)). The resultant gypsum material is wet sluiced from the plant across the highway to the SCPC. Once there, the gypsum dewaters by gravity with the sluice conveying water recycled back to the WFGD for reuse. The primary soluble constituents of the gypsum CCR are sulfate, calcium, chloride, and sodium (Gredell and Reitz & Jens, 2014).

The SCPC was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by an 80-mil HDPE geomembrane liner. Information on the design of the UWL is available in the 2014 Proposed Construction Permit Modification, Construction Permit Number 0918301 (Gredell and Reitz & Jens, 2014).

A groundwater monitoring well network was installed in 2007 and 2008 in order to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of sixteen (16) monitoring wells ringing the current and proposed future extents of the UWL (**Figure 1**). These monitoring wells are installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for groundwater. Quarterly groundwater samples have been collected in these monitoring wells since June 2008 for the state required UWL parameters.

The permit for the SCPC was issued July 30, 2010 (permit #0918301). Nine (9) sampling events were performed prior to July 30, 2010 and represent groundwater quality prior to WFGD placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, the following were completed prior to the October 17, 2017 deadline: (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and (4) eight (8) baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPC consists of eight (8) monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Six (6) existing monitoring wells (UG-1A, UG-2, DG-1, DG-2, DG-3, and DG-4) were installed by Gredell Engineering Resources, Inc. in December 2007 and June 2008 as a part of the state UWL state monitoring program. The remaining monitoring wells (BMW-1S and BMW-3S) were installed by Golder in 2016 for CCR Rule groundwater monitoring purposes. More information on the design and installation of the monitoring wells is provided in the SCPC GMP (Golder, 2017) and the SCPC 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight (8) baseline sampling events were completed for the SCPC. After baseline sampling, the first detection monitoring event was completed in November of 2017. The following Appendix III constituents were sampled during detection monitoring:

- Boron
- Calcium
- Chloride
- pH
- Sulfate
- Total Dissolved Solids (TDS)
- Fluoride

In January 2018, background results from the eight (8) baseline sampling events were used to calculate statistical upper prediction limits (UPLs). These UPLs were then compared to the detection monitoring results from the November 2017 samples and subsequent semi-annual detection monitoring sampling events. If results from the

detection monitoring event were higher than the calculated UPL, it was considered to be an initial exceedance, in which case a verification sample was then collected and tested in accordance with the SCPC Statistical Analysis Plan (SAP). In August 2019, the background dataset used to calculate statistical limits was expanded to include the first four detection monitoring events, per the SAP. The updated UPLs were then used for the November 2019 and subsequent detection monitoring events. The following provides a summary of the detection monitoring results to date.

- In November 2017, initial exceedances were identified for fluoride at UG-2 and boron at DG-4. Verification sampling results confirmed a Statistically Significant Increase (SSI) for fluoride at UG-2. An ASD was prepared which demonstrated that the SSI for fluoride at UG-2 was primarily caused by natural temporal and spatial variability in the aquifer, a relatively low calculated UPL (when compared to historical data from this well), and low fluoride results that are near the laboratory practical quantitation limit (PQL).
- In May 2018, three (3) initial exceedances were reported for boron at DG-1, DG-3, and DG-4. None were confirmed by verification sampling.
- In November 2018, five (5) initial exceedances were reported for: pH at DG-1, DG-2, and DG-3; boron at DG-1; and sulfate at DG-3. None were confirmed by verification sampling.
- For the August 2019 sampling event, four (4) initial exceedances were reported for: calcium and chloride at UG-1A; fluoride at UG-2; and sulfate at DG-3. All except sulfate at DG-3 were confirmed by verification sampling. An ASD was prepared that demonstrated that the August 2019 SSIs were primarily due to: alluvial aquifer variability of pre-existing impacts, laboratory method accuracy, and limited baseline data available for the calculation of the UPL.
- In November 2019, one (1) initial exceedance was reported for pH at DG-2 that was not confirmed by verification sampling.
- For the April 2020 sampling event, three (3) initial exceedances were reported for fluoride at UG-1A, DG-1, and DG-4. Only fluoride at DG-4 was confirmed by verification sampling. An ASD was prepared that demonstrated that the SSI fluoride at DG-4 was primarily caused by natural temporal and spatial variability in the alluvial aquifer, sampling results that are influenced by pre-existing low-level CCR impacts, and a relatively low calculated UPL.
- In November 2020, four (4) initial exceedances were reported for: calcium at DG-2 and DG-3; fluoride at DG-4; and TDS at DG-2. Only, calcium at DG-2 and fluoride at DG-4 were confirmed by verification sampling. The results from the November 2020 detection monitoring event are summarized in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Monitoring wells DG-2 and DG-4 are screened in the upper portion of the alluvial aquifer just below the average seasonal low for groundwater. As shown in **Figure 1**, DG-2 and DG-4 are located south to southwest of the SCPC, south of the generating plant, and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

Based on Golder's review of the pre-disposal data (discussed in Section 3.2 above), as well as our comparison of the pre-disposal data with the results from the eight CCR-rule baseline events, it was concluded that the groundwater at the SCPC contained low-level pre-existing impacts from CCR that pre-dated SCPC construction and operation. As a result of these pre-existing impacts, the SCPC statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular

well, and not by pooling data from the background wells, such that individual limits are calculated for each constituent in each well in the monitoring program.

As summarized in **Table** 2, the intrawell UPL for calcium at DG-2 was 142,779 micrograms per liter (µg/L) based on the initial eight (8) baseline sampling events that ranged from 118,000 to 135,000 µg/L. In August 2019, the background data set used to calculate statistical limits was expanded to include the first four detection monitoring events. After the addition of four new data points the UPL decreased from 142,779 µg/L to 139,133 µg/L. During the November 2020 detection monitoring event, a concentration of 145,000 µg/L was reported for calcium at DG-2, which was confirmed in January 2021 by a verification result of 141,000 J µg/L. These values represent an SSI, but it is important to note the results from these sampling events are very close to the UPL with the November event being within 6,000 µg/L (or 4%) and the January verification sampling result being within 2,000 µg/L (or less than 2%) of the UPL.

As summarized in **Table** 2, the intrawell UPL for fluoride at DG-4 was 0.37 milligrams per liter (mg/L) based on the initial eight (8) baseline sampling events that ranged from 0.30 to 0.37 mg/L. The results from this small dataset could not be normalized; therefore, a non-parametric limit was used as the prediction limit (i.e., the highest of the baseline sampling results). In August 2019, the baseline data set was expanded to include the first four detection monitoring events; however, the dataset still could not be normalized, even after the addition of four new data points, so the UPL remained unchanged at 0.37 mg/L. During the November 2020 detection monitoring event, a concentration of 0.41 mg/L was reported for fluoride at DG-4, which was confirmed in January 2021 by a verification result of 0.45 mg/L. These values represent an SSI, but it is important to note the results are very low, and near the calculated PQL at the site with both results being within 0.08 mg/L of the UPL. In addition, the PQL is 0.2 mg/L and the method detection limit is 0.075 mg/L, so both the November 2020 and the January 2021 results are within the range of the PQL/MDL for fluoride.

Table 2: Review of Statistically Significant Increases

Constituent	Well ID	UPL Based on Baseline Events	August 2019 Updated UPL	Baseline Sampling Event Range	State UWL Program Sampling Events Range	November 2020 Results	January 2021 Results
Calcium (µg/L)	DG-2	142,779	139,133	118,000-135,000	119,000-166,000	145,000	141,000 J
Fluoride (mg/L)	DG-4	0.37	0.37	0.30-0.37	0.23-0.48	0.41	0.45

Notes:

1) mg/L – milligrams per liter.
2) µg/L – micrograms per liter.
3) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.
4) J – Result is an estimated value.

5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs at the SCPC are not the result of a release from the SCPC, but are rather from an alternative source. The following section provides additional discussion realted to each of the different lines of evidence, listed below:

- Documentation of pre-existing, low-level concentrations of CCR indicators in groundwater that pre-date the SCPC operation.

- Comparison of key WFGD indicator parameter concentrations (boron, calcium, chloride, fluoride, sodium, and sulfate) prior to and following receipt of CCR in the SCPC.
- Review of historical and current calcium concentrations at DG-2.
- Review of historical and current fluoride concentrations at DG-4.
- Documentation of the construction of the SCPC with a composite liner consiting of 80-mil geomembrane liner and a 2-foot thick clay barrier.
- Preparation of geochemical models displaying current and historical background chemistries.

5.1 CCR Indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 3** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 3: Types of CCR and Typical Indicator Parameters

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Fly Ash	Fine grained, powdery material composed mostly of silica made from the burning of finely ground coal in the boiler.	■ Boron ■ Molybdenum ■ Lithium ■ Sulfate ■ Bromide ■ Potassium ■ Sodium ■ Fluoride
Boiler Slag / Bottom Ash	Molten bottom ash from the slag tap and cyclone type furnaces that turns into pellets that have a smooth glassy appearance after quenching with water.	
Flue Gas Desulfurization Material (FGD)	A material leftover from the process of reducing sulfur dioxide emissions from a coal-fired boiler that can be a wet sludge consisting of calcium sulfite or calcium sulfate or a dry powdered material that is a mixture of sulfites and sulfates.	■ Sulfate ■ Fluoride ■ Calcium ■ Boron ■ Bromide ■ Chloride

Notes:

1) Fly Ash and Boiler Slag/Bottom Ash typically have the same indicator parameters.
2) Definitions from USEPA website, available at https://www.epa.gov/coalash/coal-ash-basics.
3) Key indicators from EPRI 2011, 2012, and 2017 as well as Gredell and Reitz & Jens, 2014.

In 2011, the Electric Power Research Institute (EPRI) completed a study of FGD composition from many sites across the country and determined that calcium sulfate dihydrate ($CaSO_4*2H_20$) constitutes greater than 90% of the material that is present in FGD deposits. Therefore, impacts from WFGD deposits will likely contain high concentrations in sulfate and calcium compared to background and adjacent samples. No statistical exceedances

are noted for sulfate in SCPC monitoring wells, and the low-level SSI of calcium at DG-2 suggests influence from another source and not the WFGD, as discussed below. Additionally, fluoride and boron concentrations are also potential indicators of WFGD gypsum (EPRI 2012, EPRI 2017) and details on the concentration of these parameters are provided in the following sub-sections.

5.1.1 Sulfate Concentrations

Sulfate is a key indicator of potential WFGD impacts because high concentrations of sulfate are found ubiquitously in relatively oxidized WFGD materials. Under strongly reducing conditions, sulfate is converted to sulfide. The groundwater around the SCPC does not demonstrate strongly reducing conditions; dissolved oxygen values are above 0.5 mg/L, oxidation reduction potential (ORP) is positive, dissolved iron concentrations are below 1 mg/L, and no hydrogen sulfide odors are reported at the SCPC. Therefore, if the SSIs were a result of impacts from the SCPC, it would be expected that sulfate values would increase following placement of CCR materials or evidence of sulfide in the groundwater would be noted during groundwater sample collection. Neither increasing sulfate values nor evidence of sulfide in the groundwater are indicated for DG-2 or DG-4.

Figures 2 and **3** display the full historical set of sulfate concentrations at DG-2 and DG-4 including the period prior to the receipt of CCR collected for UWL sampling requirements. If the SSIs were caused by influence from the SCPC, sulfate concentrations would be expected to increase following the placement of CCR materials. **Figures 2 & 3** demonstrate that current sulfate concentrations are at levels lower than those from pre-CCR placement and are thus not indicative of SCPC influence on the groundwater.

5.1.2 Boron Concentrations

Based on the EPRI (2011, 2012, and 2017) reports, elevated concentrations in boron may indicate FGD impacts. Boron is soluble, mobile, and conservative (i.e., does not interact with geologic materials), and thus a good tracer for CCR related impacts. However, any increased boron concentrations associated with a release from a WFGD type impoundment would be expected to also contain increasing sulfate concentrations, as discussed in the previous section. If groundwater was impacted by the SCPC, current boron concentrations should be statistically elevated with respect to pre-CCR placement.

Figures 4 and **5** display boron concentrations at DG-2 and DG-4 from prior to the receipt of CCR through the current CCR Rule sampling event. These figures demonstrate that current boron concentrations are at similar or slightly lower levels to those from pre-CCR placement, and thus not indicative of SCPC influence on the groundwater.

5.1.3 Chloride and Sodium Concentrations

Chloride and sodium are potential indicators for WFGD wastes and can be present at elevated concentrations within the SCPC because the water used for transporting the WFGD slurry to the SCPC is in a closed loop, meaning water is being recycled and re-used, resulting in increased chloride and sodium concentration. Chloride and sodium are also highly soluble, mobile, and conservative under most hydrogeological environments, and as such, are routinely used as indicator parameters of landfill leachate migration at municipal waste facilities throughout the United States. Therefore, if the SSI was caused by an impact from the SCPC, chloride and sodium concentrations would be expected to increase after the placement of CCR.

Figures 6 and **7** are multi constituent time series plots displaying sodium and chloride concentrations at DG-2 and DG-4 from the period prior to the receipt of CCR through the current CCR Rule sampling. These figures display a relatively high degree of variability for chloride and sodium over time. However, these plots do not display a consistent increasing or decreasing trend, but instead show large swings in concentrations. While CCR materials

can contain high concentrations of sodium and chloride, another common alternative source for both sodium and chloride is road salt (sodium chloride). Road salt is commonly used for road de-icing purposes on Dwiggins Road, which is located within 50 feet to the north of DG-4.

Results from this plot display a good correlation between sodium and chloride results. Seasonal variation in sodium and chloride results is likely caused by road salt application, which subsequently dissolves and infiltrates into the shallow aquifer, especially at the roadside well DG-4.

5.2 SSI at DG-2

5.2.1 Calcium Concentrations

Calcium is a key indicator in FGD impoundments because there are high concentrations of calcium in WFGD (calcium sulfate dihydrate) type impoundments. Like sulfate and boron, if the SSI was caused by impacts from the SCPC, calcium concentrations would be expected to be noticeably higher and at levels statistically higher than pre-CCR placement. **Figure 8** displays calcium concentrations at DG-2 from prior to the receipt of CCR through the current CCR Rule sampling event. This figure demonstrates the current calcium concentration of 145,000 µg/L in monitoring well DG-2 is lower than those reported prior to the operation of the SCPC. In addition, calcium concentrations have varied between 119,000 µg/L and 166,000 µg/L over the entire historical monitoring period at DG-2.

It is important to note that the January 2021 verification sampling result of 141,000 J µg/L is within 2% of the calculated UPL for calcium at DG-2 and lower than the initial baseline UPL for DG-2 at 142,779 µg/L. Had the original UPL still been in use, the SSI at DG-2 would not have been confirmed. The natural temporal and spatial variability in the aquifer and the small data set led to the UPL decreasing when updated. However, when looking at **Figure 8,** it is clear that the values used for the updated UPL are not representative of the entire historical dataset at DG-2.

In fact, the four values used to update the UPL in August 2019 are lower than samples taken at the same wells for the State UWL sampling program taken weeks or even days apart. **Table 4**, below, shows a comparison between the calcium concentrations used to update the UPL and calcium concentrations from the State UWL sampling program. As show in the table, during each event, the samples were taken within days of each other. For these four (4) events, the CCR Rule results ranged from 122,000 to 133,000 µg/L while the State UWL sampling results ranged from 133,000 to 144,000. Another prime example of variation within the aquifer is DG-2, which was sampled in June of 2017 on back-to-back days and ranged from 118,000 to 143,000 µg/L. This range of variability is not likely a result of variation within the aquifer but is more likely a result of sampling and/or laboratory analysis variability. Clearly, the baseline dataset has not fully captured the natural spatial and temporal variation within the alluvial aquifer.

Table 4: Comparison of CCR Rule Results Used to Update Calcium UPL and State UWL Results at DG-2

Sampling Event	Sampling Program	Concentration (µg/L)	Date Sampled	Days Apart
November 2017	CCR Rule	128,000	11/14/2017	6
	State UWL	144,000	11/20/2017	
May 2018	CCR Rule	124,000	5/15/2018	13
	State UWL	141,000	5/2/2018	
November 2018	CCR Rule	122,000	11/13/2018	6
	State UWL	138,000	11/7/2018	
August 2019	CCR Rule	133,000	8/19/2019	2
	State UWL	133,000	8/21/2019	

Notes:

1) µg/L – micrograms per liter.
2) CCR - Coal combustion residuals.
3) UWL - Utility waste landfill.
4) UPL - Upper prediction limit.

If the SSI was caused by groundwater influence from the SCPC, calcium concentrations would be expected to be noticeably higher and at levels statistically higher than pre-CCR placement. If only the data collected for the State UWL program prior to the receipt of CCR were used to calculate the prediction limit, the resulting UPL would be 166,000 µg/L, which is well above the November 2020 value of 145,000 µg/L.

Figure 9 shows a box and whisker plot, sometimes referred to as a box plot, which is a graphical technique that summarizes a set of data and shows the distribution and outliers within a dataset. **Figure 9** shows the box and whisker plot for calcium at wells DG-1 through DG-4 prior to the placement of CCR in the SCPC. As shown on **Figure 9**, the distribution of the calcium values prior to the placement of CCR is above 145,000 µg/L at DG-2. These data suggest that, up to four years before the placement of CCR in the SCPC, calcium values in DG-2 were greater than the result reported for November 2020, further supporting the argument that the SSI at DG-2 was not caused by the SCPC, but rather, the natural geochemical variability within the aquifer and/or field sampling/laboratory induced variability are responsible for the noted SSI for calcium in DG-2.

Based on historical and recent data, in addition to the observations reported above for sulfate and boron, it is Golder's opinion that the variability in calcium concentrations over time is not a result of WFGD influence on the groundwater, but is likely a result of natural geochemical variability, field sampling/laboratory induced variability in groundwater concentrations, and the limited sample set used for UPL calculation that does not reflect the whole variability of the aquifer.

5.3 SSI at DG-4

5.3.1 Fluoride at DG-4

While sulfate and calcium are the two primary components of WFGD byproducts, fluoride (which triggered the SSI at DG-4) also may be an indicator of potential impacts from WFGD deposits. However, any increased fluoride

concentrations associated with a release from a FGD impoundment would be expected to also contain increasing sulfate and calcium concentrations. As previously discussed, **Figure 3** displays that sulfate levels at DG-4 are at lower levels than sulfate levels prior to the operation of the SCPC. **Figure 10** demonstrates that current calcium concentrations are at similar or lower levels to those from pre-CCR placement. So, while it is possible that the SSI reported for fluoride in monitoring well DG-4 is from a release of WFGD, the absence of increased concentrations for sulfate and calcium at DG-4 effectively eliminate WFGD as the source.

Figure 11 shows a time series plot of fluoride and compares data from historic State UWL sampling and CCR Rule sampling with the current UPL used for detection monitoring. The current fluoride concentrations of 0.41 mg/L in November 2020 and 0.45 mg/L in January 2021 at monitoring well DG-4 are similar to some historical values reported at DG-4. Overall, fluoride concentrations have varied between 0.23 mg/L and 0.48 mg/L over the entire historical monitoring period at DG-4. Based on these data, in addition to the observations reported above for sulfate and calcium, the variability in fluoride concentrations over time is not a result of WFGD influence on the groundwater, but instead the recent SSI is likely a result of geochemical variability or other sources not related to the SCPC.

Figure 11 also demonstrates the current fluoride concentration of 0.41 mg/L compared to the UPL. The current UPL used for fluoride at DG-4 is 0.37 mg/L. It is important to note that the November 2020 sampling result of 0.41 mg/L and the January 2021 verification sampling result of 0.45 mg/L are within 0.04 and 0.08 mg/L of the predicted UPL for fluoride at DG-4, respectively. As described in Section 4.0, above, these differences are within the range of the PQL and MDL for fluoride and are thus representative of laboratory variability.

The calculated UPL for fluoride in DG-4 is lower than reported values for November 2020 and January 2021 because the twelve (12) background results used to calculate the UPL are not normally distributed and therefore a non-parametric UPL was used, which is equal to the highest value in the background data set. Thus, the calculated statistical limit is a result of a limited background data set, which does not result in a UPL that encompasses the full natural geochemical variability of the aquifer.

