REPORT

2023 Annual Groundwater Monitoring and Corrective Action Report

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

January 31, 2024

Project Number: 23009

Submitted to:

Ameren Missouri
1901 Chouteau Avenue
St. Louis, Missouri 63103

Submitted by:

Rocksmith Geoengineering, LLC
2320 Creve Coeur Mill Rd
Maryland Heights, MO 63043

EXECUTIVE SUMMARY AND STATUS OF THE SCPD 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 SCPD Coal Combustion Residuals (CCR) Surface Impoundment at the Sioux Energy Center (SEC) is subject to the requirements of the CCR Rule. This Annual Report for the SCPD describes CCR Rule groundwater monitoring activities from January 1, 2023 through December 31, 2023.

The SCPD began receiving CCR waste on December 14, 2022. Throughout 2023, the SCPD CCR unit has been operating under the Detection Monitoring Program (§257.94), with the first Detection Monitoring sampling event beginning on May 2, 2023. 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. One SSI was determined during the May 2023 sampling event and a summary of the SSIs for the past year is provided in **Table 1**.

Table 1 - Summary of 2023 SCPD Sampling Events, Previous Year Verification, and Statistical Evaluations

Event Name	Type of Event and Sampling Dates	Laboratory Analytical Data Receipt	Parameters Collected	Verified SSIs	SSI Determination Date	ASD Completion Date
May 2023 Sampling Event	Detection Monitoring, May 2-4, 2023	June 21, 2023	Appendix III, Major Cations and Anions	**Boron:** UG-2	September 19, 2023	December 18, 2023
	Verification Sampling, July 11, 2023	July 25, 2023	Detected Appendix III parameters			
November 2023 Sampling Event	Detection Monitoring, November 10-13, 2023	December 27, 2023	Appendix III, Major Cations and Anions	To be determined after statistical analysis and Verification Sampling are completed in 2024.		

Notes:
1) Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
2) NA – Not Applicable.
3) SSI – Statistically Significant Increase.
4) ASD – Alternative Source Demonstration.

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 Alternative Source Demonstration (ASD) was prepared for the May 2023 sampling event and is discussed further in this Annual Report.

There were no changes made to the monitoring system in 2023 with no new wells being installed or decommissioned.

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1.0 INSTALLATION OR DECOMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the SCPD. The groundwater monitoring system consists of six groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1** and is listed on **Table 2**, below. No new monitoring wells were installed or decommissioned in 2023 as a part of the CCR Rule monitoring program for the SCPD. For more information on the groundwater monitoring network, details are provided in the 2022 Annual Groundwater Monitoring Report for the SCPD.

2.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the SCPD CCR Unit in 2023. **Table 2** below provides a summary of the groundwater samples collected in 2023 including the number of samples, the date of sample collection, and the monitoring program for which the samples were collected.

Table 2 – Summary of Groundwater Sampling Dates

Sampling Event	Groundwater Monitoring Wells						Monitoring Program
	BMW-1S	BMW-3S	UG-2	TMW-4	TMW-5	TMW-6	
	Date of Sample Collection						
May 2023 Sampling Event	5/2/2023	5/2/2023	5/3/2023	5/4/2023	5/4/2023	5/4/2023	Detection
July 2023 Verification Sampling	-	-	7/11/2023	-	-	-	Detection
November 2023 Sampling Event	11/10/2023	11/10/2023	11/13/2023	11/13/2023	11/13/2023	11/13/2023	Detection
Total Number of Samples Collected	2	2	3	2	2	2	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.

2.1 Detection Monitoring Program

The first Detection Monitoring sampling event for the SCPD was completed May 2-4, 2023, and testing was completed for all Appendix III analytes, as well as major cations and anions. One boron detection above its prediction limit at UG-2 triggered a verification sampling event, which was completed on July 11, 2023 and verified the SSI. **Table 3** summarizes the results and statistical analyses of the May 2023 Detection Monitoring event. Laboratory analytical data from these sampling events 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 this SSI and is provided in **Appendix B**. This ASD demonstrates that the SSI at monitoring well UG-2 is not caused by the SCPD CCR Unit, and therefore, the SCPD CCR Unit remains in Detection Monitoring.