If the historical data collected for the state UWL groundwater monitoring program are used to supplement the results collected for the CCR Rule, the low bias becomes evident. If the UPL is calculated using all state monitoring values, the updated limit would be 0.4582 mg/L. This UPL is higher than both the November 2020 and January 2021 reported values. Again, this clearly demonstrates the prediction limit currently used is biased low because the results used to calculate the UPL are from a time when fluoride concentrations in this well were relatively low. If the State UWL data are used to expand the background data set, no SSI would be triggered for fluoride in DG-4. **Figure 11** shows the time series of all samples collected at DG-4 for fluoride compared to these two UPLs. As shown in **Figure 11**, the current UPL of 0.37 mg/L is not representative of natural temporal variability of the aquifer.

As also shown in **Figure 11**, the SSI for fluoride is within the range of historical values for fluoride at DG-4. The twelve (12) sampling events used to calculate the UPL were all collected between 2016 and 2019. When compared to the full suite of data available at DG-4, the results used during this timeframe were lower than historically found at DG-4 which have ranged up to 0.48 mg/L. Nearby monitoring wells, DG-2 and DG-3 have also had historical concentrations as high as 0.48 mg/L and 0.49 mg/L, respectively. Therefore, the UPL calculated from the baseline data only represents the lower range of values in the overall population.

Based on these data, in addition to the observations reported above for sulfate and calcium, it is Golder's opinion that the variability in fluoride concentrations over time is not a result of WFGD influence on the groundwater, but is likely a result of natural geochemical variability or other sources not related to the SCPC.

5.3.2 Geochemical Modeling

In June 2006, temporary groundwater piezometers installed as part of the Detailed Site Investigation (DSI) were sampled for major cation and anion concentrations. These data are available in Appendix 13 of the DSI and the piezometer locations are provided in **Figure 12**. Additionally, during the detection monitoring event in November 2020, major cation and anion concentrations were collected from the CCR Rule monitoring network for the SCPC. These data were used to compare current major ion chemistry with the chemistry from 2006, four (4) years prior to placement of CCR in the UWL.

Table 5 contains the values of the major cations and anions from both the recent and historical sampling events. These data were used to generate of the Stiff and Piper diagrams discussed below. While most of the numbers are similar between the two datasets, chloride and sodium values are significantly higher for some of the wells located near roads. As discussed above in Section 5.1.3, these changes in groundwater chemistry are likely caused by the use of road salt on Highway 94 and are not a result of the SCPC or any other source of CCR.

5.3.3 Stiff Diagrams

Stiff diagrams visually display the major cation and anion data. **Figure 12** displays Stiff diagrams for historical data from 2006, as well as the current SCPC CCR Rule monitoring data. As shown by the similarity of the shapes for June 2006 and November 2020, the data distributions are similar, indicating little variability in geochemistry between the two periods. The only major difference between the two sampling events is the increase in the sodium + potassium and chloride plots, causing a slightly different shape in monitoring well DG-4 relative to piezometer PZ-25. A slight increase in calcium during November 2020 results in a slightly different shape for DG-3 relative to PZ-10 as well. As discussed above, sodium and chloride concentrations are very seasonally dependent and are influenced by the use of road salt on the nearby Highway 94. Therefore, except for seasonal changes in chloride and sodium, overall groundwater chemistry at the UWL has remained relatively unchanged since 2006, which is at least four (4) years prior to the construction of the SCPC.

5.3.4 Piper Diagrams

A Piper diagram is a graphical technique used to classify and compare different groundwater sources. The same data used to generate the Stiff diagram are plotted on a ternary Piper diagram according to major cation and anion concentrations. In addition to showing instantaneous concentrations, Piper diagrams can be used to determine if groundwater chemistry is changing, either spatially or temporally. **Figures 13** and **14** are Piper diagrams displaying data from DG-2 and DG-4 relative to the major cation and anion concentrations from the June 2006.

As shown by the similar placement on the Piper diagrams, the data from November 2020 at DG-2 (**Figure 13)** display a similar distribution to that of the June 2006 data. **Figure 14** displays largely similar distributions at DG-4. The only notable difference between the two sampling events is the distribution of DG-4 results relative to the generalized plot of the June 2006 data. Events from 2018 through 2020 plot slightly higher on the sodium + potassium and chloride axes, causing them to be slightly shifted. As discussed above, sodium and chloride concentrations are seasonally dependent and are influenced by the use of road salt on the nearby Highway 94. Except for seasonal differences in chloride and sodium, overall groundwater chemistry at the UWL has remained relatively unchanged since 2006, which was four (4) years prior to the construction of the SCPC.

6.0 DEMONSTRATION THAT SSIs WERE NOT CAUSED BY SCPC IMPACT

Based on the information presented in Section 5 above, the SSIs for fluoride at DG-4 and calcium at DG-2 were not caused by groundwater influence from the SCPC. The SSIs appear to be caused by numerous factors, but are primarily caused by the following:

- Natural spatial and temporal variability in the alluvial aquifer sampling results that are influenced by pre-existing low-level CCR impacts.
- Relatively low calculated UPLs that do not reflect the full variability within the alluvial aquifer when compared to historical data for DG-2 or DG-4.

As required by the CCR Rule, eight (8) baseline samples were collected prior to the October 2017 deadline which were used to calculate the UPL at each compliance well around the SCPC. According to the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA 2009), eight (8) samples is the minimum number of samples recommended in order to complete statistical tests and future data will be used to enlarge the dataset for UPL calculation. In August 2019, the baseline data set used to calculate the UPLs was expanded, however, the background dataset of twelve (12) measurements is still relatively small compared to the amount of data that has been collected for these wells as part of the State UWL monitoring program. At the SCPC, previous data from State UWL monitoring program put the SSIs in context relative to historical groundwater conditions at the site.

As shown in Section 5, each of the SSIs was below historical results at that well. The dataset used to calculate the current UPLs were collected in a relatively short timeframe in accordance with the CCR Rule and had statistically lower results than typically found during historic UWL sampling at these wells. Therefore, the UPLs calculated from these data only represent the lower range of values in the overall population.

The comparison of key WFGD indicator parameters (sulfate and calcium), as well as other potential indicators (fluoride, boron, chloride, and sodium) between current groundwater conditions and those present prior to SCPC operations, support the conclusion that the SCPC is not the source of the SSIs. If impacts were caused by the SCPC, an increase in these parameters (particularly sulfate and calcium) would be expected, but this is not occurring.

Further, the construction of the SCPC, with 2-feet of compacted clay overlain by an 80-mil HDPE liner, also limits the likelihood that the SSIs are a result an impact from the SCPC. In addition, geochemical models displaying current and historical background chemistries which show little variation between the November 2020 and June 2006, which is four (4) years prior to in the construction of the SCPC.

In summary, there are no indications to support migration of CCR contaminants from the SCPC. Instead, the data indicate that the cause for the SSIs is due to alluvial aquifer variability, pre-existing CCR impacts, and a limited dataset available for the calculation of the UPL.

7.0 REFERENCES

Ameren Missouri. 2016. Structural Integrity Criteria & Hydrologic/Hydraulic Capacity Assessment, Sioux Energy Center.

Electric Power Research Institute (EPRI). 1998, Field Evaluation of the Comanagement of Utility Low-Volume Wastes With High-Volume Coal Combustion By-Products: SX Site. Report TRACE-108409. September 1998.

Electric Power Research Institute (EPRI). 2011, Composition and Leaching of FGD Gypsum and Mined Gypsum, Report 1022146. November 2011.

Electric Power Research Institute (EPRI). 2012, Groundwater Quality Signatures for Assessing Potential Impacts from Coal Combustion Product Leachate, Report 1017923. October 2012.

Electric Power Research Institute (EPRI). 2017, Guidelines for Development of Alternative Source Demonstrations at Coal Combustion Residual Sites, Report 3002010920, October 2017.

Golder Associates Inc., 2017, 40 CFR Part 257 Groundwater Monitoring Plan, SCPC – Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2018, 2017 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2019a, 2018 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2019b, Updated Statistical Limits With Additional Background Data – SCPC.

Golder Associates Inc., 2020, 2019 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2021, 2020 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

GREDELL Engineering Resources, Inc. 2006. Detailed Geologic and Hydrologic Site Investigation Report. AmerenUE Sioux Power Plant Proposed Utility Waste Disposal Area. St. Charles County, Missouri. Aug 2006.

GREDELL Engineering Resources, Inc. 2009. Background Groundwater Monitoring Report. AmerenUE Sioux Power Plant. St. Charles County, Missouri. June 2009.

Johnson, A.I. 1967. Specific Yield – Compilation of Specific Yields for Various Materials: U.S. Geological Survey Water-Supply Paper 1662-D. Available at: https://pubs.er.usgs.gov/publication/wsp1662D.

MDNR. 2011. Missouri Well Construction Rules. Missouri Department of Natural Resources Division of Geology and Land Survey. Rolla, MO. August 2011.

Reitz & Jens, Inc., and GREDELL Engineering Resources, Inc. 2014. Ameren Missouri Sioux Power Plant – Utility Waste Landfill – Proposed Construction Permit Modification – Construction Permit Number 0918301 – St. Charles County, Missouri, revised August 2014.

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Resource Conservation and Recovery – Program Implementation and Information Division. March.

USEPA. 2015. Federal Register. Volume 80. No. 74. Friday April 17, 2015. Part II. Environmental Protection Agency. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule/ [EPA-HQ-RCRA-2009-0640; FRL-9919-44-OSWER].

Tables

Table 1
November 2020 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
November 2020 Detection Monitoring Event															
DATE	NA	11/16/2020	11/16/2020	NA	11/17/2020	NA	11/17/2020	NA	11/17/2020	NA	11/17/2020	NA	11/17/2020	NA	11/16/2020
pH	SU	6.96	7.07	6.436-7.44	7.05	6.63-7.528	7.32	6.714-7.386	7.09	6.773-7.387	7.12	6.355-7.543	7.02	6.527-7.384	7.13
BORON, TOTAL	µg/L	75.1 J	66.3 J	327	148	208.9	149	130.1	80.9 J	127.6	83.4 J	126	90.6 J	119.5	77.4 J
CALCIUM, TOTAL	µg/L	141,000	125,000	177,869	139,000	129,922	108,000	142,166	119,000	139,133	145,000	156,515	160,000	143,189	132,000 J
CHLORIDE, TOTAL	mg/L	7.0	11.4	145.9	87.2	108.8	20.6	11.18	1.3	9.596	3.1	16.74	3.8	119.9	68.5
FLUORIDE, TOTAL	mg/L	0.34	0.40	0.3643	0.30	0.3308	0.24	0.3797	0.35	0.4315	0.35	0.4424	0.42	0.37	0.41
SULFATE, TOTAL	mg/L	24.8	30.6	107.8	48.5	83.09	47.9	60.32	11.0	45.51	28.7	59.31	41.0	62.54	37.1
TOTAL DISSOLVED SOLIDS	mg/L	505	455	833.4	642	626	448	555.4	441	524.9	546 J	624.7	598	701	637
January 2021 Verification Sampling Event															
DATE	NA										1/8/2021		1/8/2021		1/8/2021
pH	SU														
BORON, TOTAL	µg/L														
CALCIUM, TOTAL	µg/L										141,000 J		155,000		
CHLORIDE, TOTAL	mg/L														
FLUORIDE, TOTAL	mg/L														0.45
SULFATE, TOTAL	mg/L														
TOTAL DISSOLVED SOLIDS	mg/L										509				

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: JSI
Checked By: EMS
Reviewed By: SCP

Table 5
Major Cation and Anion Concentrations
SCPC - Alternative Source Demonstration
Sioux Energy Center, St. Charles County, MO

Monitoring Well ID	Total Sodium (mg/L)	Total Potassium (mg/L)	Total Calcium (mg/L)	Total Magnesium (mg/L)	Total Chloride (mg/L)	Total Sulfate (mg/L)	Total Alkalinity [(2)] (mg/L)
Detection Monitoring - November 2020							
S-BMW-1S	4.80	0.366	141	27.8	7.0	24.8	422
S-BMW-3S	5.25	0.440	125	23.0	11.4	30.6	378
S-DG-1	3.73	3.66	119	29.2	1.3	11.0	394
S-DG-2	4.54	6.02	145	28.4	3.1	28.7	410
S-DG-3	5.54	6.58	160	38.4	3.8	41.0	451
S-DG-4	35.4	8.10	132 J	42.0	68.5	37.1	457
S-UG-1A	35.7	10.60	139	33.4	87.2	48.5	403
S-UG-2	30.6	4.82	108	24.6	20.6	47.9	315
Historical Data - June 2006							
PZ-2	3.8	2.8	120	32	36	6.6	420
PZ-3	5.4	5.2	140	27	12	53	440
PZ-10	3.4	3.9	99	31	4.6	43	370
PZ-25	4.2	4.9	120	38	19	29	470

Notes:

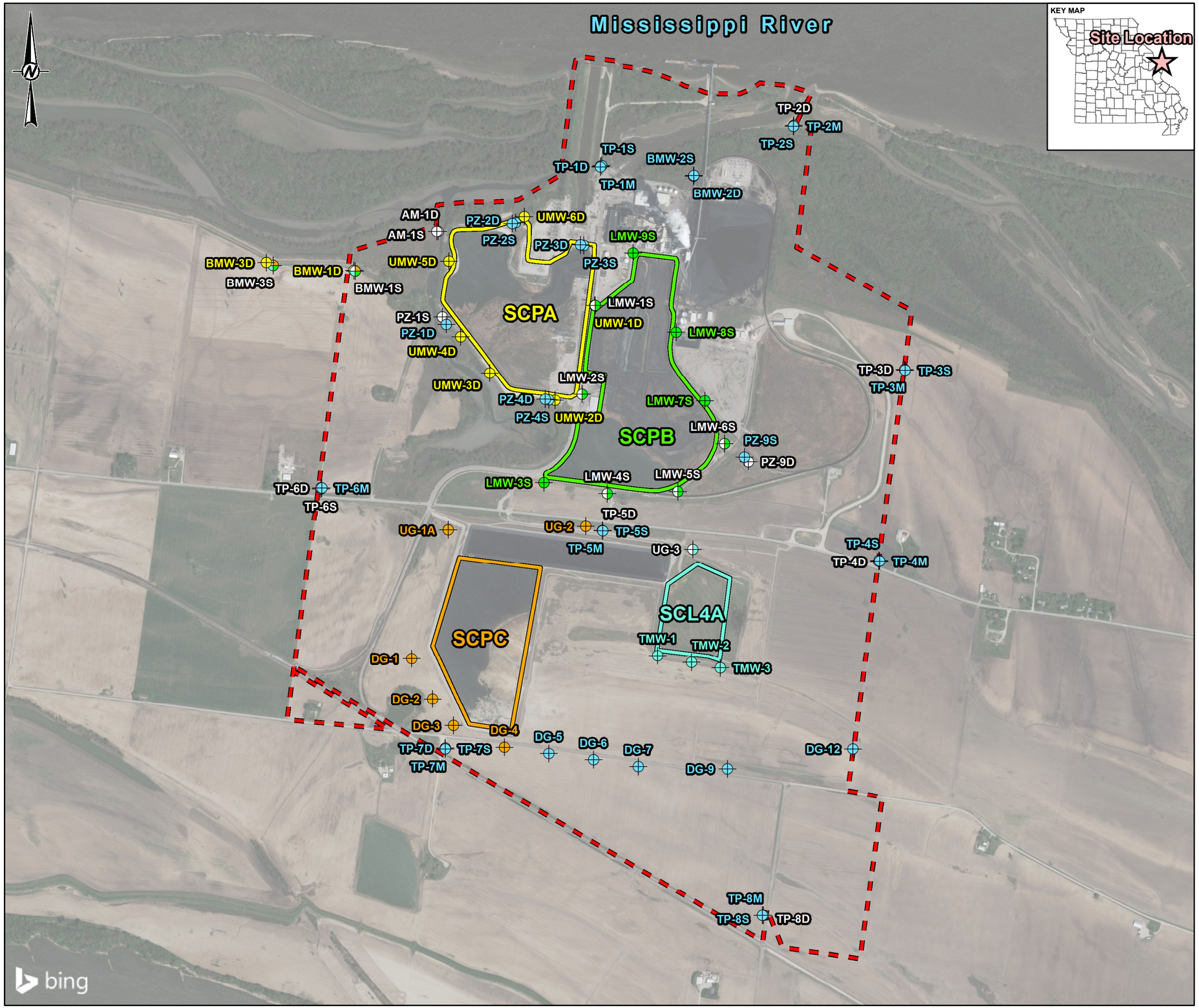
1) 2006 Historical Data from Appendix 13 of the Detailed Site Investigation (DSI).

2) Alkalinity is equal to Carbonate + Bicarbonate.

3) mg/L - milligrams per liter.

Prepared By: EMS
Checked By: BTT
Reviewed By: MNH

Figures



KEY MAP

LEGEND

- Sioux Energy Center Property Boundary
- SCPA - Bottom Ash Surface Impoundment
- SCPB - Fly Ash Surface Impoundment
- SCPC - WFGD Disposal Area
- SCL4A - Dry CCR Disposal Area

Monitoring Well Networks

- Corrective Action Monitoring Well
- SCPA Detection and Assessment Monitoring Well
- SCPB Detection Monitoring and SCPA Corrective Action Monitoring Well
- SCPB Detection Monitoring Well
- SCPB, SCPC and SCL4A Detection Monitoring and SCPA Corrective Action Monitoring Well
- SCPC Detection Monitoring Well
- SCL4A Detection Monitoring and SCPA Corrective Action Monitoring Well
- SCL4A Detection Monitoring Well
- Monitoring Well Used for Water Level Elevation Measurements

0 1,000 2,000 3,000

Feet

NOTE(S)

1.) ALL BOUNDARIES AND LOCATIONS ARE APPROXIMATE.
2.) WFGD - WET FLUE GAS DESULFURIZATION.

REFERENCE(S)

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SITE MONITORING WELL LOCATION AND AERIAL MAP

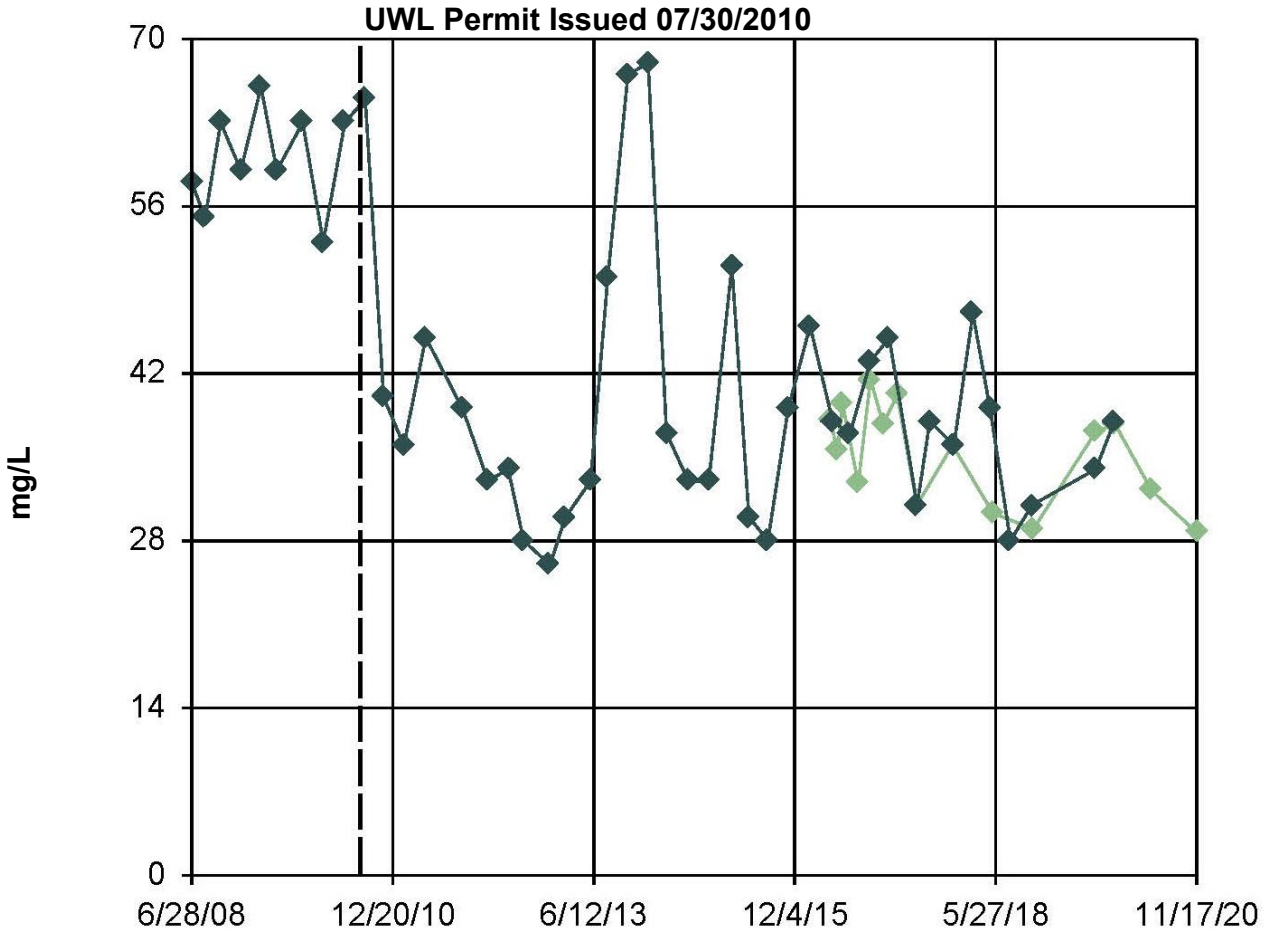
CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-12
DESIGNED	JSI
PREPARED	BTT
REVIEWED	EMS
APPROVED	MNH

PROJECT NO.	CONTROL	REV.	FIGURE
153140603	1240	0	1

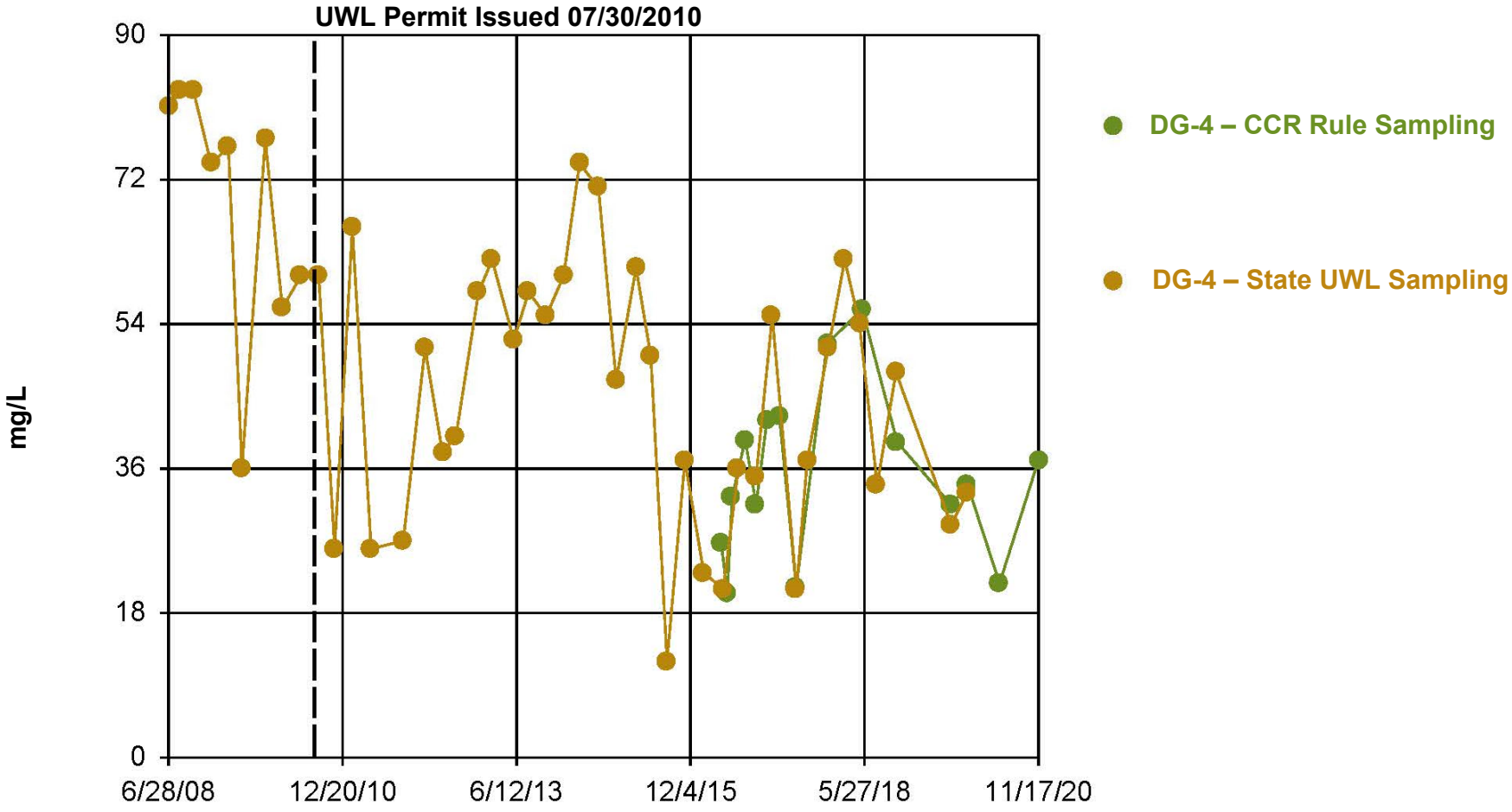
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: C:\Users\ESchneider\Golder Associates\153140603\01_02 - Ameren CCR GW Monitoring Program 2020 - 153141106 - All Project Files (1)\5 Technical Work\0003-SEC\3.5-Figures-Drawings\PRODUCTION\Other Maps\Figure 3 - CCR WELL PROGRAMS - Copy.mxd PRINTED ON: 2021-01-22 AT 4:28:44 PM



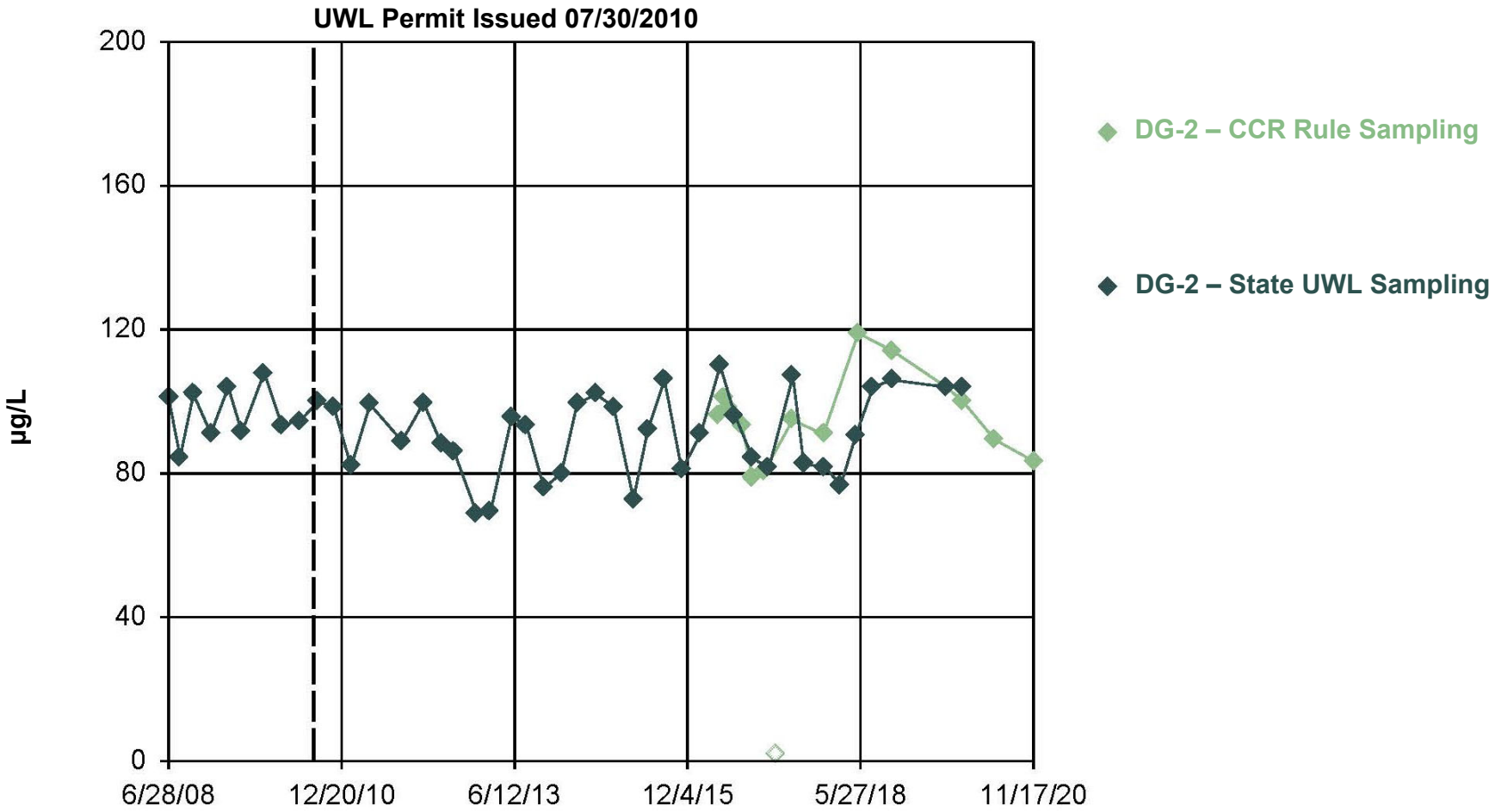
Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER			**Sulfate Time Series Plot at DG-2**		
DRAWN EMS	CHECKED RJF	REVIEWED MNH	DATE 2021-02-17	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **2**



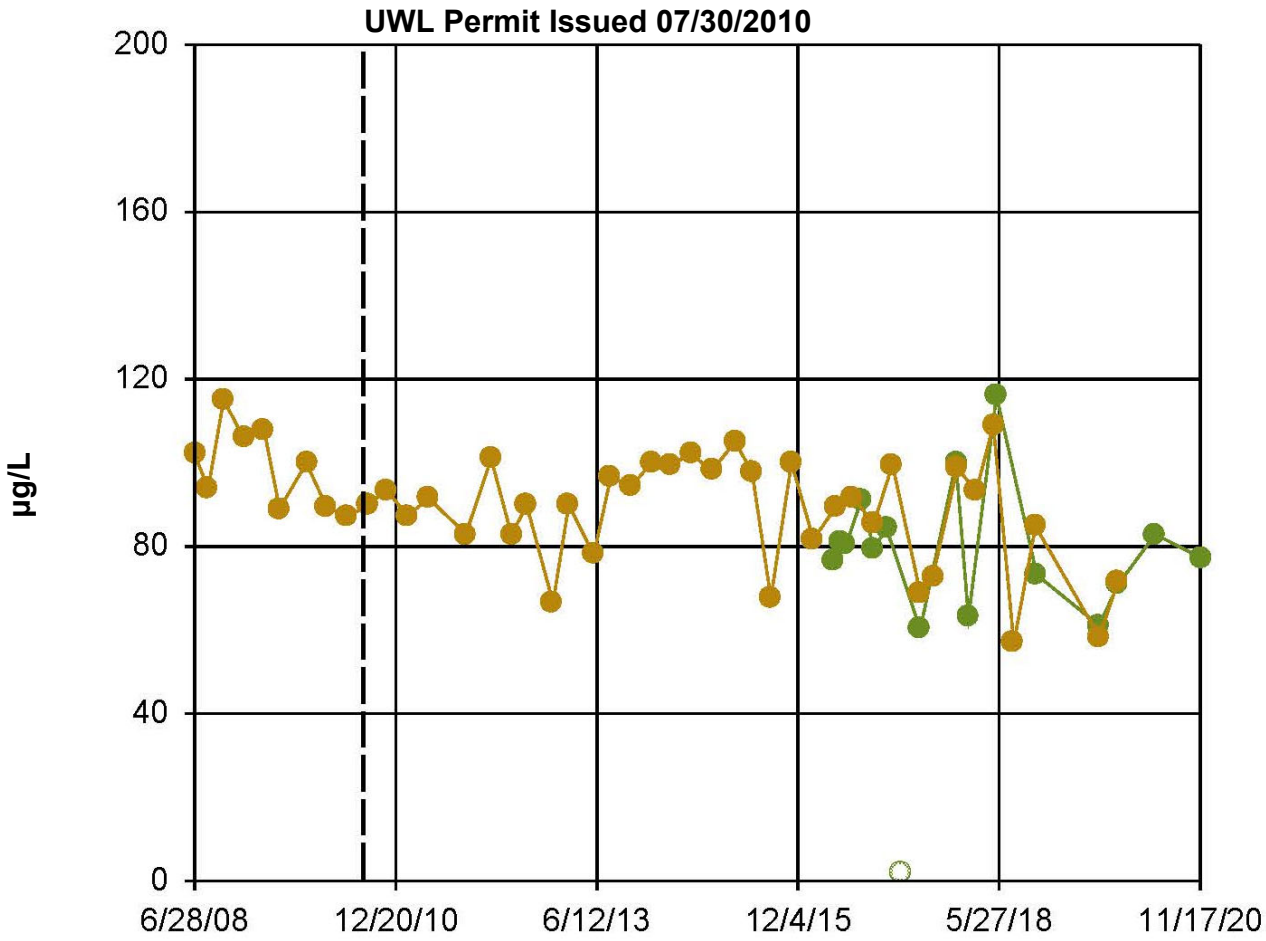
Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER			**Sulfate Time Series Plot at DG-4**		
DRAWN EMS	CHECKED RJF	REVIEWED MNH	DATE 2021-02-17	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **3**



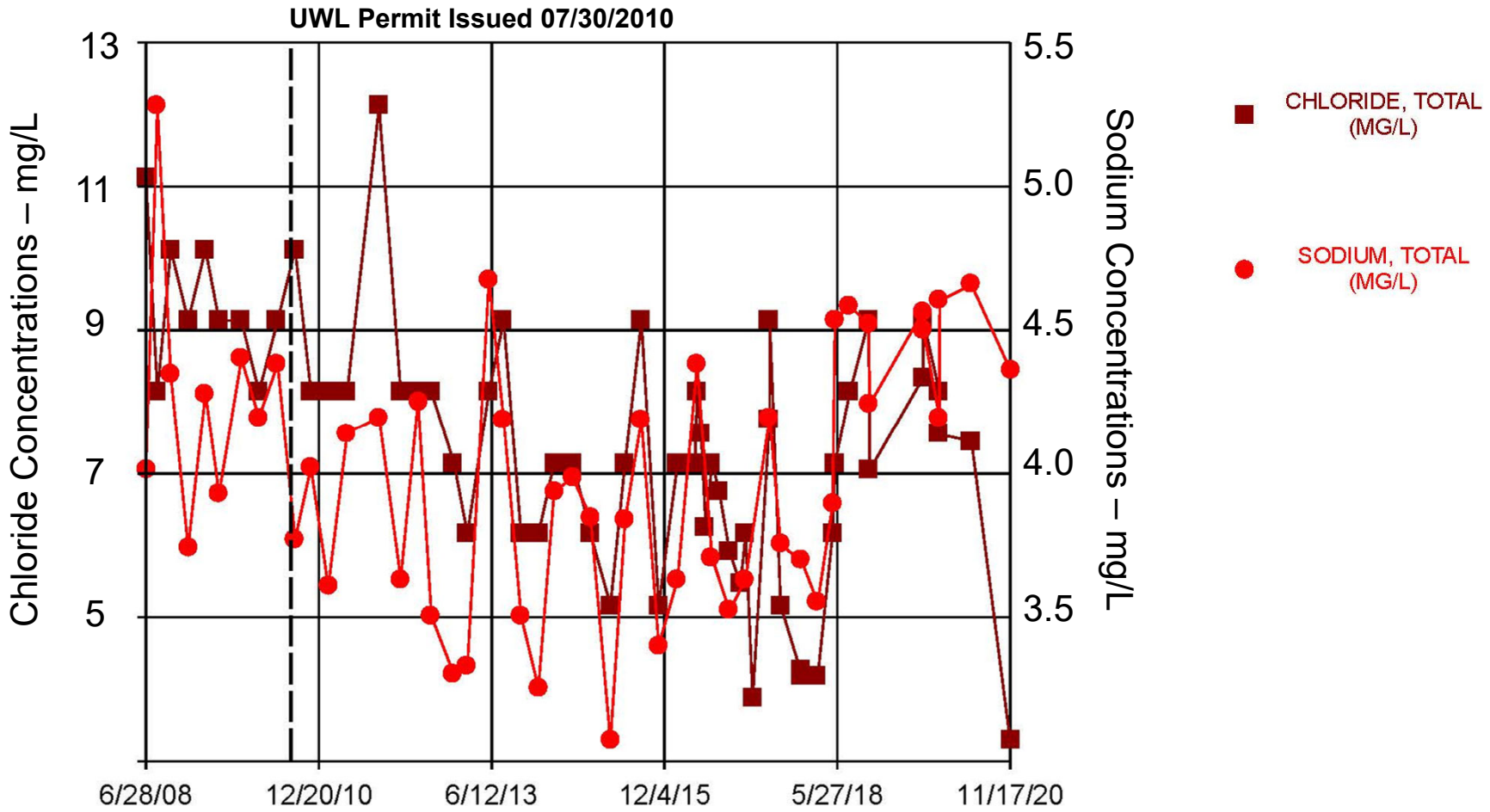
Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT								TITLE	
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER				**Boron Time Series Plot at DG-2**	
DRAWN EMS	CHECKED RJF	REVIEWED MNH	DATE 2021-02-17	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **4**



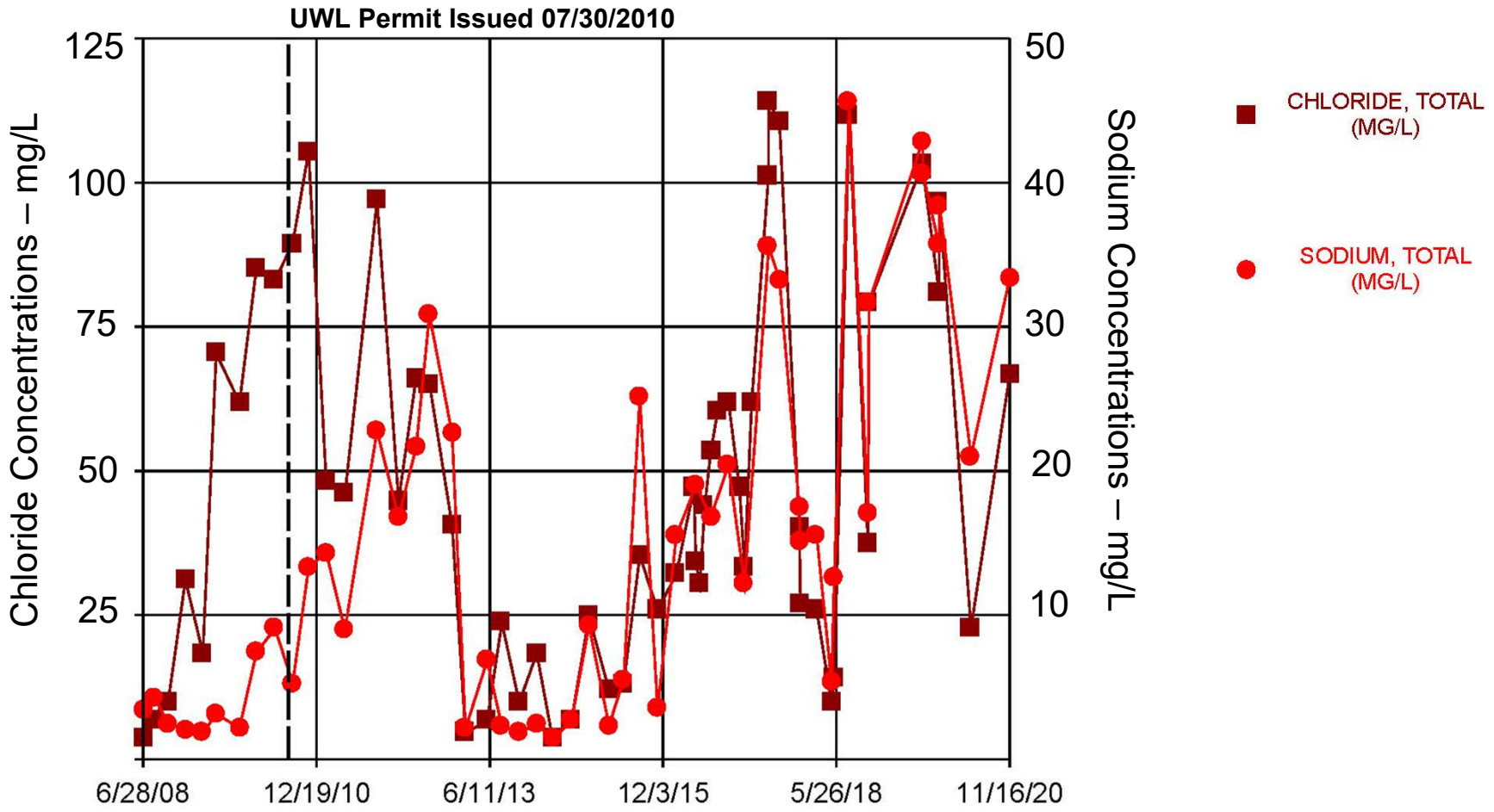
Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**			GOLDER				**Boron Time Series Plot at DG-4**		
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
EMS	RJF	MNH	2021-02-17	N/A	N/A	153140603.0003	N/A	N/A	N/A	**5**