A Detection Monitoring sampling event was completed November 10-13, 2023, and testing was completed for all Appendix III analytes, as well as major cations and anions. Statistical analyses to evaluate for SSIs in the November 2023 data were not completed in 2023 and the results will be provided in the 2024 Annual Report. **Table 5** summarizes the results of the November 2023 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

2.2 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 C**. 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, which affect water levels, gradients and flow directions in 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 at the SEC were estimated for the alluvial aquifer wells using commercially available software to evaluate data since 2016. Results indicate that groundwater flow direction at the SEC is variable due to fluctuating river levels but has most often flowed from north to south. The overall net groundwater flow direction in the alluvial aquifer at the SEC was south-southeast in 2023 as a result of river levels in the Missouri and Mississippi Rivers. From 2016 through 2022, horizontal gradients have ranged from 0.00006 to 0.001 feet/foot with an estimated net annual groundwater movement of approximately four feet per year in the prevailing downgradient direction. Since July 2022, due to low Missouri River levels, there has been a more prevalent southward flow direction at a rate of approximately 35 feet per year.

2.3 Sampling Issues

No notable sampling issues were encountered at the SCPD in 2023.

3.0 ACTIVITIES PLANNED FOR 2024

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2024. Statistical analysis of the November 2023 Detection Monitoring data will be completed in 2024 and will be included in the 2024 Annual Report.

Tables

Table 3
May 2023 Detection Monitoring Results
SCPD - Landfill Cell 2
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-2	UG-2	Prediction Limit TMW-4	TMW-4	Prediction Limit TMW-5	TMW-5	Prediction Limit TMW-6	TMW-6
May 2023 Detection Monitoring Event											
DATE	NA	5/2/2023	5/2/2023	NA	5/3/2023	NA	5/4/2023	NA	5/4/2023	NA	5/4/2023
pH	SU	6.80	6.95	6.29-7.36	7.09	6.585-7.26	7.00	6.642-7.223	6.93	6.59-7.093	6.93
BORON, TOTAL	µg/L	64.8 J	67.1 J	264.7	458	122.2	99.5 J	116.0	95.7 J	131.8	120
CALCIUM, TOTAL	µg/L	184,000	137,000	146,120	115,000	146,033	130,000	156,060	140,000	179,541	141,000
CHLORIDE, TOTAL	mg/L	13.1	12.6	98.49	37.2	3.216	3.1	2.435	1.9	11.02	2.7
FLUORIDE, TOTAL	mg/L	ND	ND	0.3257	ND	0.48	ND	0.6744	ND	0.37	ND
SULFATE, TOTAL	mg/L	37.7	32.4	95.94	51.8	44.43	38.3	46.12	39.7	51.85	30.7
TOTAL DISSOLVED SOLIDS	mg/L	610	495	758	496	571	331 J	600.6	526	719.8	566 J
July 2023 Verification Sampling Event											
DATE	NA				7/11/2023						
pH	SU										
BORON, TOTAL	µg/L				291						
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L										
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L										
TOTAL DISSOLVED SOLIDS	mg/L										

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. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
7. 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: GTM
Checked By: JSI
Reviewed By: MNH