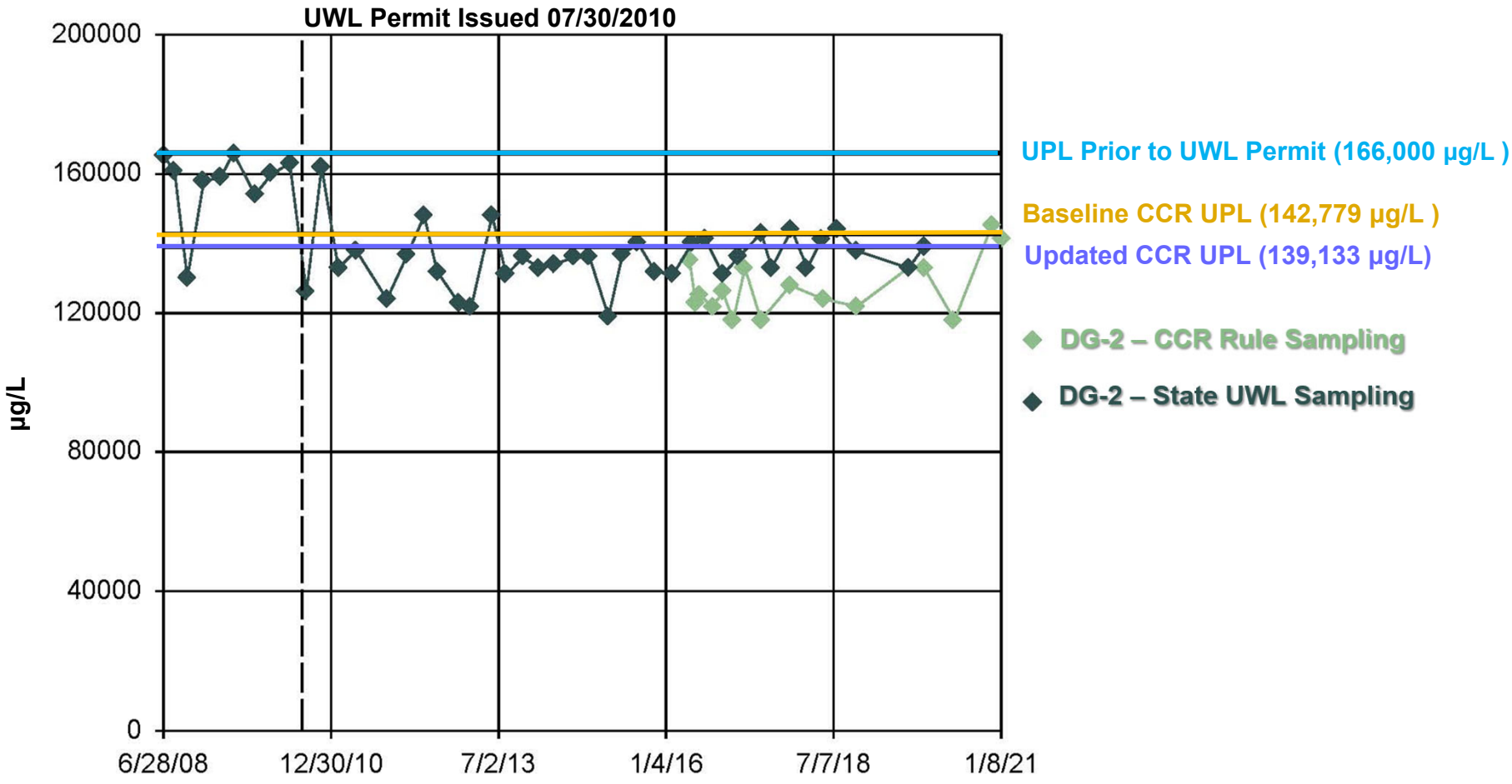
Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT **AMEREN MISSOURI SIOUX ENERGY CENTER**				GOLDER			TITLE **DG-2 Time Series Plot Comparing Chloride and Sodium**			
DRAWN EMS	CHECKED BTT	REVIEWED MNH	DATE 2021-03-22	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **6**



Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

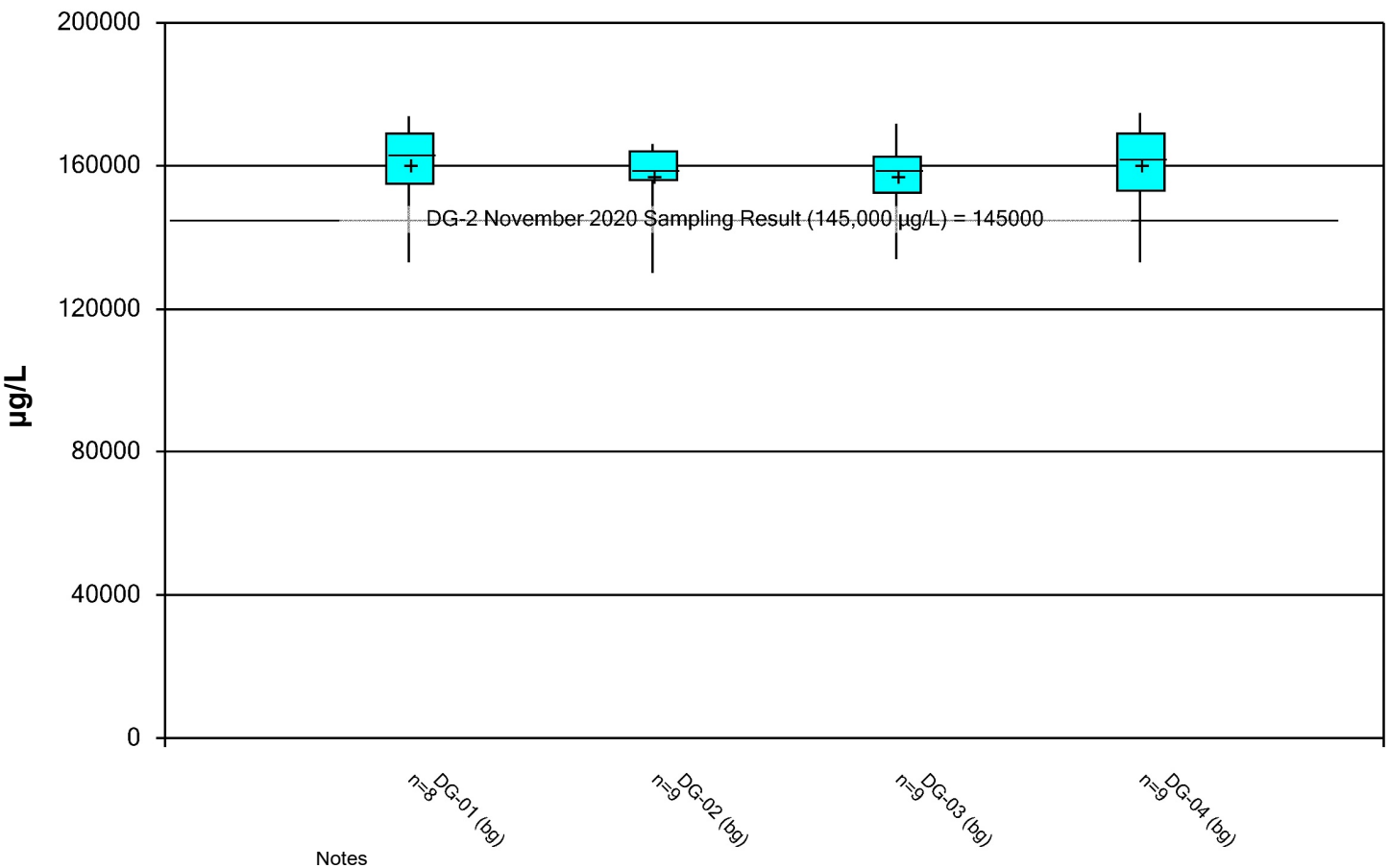
CLIENT/PROJECT							TITLE	
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER			**DG-4 Time Series Plot Comparing Chloride and Sodium**	
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
EMS	BTT	MNH	2021-03-22	N/A	N/A	153140603.0003	N/A	N/A	N/A	**7**



Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER			**Calcium Time Series Plot at DG-2**		
DRAWN EMS	CHECKED RJF	REVIEWED MNH	DATE 2021-03-22	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **8**

Box & Whiskers Plot



Notes
1) µg/L – Micrograms per liter.
2) Box and whisker plot was generated using Sanitas software.

CLIENT/PROJECT **AMEREN MISSOURI SIOUX ENERGY CENTER**				GOLDER			TITLE **Box and Whisker Plot – Calcium – Pre CCR-Placement**			
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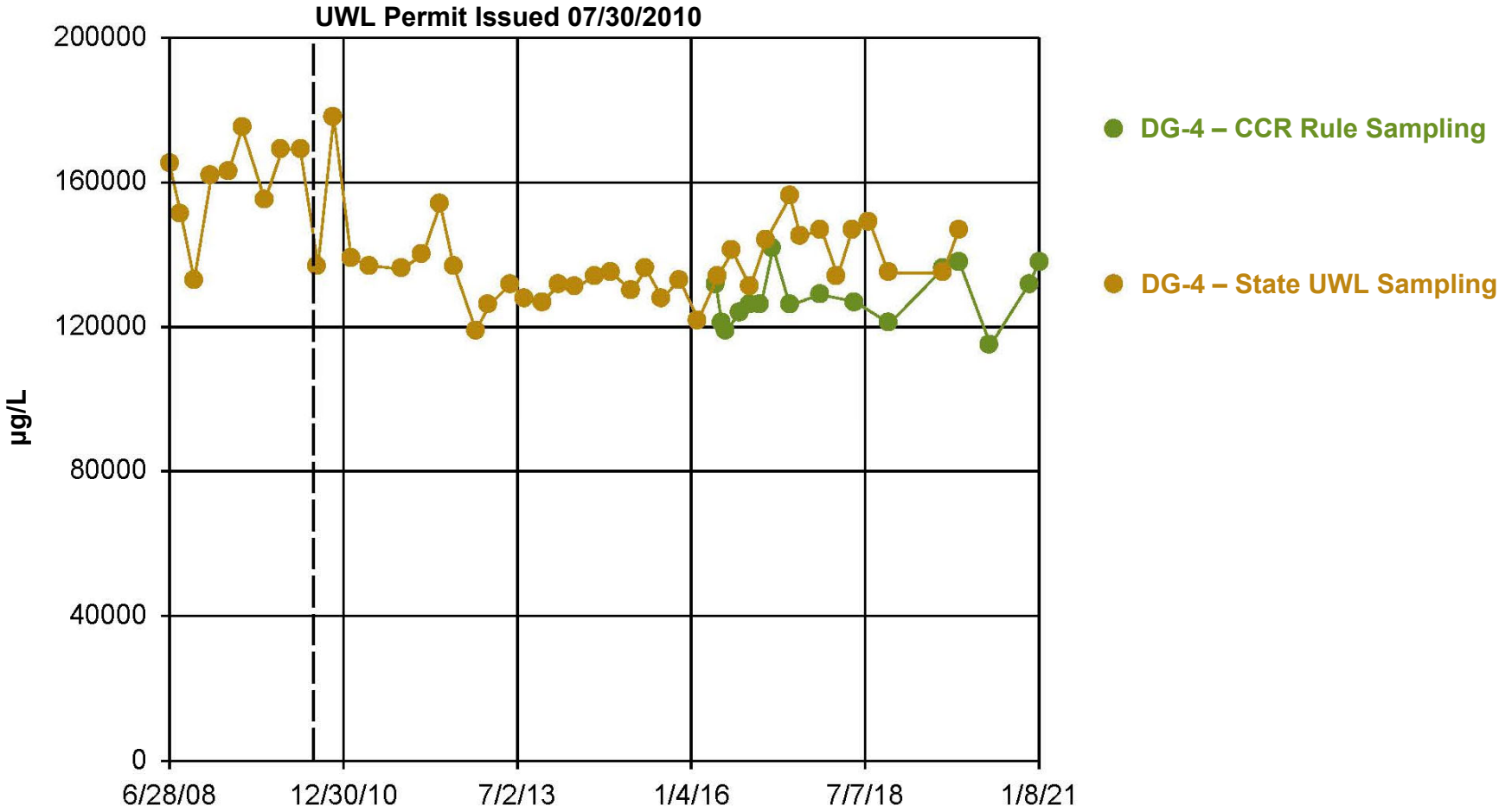
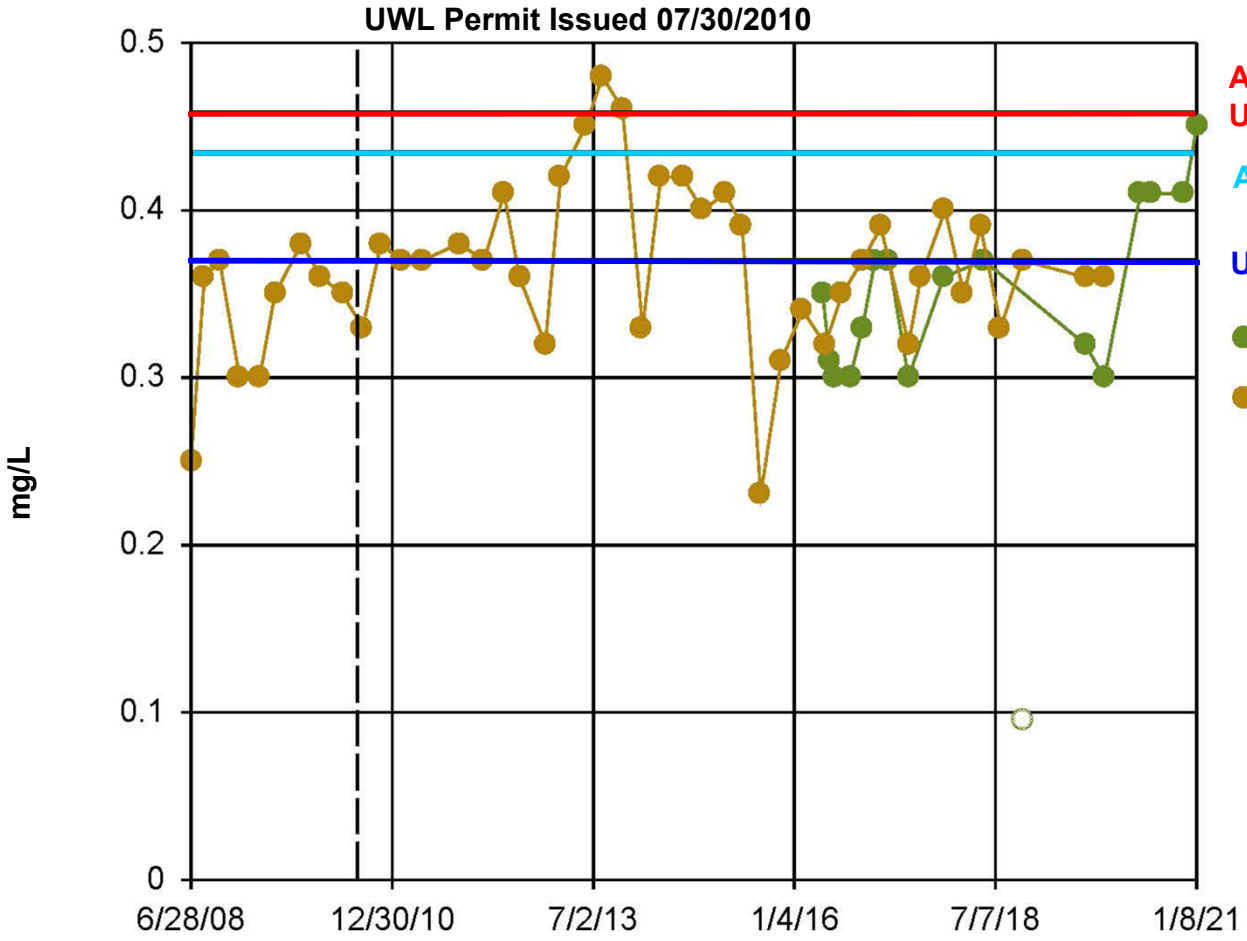


Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

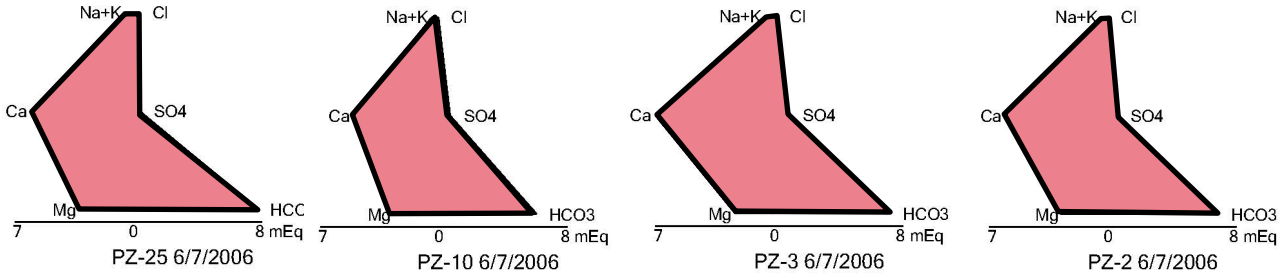
CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER			**Calcium Time Series Plot at DG-4**		
DRAWN EMS	CHECKED RJF	REVIEWED MNH	DATE 2021-03-22	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **10**

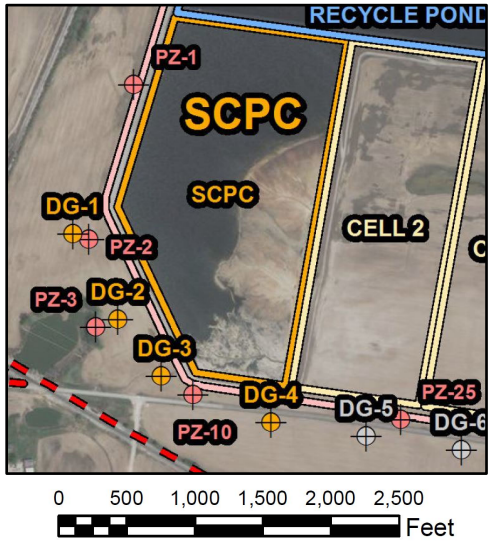


Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.
4) UPL – Upper Prediction Limit.

CLIENT/PROJECT								TITLE	
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER				**Fluoride Time Series Plot at DG-4**	
DRAWN EMS	CHECKED RJF	REVIEWED MNH	DATE 2021-03-22	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **11**

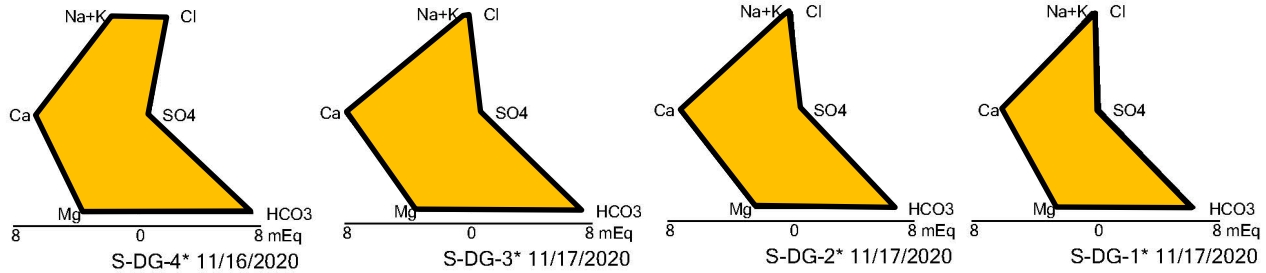
June 2006 Stiff Diagrams





Stiff Diagram Location Map

November 2020 Stiff Diagrams



Notes
1) June 2006 Historical Zone data from Appendix 13 of the Detailed Geologic and Hydrologic Site Investigation Report.
2) Stiff diagrams were generated using Sanitas software.

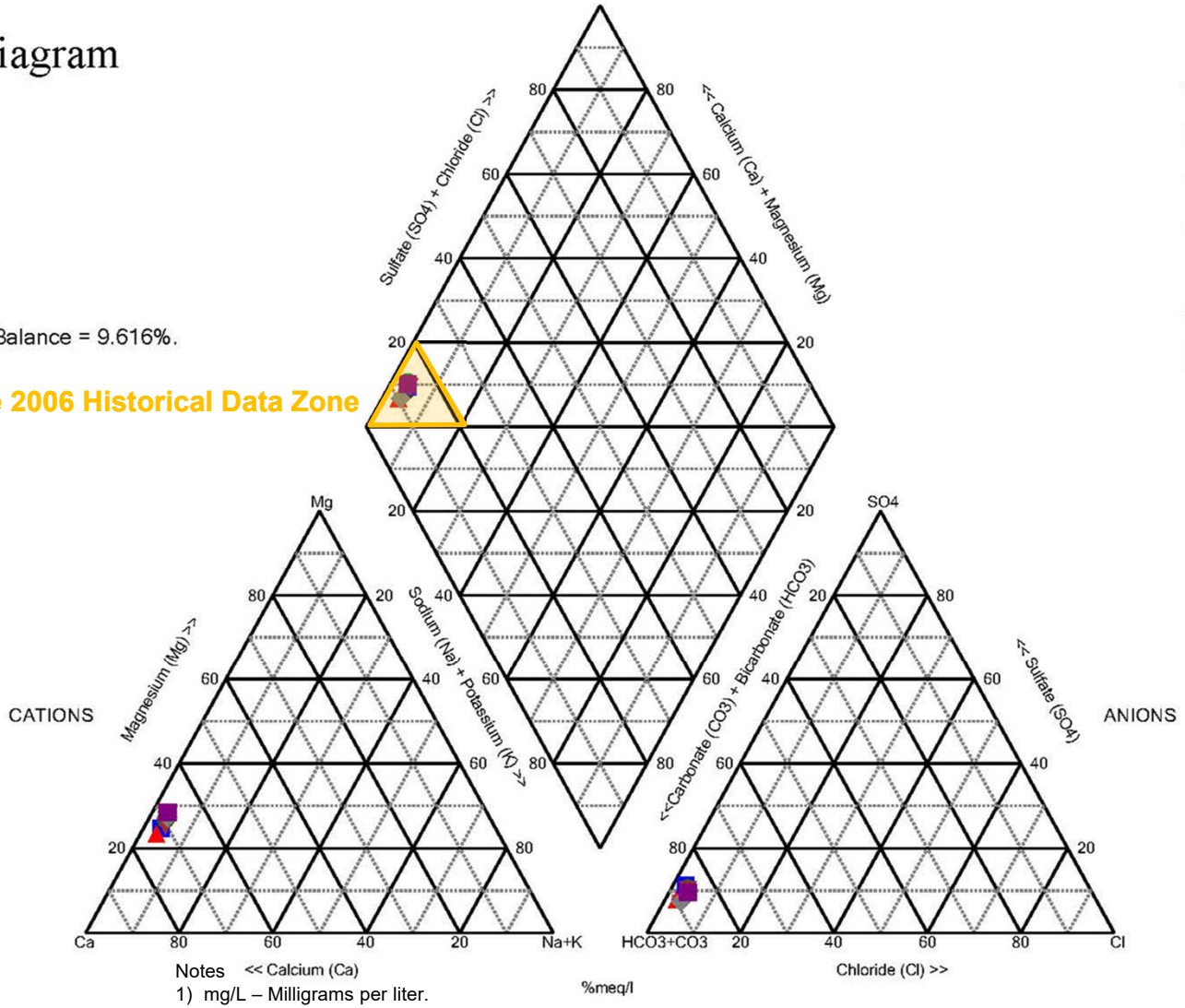
CLIENT/PROJECT					TITLE					
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER	**Stiff Diagram – June 2006 vs November 2020 Results**					
DRAWN EMS	CHECKED BTT	REVIEWED MNH	DATE 2021-03-22	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **12**

Piper Diagram

S-DG-2 (bg)

Cation-Anion Balance = 9.616%.

June 2006 Historical Data Zone



Notes

1) mg/L – Milligrams per liter.
2) June 2006 Historical Zone data from Appendix 13 of the Detailed Geologic and Hydrologic Site Investigation Report.
3) Piper diagram was generated using Sanitas software.

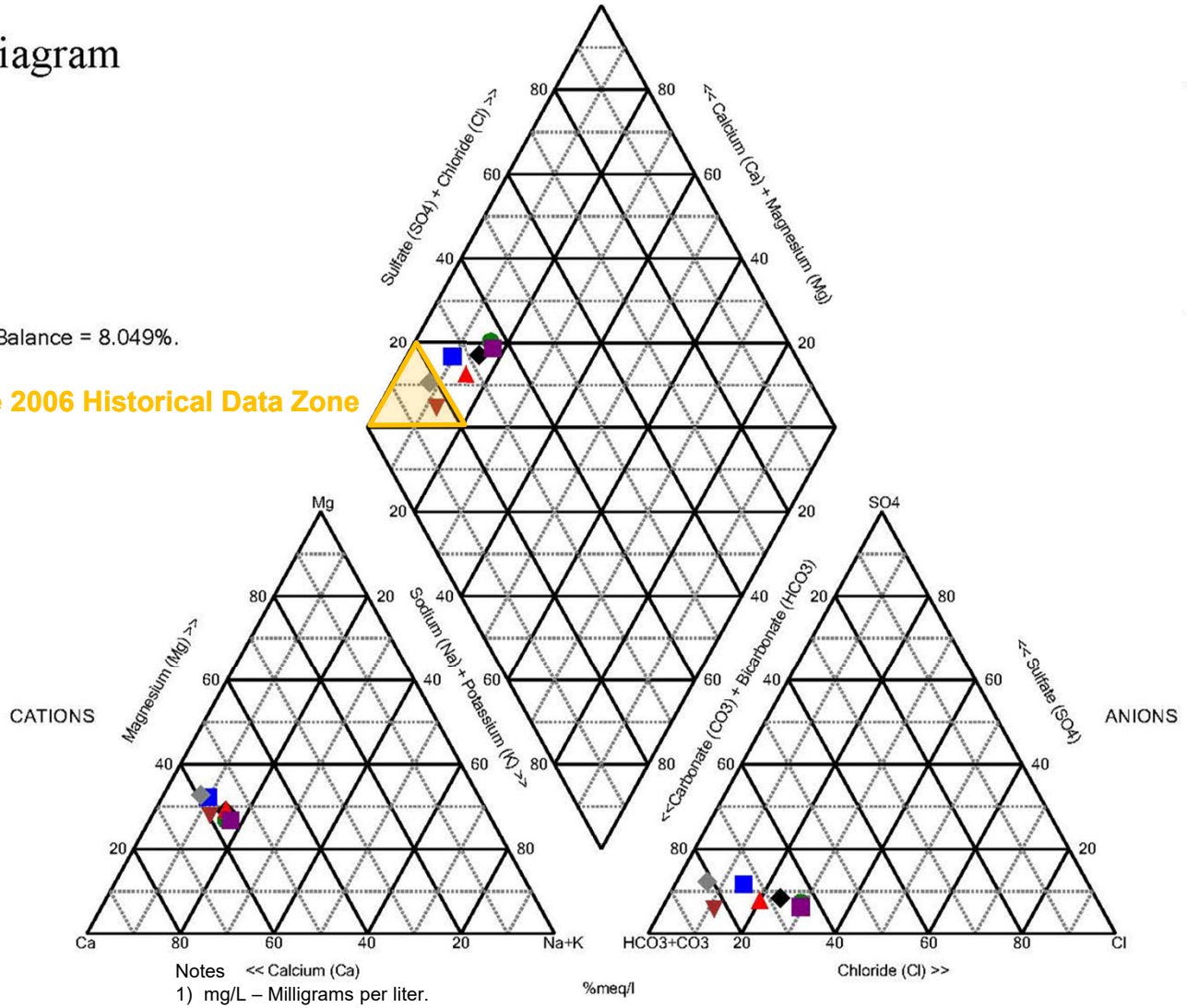
CLIENT/PROJECT							TITLE			
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER			**Piper Diagram – DG-2**			
DRAWN EMS	CHECKED BTT	REVIEWED MNH	DATE 2021-03-22	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **13**

Piper Diagram

S-DG-4 (bg)

Cation-Anion Balance = 8.049%.

June 2006 Historical Data Zone



Notes

1) mg/L – Milligrams per liter.
2) June 2006 Historical Zone data from Appendix 13 of the Detailed Geologic and Hydrologic Site Investigation Report.
3) Piper diagram was generated using Sanitas software.

CLIENT/PROJECT							TITLE			
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER			**Piper Diagram – DG-4**			
DRAWN EMS	CHECKED BTT	REVIEWED MNH	DATE 2021-03-22	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **14**

golder.com

APPENDIX C

Alternative Source Demonstration - April 2021 Sampling Event

GOLDER
MEMBER OF WSP

REPORT

SCPC - Alternative Source Demonstration

Sioux Energy Center, St. Charles County, Missouri, USA

Submitted to:

Ameren Missouri
1901 Chouteau Ave, St. Louis, MO 63103

Submitted by:

Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021

+1 314 984-8800

153140603

November 9, 2021

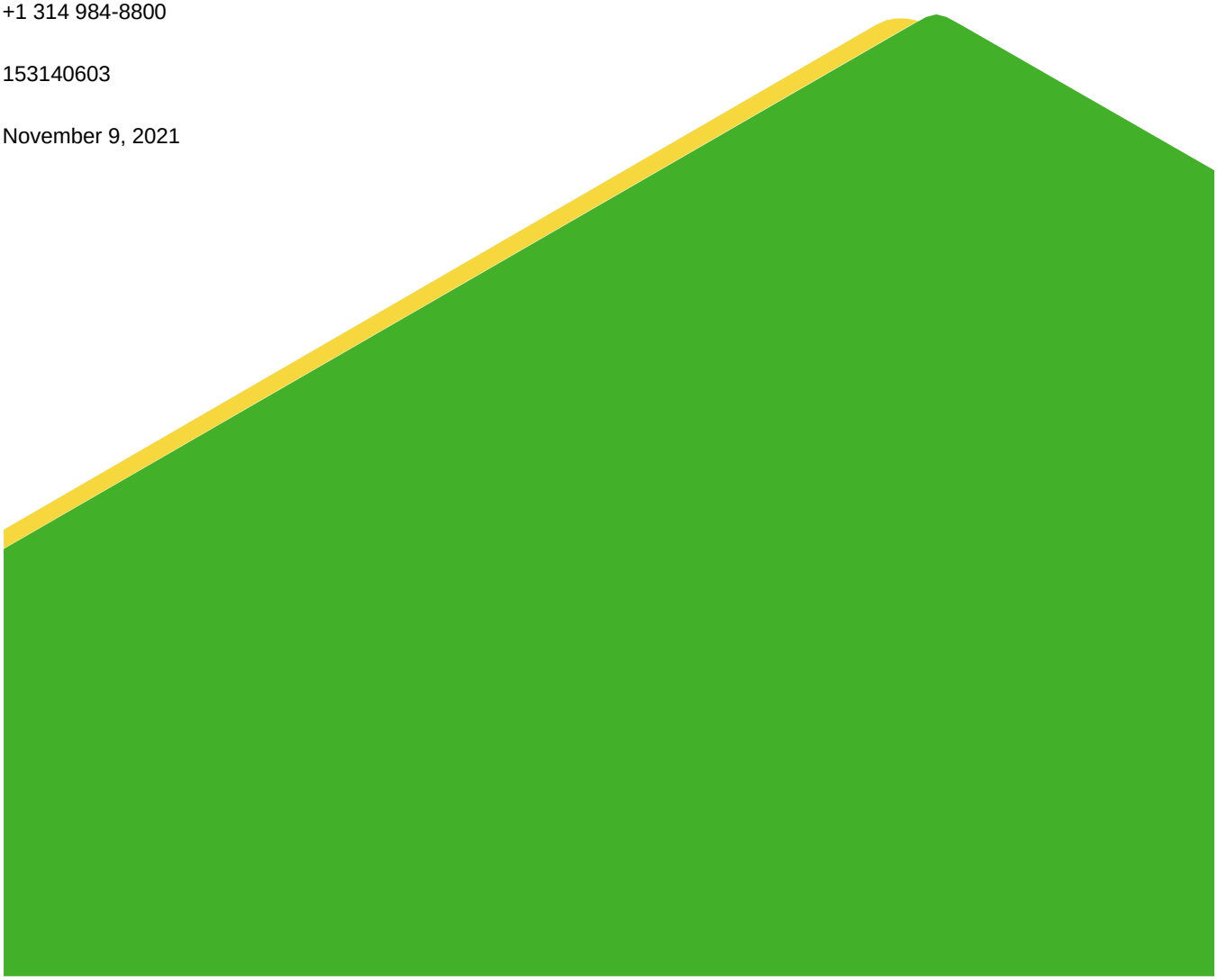


Table of Contents

TABLES

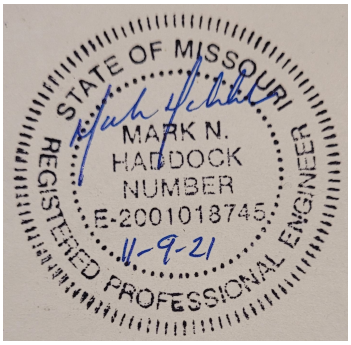
FIGURES

1.0 CERTIFICATION STATEMENT

This *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule) under the direction of a licensed professional engineer with Golder Associates Inc.

I hereby certify that this *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* located at 8501 Missouri 94, West Alton, Missouri 63386 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

GOLDER ASSOCIATES INC.



Mark Haddock, P.E., R.G.

Principal, Practice Leader

2.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this *SCPC – Alternative Source Demonstration* has been prepared to document an Alternative Source Demonstration (ASD) for two Statistically Significant Increases (SSIs) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPC Cell 1. This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.0 SITE DESCRIPTION AND BACKGROUND

Ameren owns and operates the SEC in St. Charles County, Missouri located approximately 12 miles west-northwest of the confluence of the Mississippi and Missouri Rivers. **Figure 1** depicts the site location and layout, including the location of SCPC. The SEC is approximately 1,025 acres and is located in the floodplain between the Mississippi and Missouri Rivers. The SEC is bounded to the north by wooded areas associated with the Mississippi River; to the south by a railroad; and to the east and west by agricultural fields.

3.1 Geological and Hydrogeological Setting

Hydrogeologically, the SCPC lies between the Mississippi River to the north and the Missouri River to the south. Flow and deposition from these rivers have resulted in thick alluvial deposits which lie unconformably on top of bedrock. These alluvial deposits range from approximately 100 to 130 feet thick and comprise the uppermost aquifer, called the alluvial aquifer. Overall, this aquifer is described as a fining upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Drilling in the alluvial aquifer identified different sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are highly variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region includes Mississippian-aged rocks of the Meramecian Series. Formations include primarily limestone, dolomite, and shale and are comprised of the Salem Formation overlying the Warsaw Formation and the Burlington-Keokuk Formation.

3.2 Utility Waste Landfill Cell 1 - SCPC

UWL Cell 1 is referred to by Ameren as the SCPC, or "Gypsum Pond" Cell 1. The SCPC is approximately 37.5 acres in size and is located south of the generating plant on the south side of Highway 94 (**Figure 1**). The CCR Unit manages CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD) which began operation in 2010.

The WFGD process occurs after the removal of slag and fly ash where a crushed limestone ($CaCO_3$) mix is introduced into the boiler flue gas flow. The limestone reacts with the sulfur dioxide (SO_2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate ($CaSO_4 * 2H_2O$)). The resultant gypsum material is wet sluiced from the plant across the highway to the SCPC. Once there, the gypsum dewaters by gravity with the sluice conveying water recycled back to the WFGD for reuse. The primary soluble constituents of the gypsum CCR are sulfate, calcium, chloride, and sodium (Gredell and Reitz & Jens, 2014).

The SCPC was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by an 80-mil HDPE geomembrane liner. Information on the design of the UWL is available in the 2014 Proposed Construction Permit Modification, Construction Permit Number 0918301 (Gredell and Reitz & Jens, 2014).

A groundwater monitoring well network was installed in 2007 and 2008 in order to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of sixteen (16) monitoring wells ringing the current and proposed future extents of the UWL (**Figure 1**). These monitoring wells are installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for groundwater. Quarterly groundwater samples have been collected in these monitoring wells since June 2008 for the state required UWL parameters.

The permit for the SCPC was issued July 30, 2010 (permit #0918301). Nine (9) sampling events were performed prior to July 30, 2010 and represent groundwater quality prior to WFGD placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, the following were completed prior to the October 17, 2017 deadline: (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and (4) eight (8) baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPC consists of eight (8) monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Six (6) existing monitoring wells (UG-1A, UG-2, DG-1, DG-2, DG-3, and DG-4) were installed by Gredell Engineering Resources, Inc. in December 2007 and June 2008 as a part of the state UWL state monitoring program. The remaining monitoring wells (BMW-1S and BMW-3S) were installed by Golder in 2016 for CCR Rule groundwater monitoring purposes. More information on the design and installation of the monitoring wells is provided in the SCPC GMP (Golder, 2017) and the SCPC 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight (8) baseline sampling events were completed for the SCPC. After baseline sampling, the first detection monitoring event was completed in November of 2017. The following Appendix III constituents were sampled during detection monitoring:

- Boron
- Calcium
- Chloride
- pH
- Sulfate
- Total Dissolved Solids (TDS)
- Fluoride

In January 2018, background results from the eight (8) baseline sampling events were used to calculate statistical upper prediction limits (UPLs). These UPLs were then compared to the detection monitoring results from the November 2017 samples and subsequent semi-annual detection monitoring sampling events. If results from the

detection monitoring event were higher than the calculated UPL, it was considered to be an initial exceedance, in which case a verification sample was then collected and tested in accordance with the SCPC Statistical Analysis Plan (SAP). In August 2019, the background dataset used to calculate statistical limits was expanded to include the first four detection monitoring events, per the SAP. The updated UPLs were then used for the November 2019 and subsequent detection monitoring events. The following provides a summary of the detection monitoring results to date.

- In November 2017, initial exceedances were identified for fluoride at UG-2 and boron at DG-4. Verification sampling results confirmed a Statistically Significant Increase (SSI) for fluoride at UG-2. An ASD was prepared which demonstrated that the SSI for fluoride at UG-2 was primarily caused by natural temporal and spatial variability in the aquifer, a relatively low calculated UPL (when compared to historical data from this well), and low fluoride results that are near the laboratory practical quantitation limit (PQL).
- In May 2018, three (3) initial exceedances were reported for boron at DG-1, DG-3, and DG-4. None were confirmed by verification sampling.
- In November 2018, five (5) initial exceedances were reported for: pH at DG-1, DG-2, and DG-3; boron at DG-1; and sulfate at DG-3. None were confirmed by verification sampling.
- For the August 2019 sampling event, four (4) initial exceedances were reported for: calcium and chloride at UG-1A; fluoride at UG-2; and sulfate at DG-3. All except sulfate at DG-3 were confirmed by verification sampling. An ASD was prepared that demonstrated that the August 2019 SSIs were primarily due to: alluvial aquifer variability of pre-existing impacts, laboratory method accuracy, and limited baseline data available for the calculation of the UPL.
- In November 2019, one (1) initial exceedance was reported for pH at DG-2 that was not confirmed by verification sampling.
- For the April 2020 sampling event, three (3) initial exceedances were reported for fluoride at UG-1A, DG-1, and DG-4. Only fluoride at DG-4 was confirmed by verification sampling. An ASD was prepared that demonstrated that the SSI fluoride at DG-4 was primarily caused by natural temporal and spatial variability in the alluvial aquifer, sampling results that are influenced by pre-existing low-level CCR impacts, and a relatively low calculated UPL.
- In November 2020, four (4) initial exceedances were reported for: calcium at DG-2 and DG-3; fluoride at DG-4; and TDS at DG-2. Only calcium at DG-2 and fluoride at DG-4 were confirmed by verification sampling. An ASD was prepared that demonstrated exceedances of calcium at DG-2 and fluoride at DG-4 were the result of natural spatial and temporal variability in the alluvial aquifer, where sampling results were influenced by pre-existing low level CCR impacts, as well as a relatively low calculated UPL.
- In April 2021, three (3) initial exceedances were reported for: sulfate at DG-3; calcium DG-4; and TDS at DG-4. Calcium at DG-4 and TDS at DG-4 were confirmed by verification sampling. The results from the April 2021 detection monitoring event are summarized in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Two SSIs were determined during the April 2021 sampling event for Calcium and TDS at DG-4. Monitoring well DG-4 is screened in the upper portion of the alluvial aquifer, just below the average seasonal low for groundwater. As shown in **Figure 1**, DG-4 is located south of the SCPC, south of the generating plant and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

Based on Golder's review of the pre-disposal data (discussed in Section 3.2 above), as well as our comparison of the pre-disposal data with the results from the eight CCR-rule baseline events, it was concluded that the groundwater at the SCPC contained low-level pre-existing impacts from CCR that pre-dated SCPC construction and operation. As a result of these pre-existing impacts, the SCPC statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from the background wells, such that individual limits are calculated for each constituent in each well in the monitoring program. A summary table of the April 2021 SSIs are provided in **Table 2** and a brief description each is provided in the following sections.