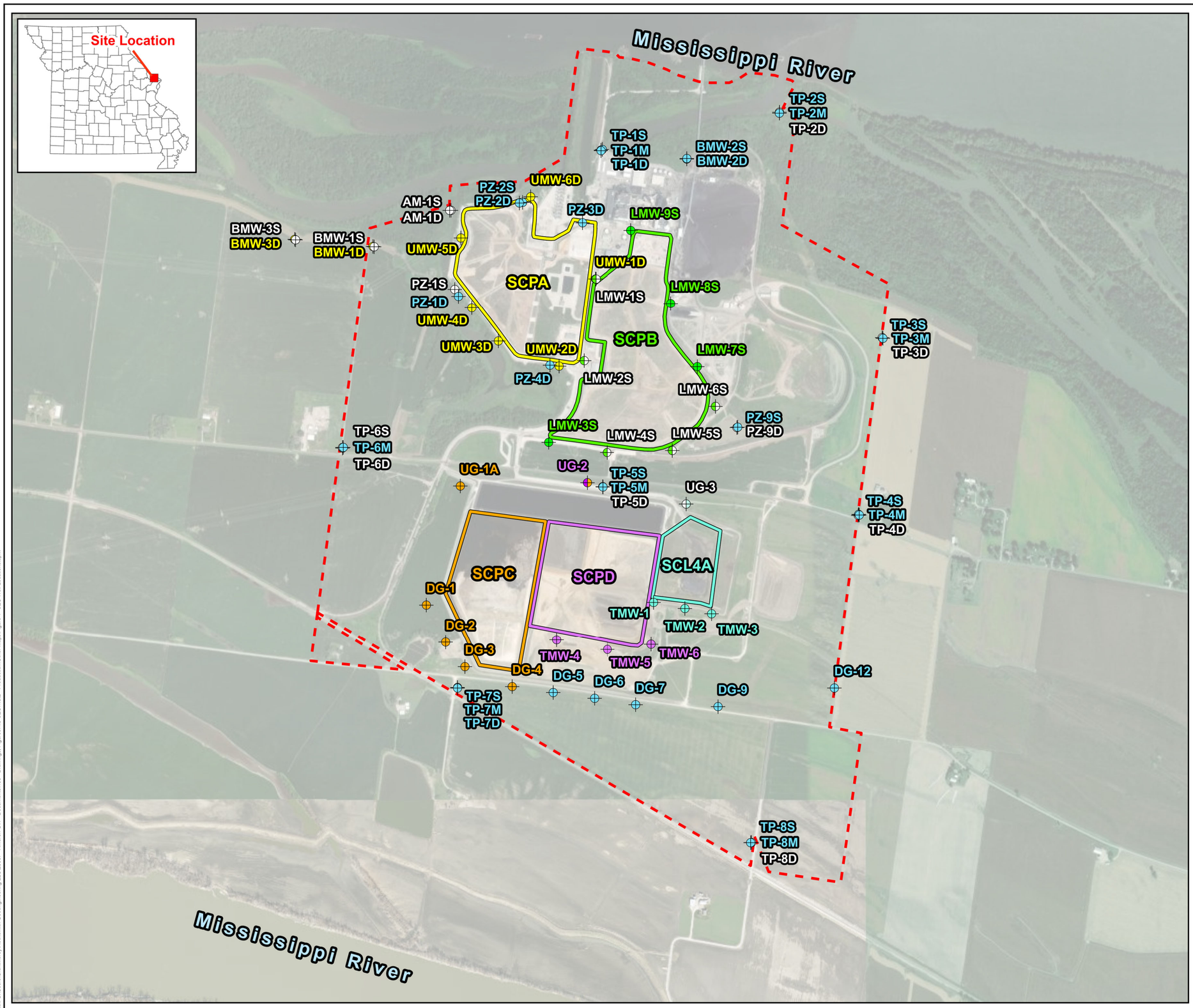
Table 4
November 2023 Detection Monitoring Results
SCPD - Landfill Cell 2
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS			
ANALYTE	UNITS	BMW-1S	BMW-3S	UG-2	TMW-4	TMW-5	TMW-6
November 2023 Detection Monitoring Event							
DATE	NA	11/10/2023	11/10/2023	11/13/2023	11/13/2023	11/13/2023	11/13/2023
pH	SU	7.04	7.14	7.10	7.06	6.95	6.95
BORON, TOTAL	µg/L	57.9 J	58.9 J	1,700	93.7 J	93.3 J	120
CALCIUM, TOTAL	µg/L	136,000	114,000	119,000	117,000 J	132,000	134,000
CHLORIDE, TOTAL	mg/L	7.2	13.4	12.9 J	2.0 J	1.4 J	2.0 J
FLUORIDE, TOTAL	mg/L	ND	ND	ND	ND	ND	ND
SULFATE, TOTAL	mg/L	46.9	12.3	0.79 J	44.3 J	50.0 J	36.0 J
TOTAL DISSOLVED SOLIDS	mg/L	475	398	483	451	516	542

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: GTM
Checked By: JSI
Reviewed By: MNH

Figures



TITLE

SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

Legend

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)

Utility Waste Landfill Cells

- SCL4A - Dry CCR Disposal Area
- SCPC - Inactive FGD Surface Impoundment (Closure in Progress)
- SCPD - FGD Surface Impoundment

Monitoring Well Networks

- Corrective Action Monitoring Well
- SCPA Detection and Assessment Monitoring Well
- SCPB and Corrective Action Monitoring Well
- SCPB Detection Monitoring Well
- SCPC Detection Monitoring Well
- SCPD and SCPC Detection Monitoring Well
- SCPD Detection Monitoring Well
- SCL4A and Corrective Action Monitoring Well
- SCL4A Detection Monitoring Well
- Monitoring Well Used for Water Level Elevation Measurements Only

NOTES

1. All boundaries and locations are approximate.
2. FGD - Flue Gas Desulfurization.
3. CCR - Coal Combustion Residuals.

REFERENCES

1. Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.

0 500 1,000 2,000 3,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-03-29
PREPARED	JSI	PROJECT No.	23009
REVIEW	GTM		
APPROVED	MNH		

FIGURE 1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in

Path: C:\Users\GrantMoney\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings_Figures\4.3-SEC\4.3.2 - Production\Other Maps\Figure 1- SEC Well Locations.aprx

Appendix A
Laboratory Analytical Data

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

June 21, 2023

Mark Haddock
Rocksmith Geoengineering, LLC.
5233 Roanoke Drive
Saint Charles, MO 63304

RE: Project: AMEREN SCPD
Pace Project No.: 60428015

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between May 03, 2023 and May 05, 2023. 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: Jeffrey Ingram, Rocksmith Geoengineering, LLC.
Grant Morey, Rocksmith Geoengineering, LLC.