Table 2: Review of Statistically Significant Increases

Constituent	Well ID	UPL Based on Baseline Events	August 2019 Updated UPL	Baseline Sampling Event Range	State UWL Program Sampling Events Range	April 2021 Results	June 2021 Results
Calcium (µg/L)	DG-4	147,361	143,189	119,000-142,000	119,000-178,000	154,000	152,000
Total Dissolved Solids (mg/L)	DG-4	698.9	701	543-637	474-672	808	753

Notes:

1) mg/L – milligrams per liter.
2) µg/L – micrograms per liter.
3) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.

4.1 Calcium at DG-4

As summarized in **Table 2**, the original intrawell UPL for calcium at DG-4 was 147,361 micrograms per liter (µg/L) based on the initial eight (8) baseline sampling events that ranged from 119,000 to 142,000 µg/L. In August 2019, the background data set used to calculate statistical limits was expanded to include the first four detection monitoring events. After the addition of four new data points the UPL decreased from 147,361 µg/L to 143,189 µg/L. During the April 2021 detection monitoring event, a concentration of 154,000 µg/L was reported for calcium at DG-4, which was confirmed in June 2021 with a concentration of 152,000 µg/L. These values represent an SSI, but it is important to note the results from these sampling events are close to the UPL, with the April event being approximately 8% higher and the June event approximately 6% higher.

4.2 Total Dissolved Solids at DG-4

As summarized in **Table 2**, the original intrawell UPL for TDS at DG-4 was 689.9 milligrams per liter (mg/L) based on the initial eight (8) baseline sampling events that ranged from 543 to 637 mg/L. In August 2019, the background data set used to calculate statistical limits was expanded to include the first four detection monitoring events. After the addition of four new data points, the UPL increased from 698.9 mg/L to 701 mg/L. During the April 2021 detection monitoring event, a concentration of 808 mg/L was reported for TDS at DG-4, which was confirmed in June 2021 by a verification result of 753 mg/L. These values represent an SSI, though it is important to note that the results from these sampling events are close to the UPL, with the April event approximately 15% higher and the June event approximately 7% higher.

5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs at the SCPC are not the result of a release from the SCPC, but are rather from an alternative source. The following sections provide additional discussion realted to each of the different lines of evidence, which are summarized in bullets below:

- Documentation of pre-existing, low-level concentrations of CCR indicators in groundwater that pre-date the SCPC operation.
- Comparison of key WFGD indicator parameter concentrations (boron, calcium, chloride, fluoride, sodium, and sulfate) prior to and following receipt of CCR in the SCPC.
- Review of historical and current calcium and TDS concentrations at DG-4.
- Documentation of the construction of the SCPC with a composite liner consiting of 80-mil geomembrane liner and a 2-foot thick clay barrier.
- Preparation of geochemical models displaying current and historical background chemistries.

5.1 CCR Indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 3** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 3: Types of CCR and Typical Indicator Parameters

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Fly Ash	Fine grained, powdery material composed mostly of silica made from the burning of finely ground coal in the boiler.	■ Boron ■ Molybdenum ■ Lithium ■ Sulfate ■ Bromide ■ Potassium ■ Sodium ■ Fluoride
Boiler Slag / Bottom Ash	Molten bottom ash from the slag tap and cyclone type furnaces that turns into pellets that have a smooth glassy appearance after quenching with water.	
Flue Gas Desulfurization Material (FGD)	A material leftover from the process of reducing sulfur dioxide emissions from a coal-fired boiler that can be a wet sludge consisting of calcium sulfite or calcium sulfate or a dry powdered material that is a mixture of sulfites and sulfates.	■ Sulfate ■ Fluoride ■ Calcium ■ Boron ■ Bromide ■ Chloride

Notes:

1) Fly Ash and Boiler Slag/Bottom Ash typically have the same indicator parameters.
2) Definitions from USEPA website, available at https://www.epa.gov/coalash/coal-ash-basics.

3) Key indicators from EPRI 2011, 2012, and 2017 as well as Gredell and Reitz & Jens, 2014.

In 2011, the Electric Power Research Institute (EPRI) completed a study of FGD composition from many sites across the country and determined that calcium sulfate dihydrate ($CaSO_4*2H_20$) constitutes greater than 90% of the material that is present in FGD deposits. Therefore, impacts from WFGD deposits will likely contain high concentrations in sulfate and calcium compared to background and adjacent samples. No statistical exceedances are noted for sulfate in SCPC monitoring wells, and the low-level SSI of calcium at DG-4 is less than the UPL for adjacent wells, suggesting an alternative source and not the WFGD, as discussed below. Additionally, fluoride and boron concentrations are also potential indicators of WFGD gypsum (EPRI 2012, EPRI 2017).

5.1.1 Sulfate Concentrations

Sulfate is a key indicator of potential WFGD impacts because high concentrations of sulfate are found ubiquitously in relatively oxidized WFGD materials. Under strongly reducing conditions, sulfate is converted to sulfide. The groundwater around the SCPC does not demonstrate strongly reducing conditions; dissolved oxygen values are above 0.5 mg/L, oxidation reduction potential (ORP) is positive, dissolved iron concentrations are below 1 mg/L, and no hydrogen sulfide odors are reported at the SCPC. Therefore, if the SSIs were a result of impacts from the SCPC, it would be expected that sulfate values would increase following placement of CCR materials or evidence of sulfide in the groundwater would be noted during groundwater sample collection. Neither increasing sulfate values nor evidence of sulfide in the groundwater are indicated for DG-4.

Figure 2 displays the full historical set of sulfate concentrations at DG-4 including the period prior to the receipt of CCR collected for UWL sampling requirements. If the SSIs were caused by influence from the SCPC, sulfate concentrations would be expected to increase following the placement of CCR materials. **Figure 2** demonstrates that current sulfate concentrations are at levels lower than those from pre-CCR placement and, thus, are not indicative of SCPC influence on the groundwater.

5.1.2 Boron Concentrations

Based on the EPRI (2011, 2012, and 2017) reports, elevated concentrations in boron may indicate WFGD impacts. Boron is soluble, mobile, and conservative (i.e., does not interact with geologic materials), and thus a good tracer for CCR related impacts. However, any increased boron concentrations associated with a release from a WFGD type impoundment would be expected to also contain increasing sulfate concentrations, as discussed in the previous section. If groundwater was impacted by the SCPC, current boron concentrations should be statistically elevated with respect to pre-CCR placement.

Figure 3 displays boron concentrations at DG-4 from prior to the receipt of CCR through the current CCR Rule sampling event. Similar to sulfate, **Figure 3** exhibits that current boron concentrations are at lower levels than those from pre-CCR placement and, thus, do not indicate SCPC influence on groundwater quality.

5.2 SSI at DG-4

5.2.1 Calcium Concentrations

Calcium is a key indicator in WFGD impoundments because there are high concentrations of calcium in WFGD (calcium sulfate dihydrate) type impoundments. Like sulfate and boron, if the SSI was caused by impacts from the SCPC, calcium concentrations would be expected to be noticeably higher and at levels statistically higher than pre-CCR placement. **Figure 4** displays calcium concentrations at DG-4 from prior to the receipt of CCR through the current CCR Rule sampling event. This figure demonstrates the current calcium concentration of 154,000 µg/L in monitoring well DG-4 is lower than those reported prior to the operation of the SCPC. In addition, calcium

concentrations have varied between 119,000 µg/L and 178,000 µg/L over the entire historical monitoring period at DG-4. The 12 sampling events used to calculate the UPL were collected between 2016 and 2019. If data collected for the State UWL program prior to the receipt of CCR, where concentrations reached as high as 178,000 µg/L, were used to calculate the prediction limit, the resulting UPL would be 193,980 µg/L, which is well above the April 2021 value of 154,000 µg/L. If the SSI was caused by groundwater influence from the SCPC, calcium concentrations would be expected to be noticeably higher and at levels statistically higher than pre-CCR placement.

Figure 5 displays a box and whisker plot for calcium at wells DG-1 through DG-4 prior to the placement of CCR in the SCPC. A box and whisker plot is a graphical technique that summarizes a set of data and shows the distribution and outliers within a data set. As shown on **Figure 5**, the distribution of the calcium values prior to the placement of CCR is well above 154,000 µg/L at DG-4 and the adjacent wells used to monitor the SCPC (DG-1, DG-2, and DG-3). This data further demonstrates that the calcium values detected during the April 2021 and June 2021 sampling events are within typical background levels for this area, supporting the argument that the SSI at DG-4 was not caused by the SCPC, but rather, is caused by the natural geochemical variability within the aquifer and/or field sampling/laboratory induced variability.

Based on historical and recent data, in addition to the observations reported above for sulfate and boron, it is Golder's opinion that the variability in calcium concentrations over time in well DG-4 is not a result of WFGD influence on the groundwater, but is likely a result of natural geochemical variability, field sampling/laboratory induced variability in groundwater concentrations, and the limited sample set used for UPL calculation that does not reflect the whole variability of the aquifer.

5.2.2 TDS Concentrations

TDS by itself is not known to be an indicator of fly ash, boiler slag/bottom ash, or WFGD wastes (EPRI 2017, EPRI 2012). The concentration of TDS is largely based on the concentration of major ions in groundwater (calcium, magnesium, sodium, potassium, carbonates, chloride, sulfate, etc.). Although TDS alone is not a key indicator of CCR impacts, an increase in some of the major ions associated with CCR (alkalinity, calcium, chloride, potassium, sodium, and sulfate) can result from CCR impacts.

Shown in **Table 1**, concentrations for the April 2021 and subsequent verification sampling event are 808 and 753 mg/L, respectively, slightly higher (within 15%) than the calculated UPL of 701 mg/L. The UPL calculated at DG-4 is from 12 sampling events from May 2016 through August 2019, where TDS concentrations at DG-4 ranged from 528 mg/L to 671 mg/L. Prior to the placement of CCR in the SCPC, TDS ranged from 450 to 896 mg/L in the monitoring wells used to monitor the SCPC (UG-1A, UG-2, DG-1, DG-2, DG-3, and DG-4). If a UPL is calculated from pooling the original 9 (nine) sampling events with data collected prior to waste placement, the resulting calculated limit is 896 mg/L using a non-parametric test (because the dataset is not normally distributed (**Figure 6**)). While the current TDS values at DG-4 are higher than those displayed historically, the current TDS values are not elevated when compared to adjacent monitoring wells prior to the placement of CCR materials in the SCPC, supporting the argument that the SSI at DG-4 was not caused by the SCPC, but rather, is caused by natural geochemical variability within the aquifer and/or field sampling/laboratory induced variability.

Based on historical and recent data, in addition to the observations reported above for sulfate and boron, it is Golder's opinion that the variability in TDS concentrations over time is not a result of WFGD influence on the groundwater, but is likely a result of natural geochemical variability, field sampling/laboratory induced variability in groundwater concentrations, and/or the limited sample set that was originally used for UPL calculation which does not reflect the whole variability of TDS in the alluvial aquifer.

6.0 DEMONSTRATION THAT SSIs WERE NOT CAUSED BY SCPC IMPACT

Based on the information presented in Section 5 above, the SSIs for calcium and TDS at DG-4 are not caused by the SCPC. The SSIs appear to be caused by numerous factors, but are primarily caused by the following:

- Natural spatial and temporal variability in the alluvial aquifer sampling results that are influenced by pre-existing low-level CCR impacts.
- Relatively low calculated UPLs that do not reflect the full variability within the alluvial aquifer when compared to historical data for DG-4.

As required by the CCR Rule, eight (8) baseline samples were collected prior to the October 2017 deadline which were used to calculate the UPL at each compliance well around the SCPC. According to the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA 2009), eight (8) samples is the minimum number of samples recommended in order to complete statistical tests and future data will be used to enlarge the dataset for UPL calculation. In August 2019, the baseline data set used to calculate the UPLs was expanded; however, the background dataset of twelve (12) measurements is still relatively small compared to the amount of data that has been collected from well DG-4 as part of the State UWL monitoring program. At the SCPC, previous data from State UWL monitoring program put the SSIs in context relative to historical groundwater conditions at the site. The next round of background updates is schedule to be completed before the statistical analysis of the November 2021 sampling event.

As shown in Section 5, calcium and TDS results are within historical values collected prior to the receipt of CCR materials at the SCPC. The dataset used to calculate the current UPLs were collected in a relatively short timeframe in accordance with the CCR Rule and had statistically lower results than typically found during historic UWL sampling at these wells. Therefore, the UPL calculated from these data only represents the lower range of values in the overall population and does not capture the full natural variability.

The comparison of key WFGD indicator parameters (sulfate and calcium), as well as other potential indicators (fluoride, boron, chloride, and sodium) between current groundwater conditions and those present prior to SCPC operations, support the conclusion that the SCPC is not the source of the SSIs. If impacts were caused by the SCPC, an increase in these parameters (particularly sulfate, calcium, and boron) would be expected, but this is not occurring. Further, the construction of the SCPC, with 2-feet of compacted clay overlain by an 80-mil HDPE liner, also limits the likelihood that the SSIs are a result an impact from the SCPC.

In summary, there are no indications to support migration of CCR contaminants from the SCPC. Instead, the data indicate that the cause for the SSIs is due to alluvial aquifer variability, pre-existing CCR impacts, and a limited dataset available for the calculation of the UPL.

7.0 REFERENCES

Ameren Missouri. 2016. Structural Integrity Criteria & Hydrologic/Hydraulic Capacity Assessment, Sioux Energy Center.

Electric Power Research Institute (EPRI). 1998, Field Evaluation of the Comanagement of Utility Low-Volume Wastes With High-Volume Coal Combustion By-Products: SX Site. Report TRACE-108409. September 1998.

Electric Power Research Institute (EPRI). 2011, Composition and Leaching of FGD Gypsum and Mined Gypsum, Report 1022146. November 2011.

Electric Power Research Institute (EPRI). 2012, Groundwater Quality Signatures for Assessing Potential Impacts from Coal Combustion Product Leachate, Report 1017923. October 2012.

Electric Power Research Institute (EPRI). 2017, Guidelines for Development of Alternative Source Demonstrations at Coal Combustion Residual Sites, Report 3002010920, October 2017.

Golder Associates Inc., 2017, 40 CFR Part 257 Groundwater Monitoring Plan, SCPC – Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2018, 2017 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2019a, 2018 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2019b, Updated Statistical Limits With Additional Background Data – SCPC.

Golder Associates Inc., 2020, 2019 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

Golder Associates Inc., 2021, 2020 Annual Groundwater Monitoring Report, SCPC – Utility Waste Landfill Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

GREDELL Engineering Resources, Inc. 2006. Detailed Geologic and Hydrologic Site Investigation Report. AmerenUE Sioux Power Plant Proposed Utility Waste Disposal Area. St. Charles County, Missouri. Aug 2006.

GREDELL Engineering Resources, Inc. 2009. Background Groundwater Monitoring Report. AmerenUE Sioux Power Plant. St. Charles County, Missouri. June 2009.

Johnson, A.I. 1967. Specific Yield – Compilation of Specific Yields for Various Materials: U.S. Geological Survey Water-Supply Paper 1662-D. Available at: https://pubs.er.usgs.gov/publication/wsp1662D.

MDNR. 2011. Missouri Well Construction Rules. Missouri Department of Natural Resources Division of Geology and Land Survey. Rolla, MO. August 2011.

Reitz & Jens, Inc., and GREDELL Engineering Resources, Inc. 2014. Ameren Missouri Sioux Power Plant – Utility Waste Landfill – Proposed Construction Permit Modification – Construction Permit Number 0918301 – St. Charles County, Missouri, revised August 2014.

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Resource Conservation and Recovery – Program Implementation and Information Division. March.

USEPA. 2015. Federal Register. Volume 80. No. 74. Friday April 17, 2015. Part II. Environmental Protection Agency. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule/ [EPA-HQ-RCRA-2009-0640; FRL-9919-44-OSWER].

Tables

Table 1
April 2021 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
April 2021 Detection Monitoring Event															
DATE	NA	4/13/2021	4/13/2021	NA	4/14/2021	NA	4/13/2021	NA	4/14/2021	NA	4/14/2021	NA	4/14/2021	NA	4/14/2021
pH	SU	6.85	6.98	6.436-7.44	6.84	6.63-7.528	7.09	6.714-7.386	6.95	6.773-7.387	6.96	6.355-7.543	6.90	6.527-7.384	6.84
BORON, TOTAL	µg/L	70.8 J	74.2J	327	146	208.9	120	130.1	103	127.6	98.5 J	126	92.6 J	119.5	87.5 J
CALCIUM, TOTAL	µg/L	149,000	134,000	177,869	146,000	129,922	80,500	142,166	135,000	139,133	135,000	156,515	143,000	143,189	154,000
CHLORIDE, TOTAL	mg/L	8.2	12.8	145.9	90.1	108.8	2.3	11.18	8.6	9.596	7.5	16.74	5.9	119.9	95.3
FLUORIDE, TOTAL	mg/L	0.36	0.39	0.3643	0.33	0.3308	0.28 J	0.3797	0.30	0.4315	0.38	0.4424	0.36	0.37	0.34 J
SULFATE, TOTAL	mg/L	29.4	34.8	107.8	55.4	83.09	70.6	60.32	52.0	45.51	35.4	59.31	60.9	62.54	51.1
TOTAL DISSOLVED SOLIDS	mg/L	579	509	833.4	719	626	373	555.4	533	524.9	522	624.7	535	701	808
June 2021 Verification Sampling Event															
DATE	NA												6/2/2021		6/2/2021
pH	SU														
BORON, TOTAL	µg/L														
CALCIUM, TOTAL	µg/L														152,000
CHLORIDE, TOTAL	mg/L														
FLUORIDE, TOTAL	mg/L														
SULFATE, TOTAL	mg/L												52.6		
TOTAL DISSOLVED SOLIDS	mg/L														753

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: EMS
Checked By: LMS
Reviewed By: SCP

Table 4
Major Cation and Anion Concentrations
SCPC - Alternative Source Demonstration
Sioux Energy Center, St. Charles County, MO

Monitoring Well ID	Total Sodium (mg/L)	Total Potassium (mg/L)	Total Calcium (mg/L)	Total Magnesium (mg/L)	Total Chloride (mg/L)	Total Sulfate (mg/L)	Total Alkalinity [(2)] (mg/L)
Detection Monitoring - April 2021							
S-BMW-1S	4.75	0.397	149	28.5	8.2	29.4	450
S-BMW-3S	5.47	0.520	134	23.8	12.8	34.8	399
S-DG-1	4.82	5.77	135	29.6	8.6	52.0	417
S-DG-2	5.06	6.04	135	28.8	7.5	35.4	413
S-DG-3	4.47	5.03	143	29.1	5.9	60.9	405
S-DG-4	20.8	7.06	154	46.6	95.3	51.1	426
S-UG-1A	32.6	7.90	146	34.5	90.1	55.4	403
S-UG-2	5.4	3.31	80.5	17.8	2.3	70.6	257
Historical Data - June 2006							
PZ-2	3.8	2.8	120	32	36	6.6	420
PZ-3	5.4	5.2	140	27	12	53	440
PZ-10	3.4	3.9	99	31	4.6	43	370
PZ-25	4.2	4.9	120	38	19	29	470

Notes:

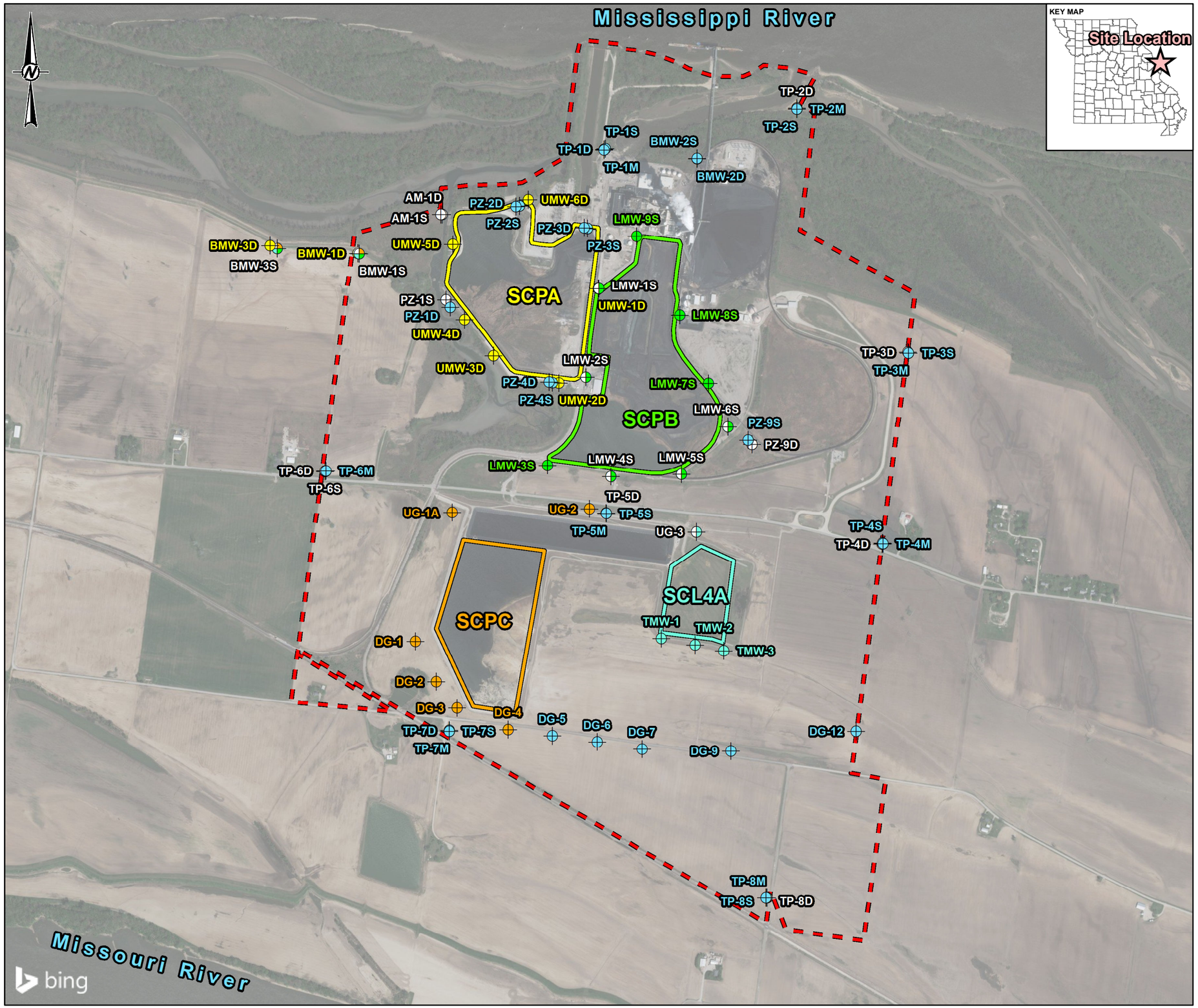
1) 2006 Historical Data from Appendix 13 of the Detailed Site Investigation (DSI).

2) Alkalinity is equal to Carbonate + Bicarbonate.

3) mg/L - milligrams per liter.

Prepared By: BTT
Checked By: GTM
Reviewed By: SCP

Figures



NOTE(S)
1.) ALL BOUNDARIES AND LOCATIONS ARE APPROXIMATE.
2.) WFGD - WET FLUE GAS DESULFURIZATION
3.) CCR - COAL COMBUSTION RESIDUAL

REFERENCE(S)
1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND MONITORING WELL LOCATION MAP

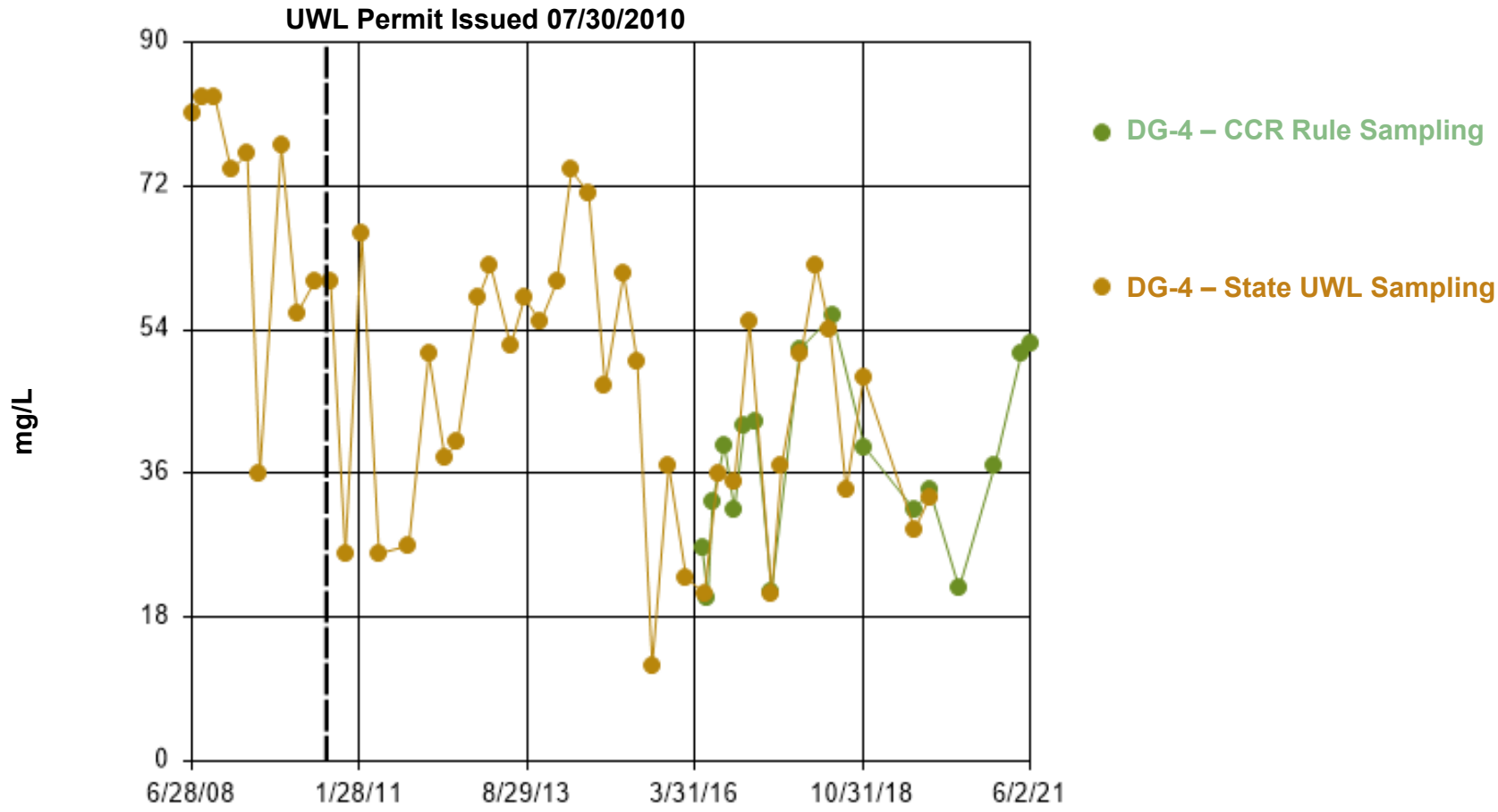
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-18
DESIGNED	JSI
PREPARED	ETF
REVIEWED	BTT
APPROVED	SCP

PROJECT NO.	CONTROL	REV.	FIGURE
1531406-03	1240	0	1

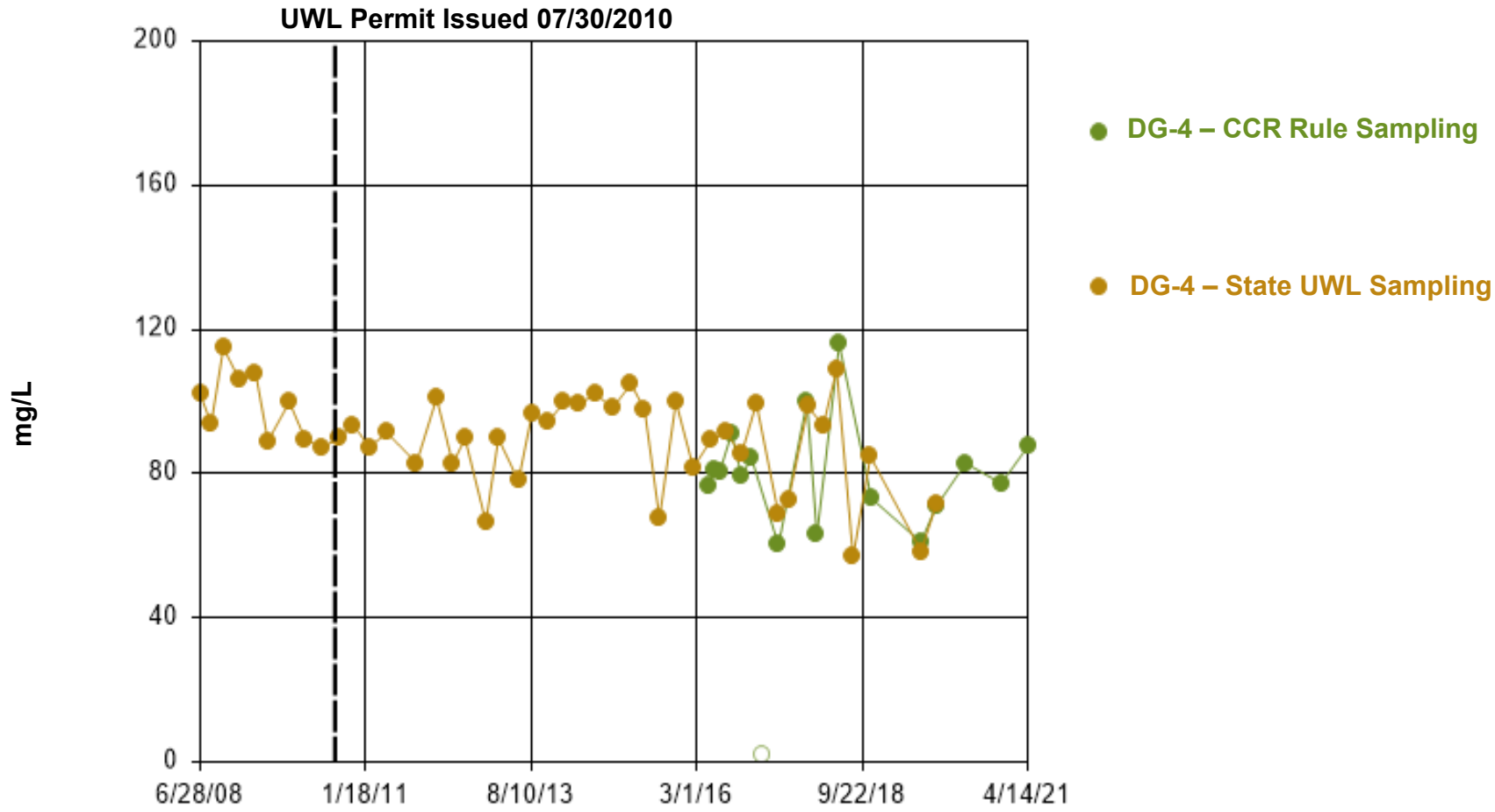
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: C:\Users\EVFormey\Golder Associates\1531406\01.02 - Ameren CCR GW Monitoring Program 2020 - 5 Technical Work\0003-SEC\3-5-Figures-Drawings\PRODUCTION\Other Maps\Figure 3 - CCR WELL PROGRAMS - Copy.mxd PRINTED ON: 2021-10-19 AT: 3:39:20 PM



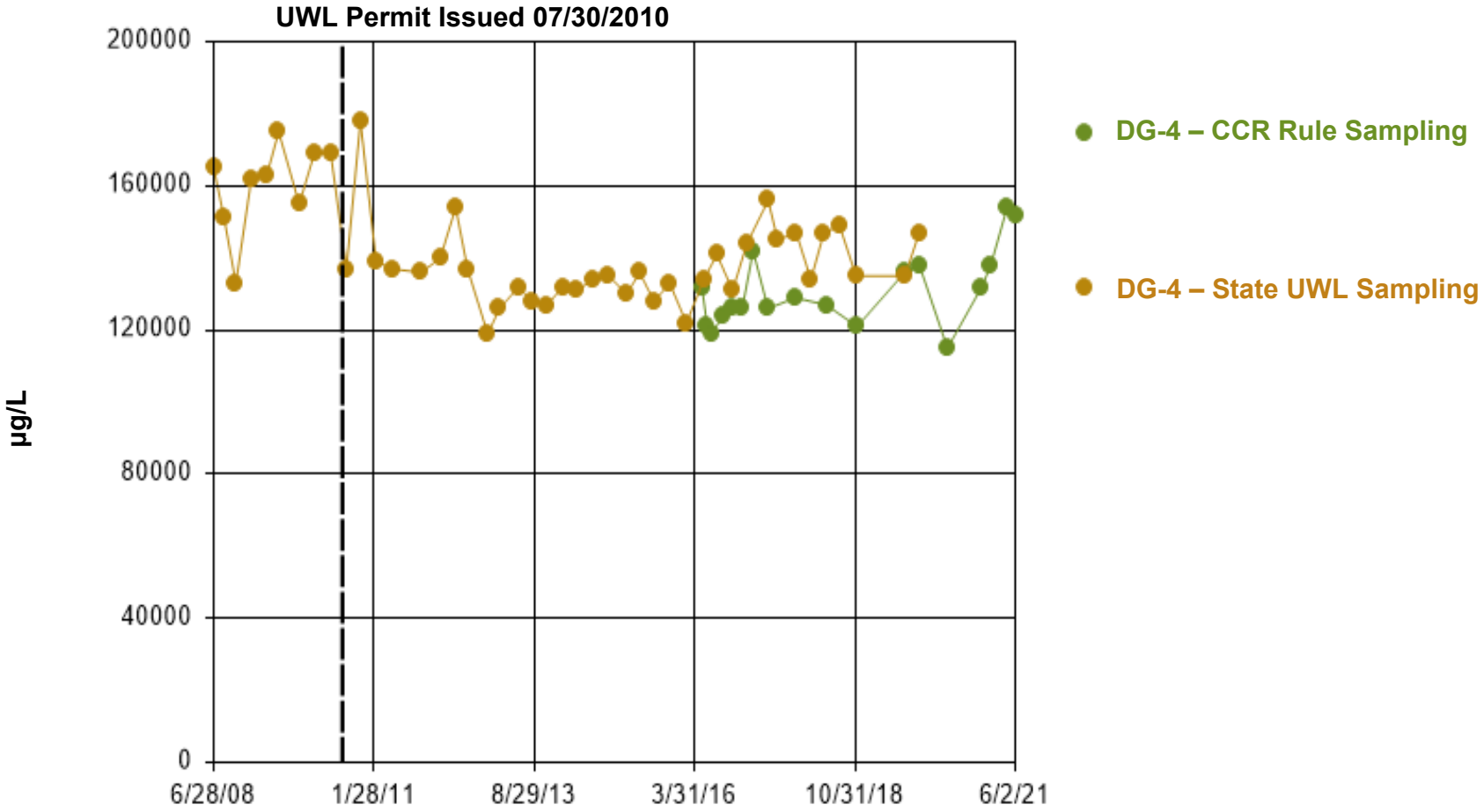
Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT								TITLE	
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER MEMBER OF WSP				**Sulfate Time Series Plot at DG-4**	
DRAWN BTT	CHECKED GTM	REVIEWED SCP	DATE 2021-10-14	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **2**



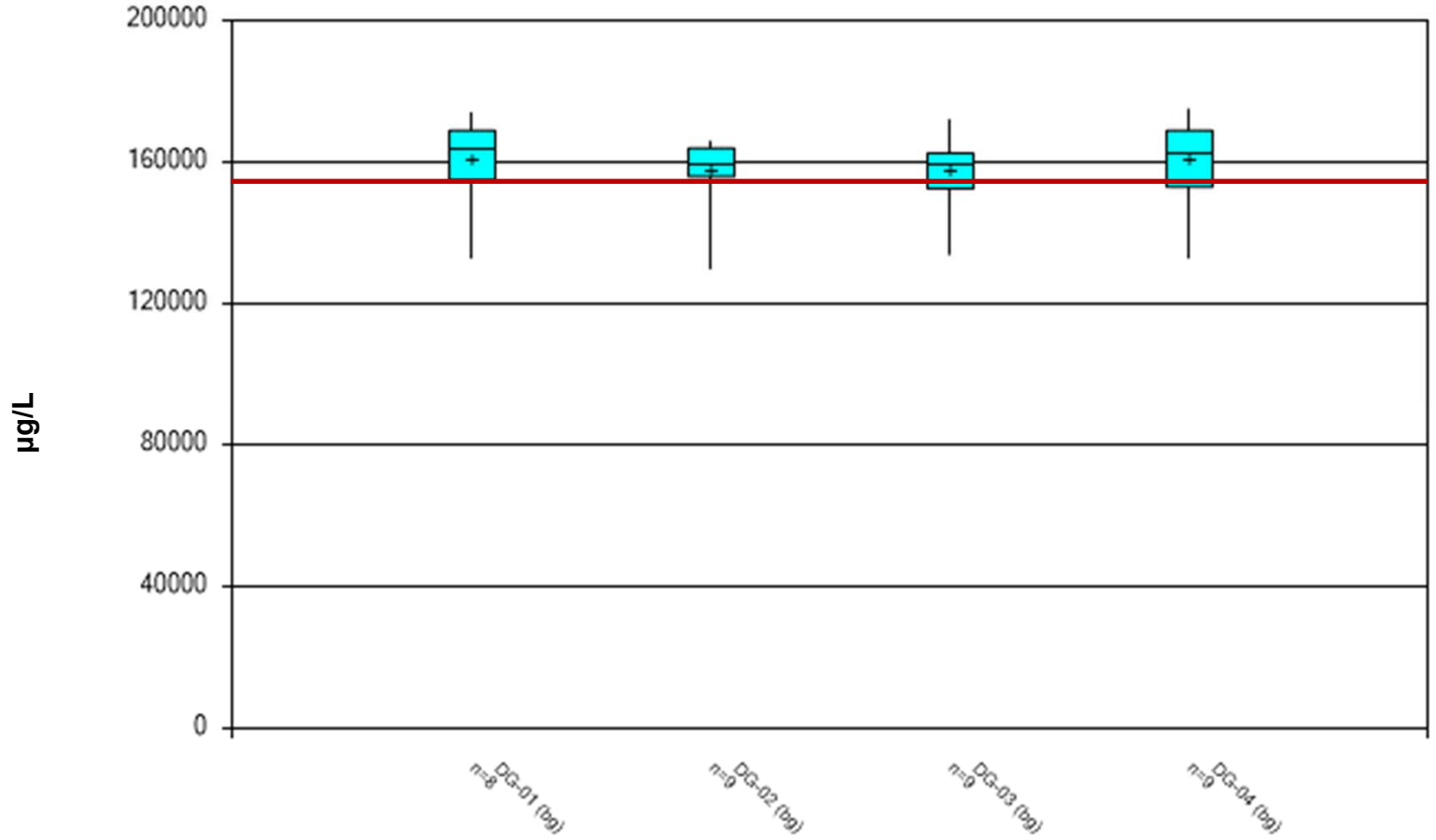
Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT							TITLE			
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER MEMBER OF WSP			**Boron Time Series Plot at DG-4**			
DRAWN BTT	CHECKED GTM	REVIEWED SCP	DATE 2021-10-14	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **3**



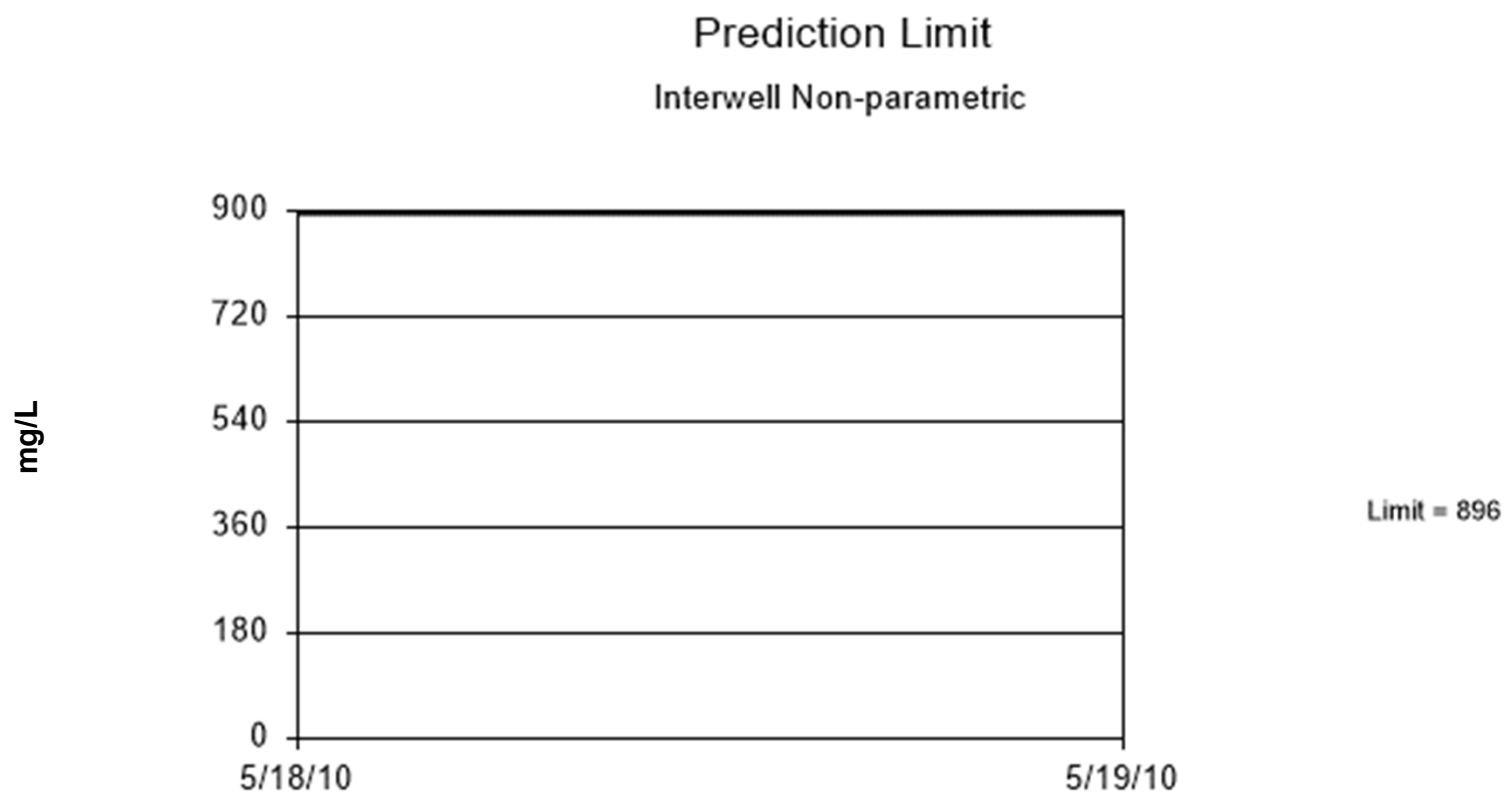
Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.

CLIENT/PROJECT								TITLE	
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER MEMBER OF WSP				**Calcium Time Series Plot at DG-4**	
DRAWN BTT	CHECKED GTM	REVIEWED SCP	DATE 2021-10-14	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **4**



Notes
1) µg/L – Micrograms per liter.
2) Box and whisker plot generated using Sanitas software.
3) Data from before UWL Permit issued on 7/30/2010.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				GOLDER MEMBER OF WSP			**Box and Whisker Plot – Calcium – Pre CCR-Placement**		
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
BTT	GTM	SCP	2021-10-14	N/A	N/A	153140603.0003	N/A	N/A	N/A	**5**



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 53 background values. Annual per-constituent alpha = 0.008067. Individual comparison alpha = 0.0006747 (1 of 2). Assumes 6 future values.

Notes
1) UPL – Upper Prediction Limit
2) Pre-CCR Placement before UWL permit was issued on 7/30/2010.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				GOLDER MEMBER OF WSP			**SCPC UPL for TDS – Pre-CCR Placement**		
DRAWN BTT	CHECKED JSI	REVIEWED SCP	DATE 2021-10-14	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0003	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **6**

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APPENDIX D

2021 Potentiometric Surface Maps

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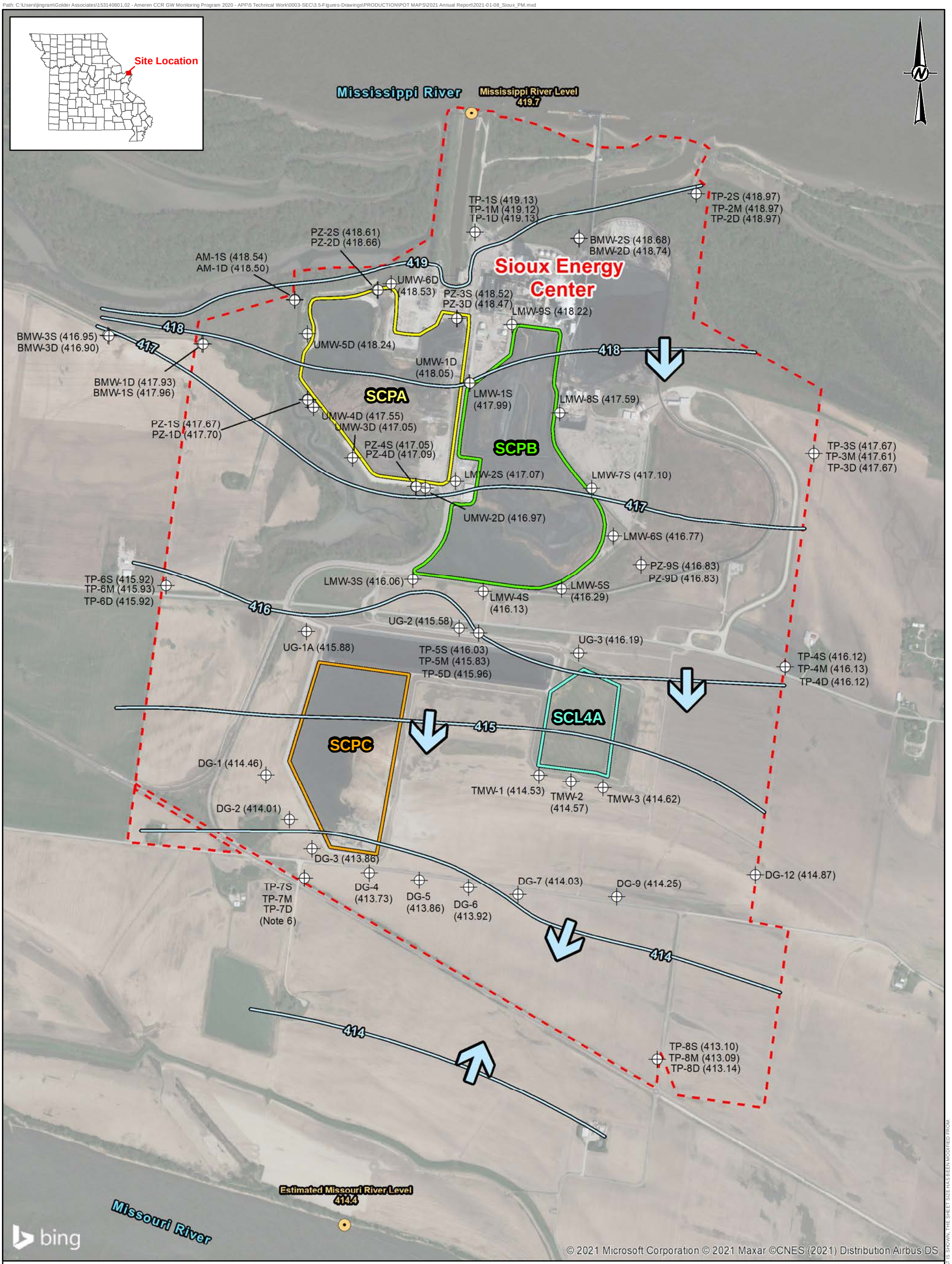

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment
- SCPB - Fly Ash Surface Impoundment
- SCPC - WFGD Surface Impoundmet
- SCL4A - Dry CCR Disposal Area
- Groundwater Flow Direction

Groundwater Elevation Contour (FT MSL)

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- River Gauge Location
- Monitoring Well or Piezometer

NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) TP-7S, TP-7M, AND TP-7D WERE NOT USED IN POTENTIOMETRIC CONTOURING DUE TO MEASUREMENT ERROR.
7.) WFGD - WET FLUE GAS DESULURIZATION.

REFERENCE

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
JANUARY 8, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-01-28
PREPARED	BTT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No. 153-140603
PHASE 0003
FIGURE **D1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

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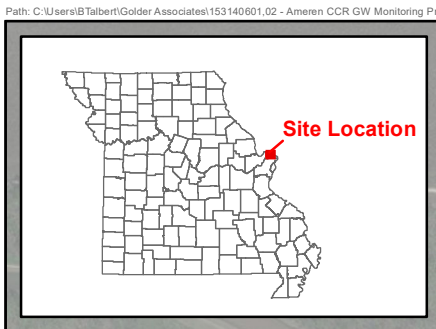

Mississippi River
Mississippi River Level
417.0
417
TP-2S (416.97)
TP-2M (416.96)
TP-2D (416.96)
TP-1S (417.17)
TP-1M (417.21)
TP-1D (417.20)
BMW-2S (417.13)
BMW-2D (417.15)
PZ-2S (417.64)
PZ-2D (417.66)
AM-1S (417.62)
AM-1D (417.65)
Sioux Energy Center
UMW-6D (417.47)
PZ-3D (417.73)
LMW-9S (417.60)
UMW-5D (417.79)
PZ-3S (417.79)
418
BMW-3D (418.30)
BMW-3S (418.29)
BMW-1S (418.11)
BMW-1D (Note 6)
UMW-1D (417.99)
SCPA
LMW-1S (418.07)
UMW-4D (418.16)
LMW-8S (417.95)
PZ-1S (418.24)
PZ-1D (418.23)
UMW-3D (418.35)
SCPB
TP-3S (417.63)
TP-3M (417.70)
TP-3D (417.66)
LMW-2S (418.31)
LMW-7S
(418.14)
PZ-4S (418.55)
PZ-4D (418.54)
UMW-2D (418.39)
LMW-6S (418.03)
419
PZ-9S (418.44)
PZ-9D (418.45)
LMW-3S
(418.71)
LMW-4S (418.60)
LMW-5S
(418.46)
TP-6S (419.07)
TP-6M (419.06)
TP-6D (419.04)
UG-2 (418.49)
UG-1A (419.32)
TP-5S (418.45)
TP-5M (418.35)
TP-5D (418.43)
UG-3 (418.93)
418
TP-4S (417.19)
TP-4M (417.21)
TP-4D (417.22)
SCL4A
SCPC
TMW-1
(418.87)
DG-1 (419.65)
TMW-2
(418.83)
TMW-3 (418.77)
DG-2 (419.69)
419
DG-3
(419.68)
DG-4 (419.58)
DG-6 (419.46)
DG-12 (418.95)
TP-7S (419.39)
TP-7M (419.37)
TP-7D (419.39)
DG-5 (419.52)
DG-9 (419.13)
DG-7 (419.41)
TP-8S (418.90)
TP-8M (418.91)
TP-8D (418.87)
Estimated Missouri River Level
418.8
Missouri River
bing
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LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment
- SCPB - Fly Ash Surface Impoundment
- SCPC - WFGD Surface Impoundmet
- SCL4A - Dry CCR Disposal Area
- Groundwater Flow Direction

Groundwater Elevation Contour (FT MSL)

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- River Gauge Location
- Monitoring Well or Piezometer

NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) BMW-1D IS NOT USED FOR POTENTIOMETRIC CONTOURING DUE TO MEASUREMENT ERROR.
7.) WFGD - WET FLU GAS DESULURIZATION.

REFERENCE

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
APRIL 8, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-05-10
PREPARED	BTT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No. 153-140603
PHASE 0003
FIGURE **D2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

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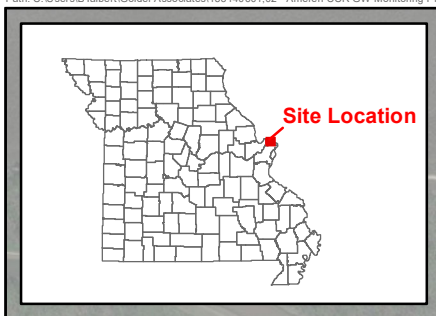

Mississippi River
Mississippi River Level
417.4
TP-1S (417.41)
TP-1M (417.43)
TP-1D (417.43)
TP-2S (417.21)
TP-2M (417.21)
TP-2D (417.21)
BMW-2S (417.37)
BMW-2D (417.42)
PZ-2S (417.8)
PZ-2D (417.84)
AM-1S (417.76)
AM-1D (417.76)
UMW-6D (417.68)
Sioux Energy Center
PZ-3S (418.04)
PZ-3D (418.00)
LMW-9S (417.89)
UMW-5D (417.91)
BMW-3S (418.38)
BMW-3D (418.41)
BMW-1S (418.20)
BMW-1D (418.18)
SCPA
LMW-1S (418.36)
UMW-1D (418.37)
UMW-4D (418.31)
LMW-8S (418.23)
PZ-1S (418.39)
PZ-1D (418.37)
UMW-3D (418.55)
418
TP-3S (417.98)
TP-3M (418.02)
TP-3D (418.03)
SCPB
LMW-7S (418.41)
LMW-2S (418.58)
PZ-4S (418.72)
PZ-4D (418.77)
UMW-2D (418.63)
LMW-6S (418.51)
TP-6S (419.42)
TP-6M (419.44)
TP-6D (419.44)
LMW-3S (418.89)
PZ-9S (418.75)
PZ-9D (418.78)
LMW-4S (418.82)
LMW-5S (418.75)
UG-1A (419.52)
UG-2 (418.72)
UG-3 (419.24)
TP-4S (418.39)
TP-4M (418.58)
TP-4D (418.61)
TP-5S (418.97)
TP-5M (418.98)
TP-5D (418.98)
419
SCPC
SCL4A
DG-1 (419.98)
TMW-1 (419.19)
TMW-2 (419.14)
TMW-3 (419.14)
DG-2 (419.99)
DG-3 (420.03)
DG-4 (419.97)
DG-12 (419.33)
TP-7S (419.76)
TP-7M (419.79)
TP-7D (419.79)
DG-5 (419.91)
DG-6 (419.83)
DG-9 (419.53)
DG-7 (419.77)
420
TP-8S (419.30)
TP-8M (419.35)
TP-8D (419.36)
Estimated Missouri River Level
420.6
Missouri River
bing
© 2022 Microsoft Corporation © 2022 Maxar ©CNES (2022) Distribution Airbus DS

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment
- SCPB - Fly Ash Surface Impoundment
- SCPC - WFGD Surface Impoundmet
- SCL4A - Dry CCR Disposal Area
- Groundwater Flow Direction

Groundwater Elevation Contour (FT MSL)

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- River Gauge Location
- Monitoring Well or Piezometer

NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) WFGD - WET FLUE GAS DESULURIZATION.

REFERENCE

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
JUNE 1, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-11
PREPARED	ETF
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No. 153-140603
PHASE 0003
FIGURE **D3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

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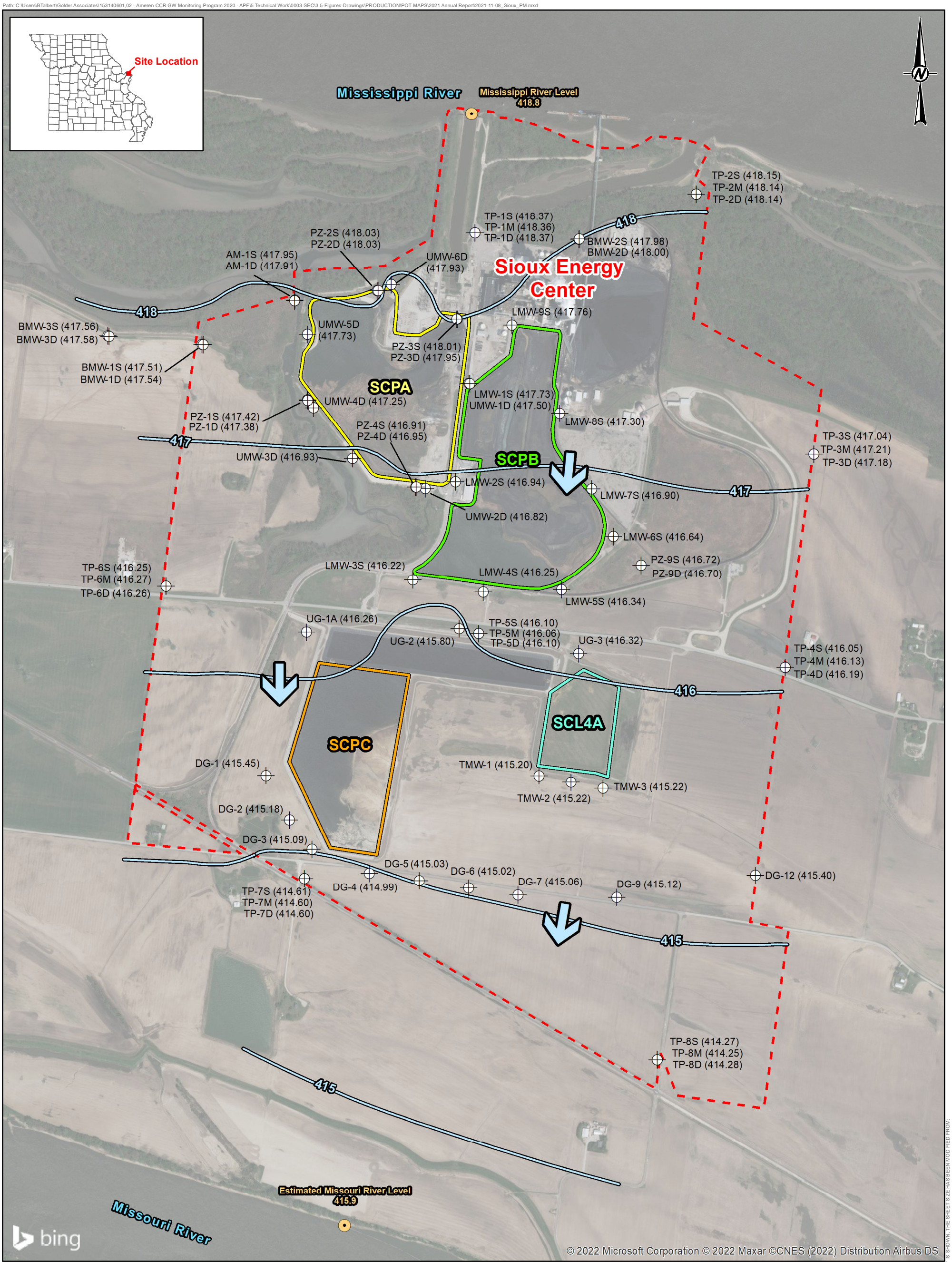

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment
- SCPB - Fly Ash Surface Impoundment
- SCPC - WFGD Surface Impoundmet
- SCL4A - Dry CCR Disposal Area
- Groundwater Flow Direction

Groundwater Elevation Contour (FT MSL)

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- River Gauge Location
- Monitoring Well or Piezometer

NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) WFGD - WET FLUE GAS DESULURIZATION.

REFERENCE

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
NOVEMBER 8, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-12-02
PREPARED	ETF
DESIGN	JSI
REVIEW	BTT
APPROVED	MNH

PROJECT No. 153-140603
PHASE 0003
FIGURE **D4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

golder.com