Pace Analytical Services, LLC
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Lenexa, KS 66219
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CERTIFICATIONS

Project: AMEREN SCPD
Pace Project No.: 60428015

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 88-00679
Illinois Certification #: 2000302023-5
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212023-1
Oklahoma Certification #: 2022-057
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-22-16
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: AMEREN SCPD
Pace Project No.: 60428015

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60428015001	**S-TMW-4**	Water	05/04/23 09:17	05/05/23 05:10
60428015002	**S-TMW-5**	Water	05/04/23 10:09	05/05/23 05:10
60428015003	**S-TMW-6**	Water	05/04/23 11:07	05/05/23 05:10
60428015004	**S-SCPD-DUP-1**	Water	05/04/23 08:00	05/05/23 05:10
60428015005	**S-SCPD-FB-1**	Water	05/04/23 09:27	05/05/23 05:10
60428021002	**S-UG-2**	Water	05/03/23 14:58	05/05/23 05:10
60427703001	**S-BMW-1S**	Water	05/02/23 09:51	05/03/23 05:05
60427703002	**S-BMW-3S**	Water	05/02/23 11:32	05/03/23 05:05

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN SCPD
Pace Project No.: 60428015

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60428015001	**S-TMW-4**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	MLD	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428015002	**S-TMW-5**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BMT	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428015003	**S-TMW-6**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BMT	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428015004	**S-SCPD-DUP-1**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BMT	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428015005	**S-SCPD-FB-1**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BMT	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428021002	**S-UG-2**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	MLD	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60427703001	**S-BMW-1S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60427703002	**S-BMW-3S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-TMW-4 **Lab ID: 60428015001** Collected: 05/04/23 09:17 Received: 05/05/23 05:10 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	**99.5J**	ug/L	100	6.4	1	05/11/23 11:53	05/15/23 09:25	7440-42-8	
Calcium	**130000**	ug/L	200	26.9	1	05/11/23 11:53	05/15/23 09:25	7440-70-2	
Iron	**15.1J**	ug/L	50.0	9.1	1	05/11/23 11:53	05/15/23 09:25	7439-89-6	
Magnesium	**32000**	ug/L	50.0	20.1	1	05/11/23 11:53	05/15/23 09:25	7439-95-4	
Manganese	**253**	ug/L	5.0	0.39	1	05/11/23 11:53	05/15/23 09:25	7439-96-5	
Potassium	**6110**	ug/L	500	69.7	1	05/11/23 11:53	05/15/23 09:25	7440-09-7	
Sodium	**4940**	ug/L	500	115	1	05/11/23 11:53	05/15/23 09:25	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**422**	mg/L	20.0	10.5	1		05/09/23 09:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**331**	mg/L	10.0	10.0	1		05/10/23 09:23		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.1**	mg/L	1.0	0.53	1		05/11/23 19:11	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/11/23 19:11	16984-48-8	
Sulfate	**38.3**	mg/L	10.0	5.5	10		05/11/23 19:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-TMW-5 **Lab ID: 60428015002** Collected: 05/04/23 10:09 Received: 05/05/23 05:10 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	**95.7J**	ug/L	100	6.4	1	05/11/23 11:53	05/15/23 09:27	7440-42-8	
Calcium	**140000**	ug/L	200	26.9	1	05/11/23 11:53	05/15/23 09:27	7440-70-2	
Iron	**13.3J**	ug/L	50.0	9.1	1	05/11/23 11:53	05/15/23 09:27	7439-89-6	
Magnesium	**29500**	ug/L	50.0	20.1	1	05/11/23 11:53	05/15/23 09:27	7439-95-4	
Manganese	**274**	ug/L	5.0	0.39	1	05/11/23 11:53	05/15/23 09:27	7439-96-5	
Potassium	**5590**	ug/L	500	69.7	1	05/11/23 11:53	05/15/23 09:27	7440-09-7	
Sodium	**4640**	ug/L	500	115	1	05/11/23 11:53	05/15/23 09:27	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**451**	mg/L	20.0	10.5	1		05/09/23 11:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**526**	mg/L	10.0	10.0	1		05/11/23 09:17		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**1.9**	mg/L	1.0	0.53	1		05/11/23 20:05	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/11/23 20:05	16984-48-8	
Sulfate	**39.7**	mg/L	10.0	5.5	10		05/11/23 20:58	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-TMW-6 **Lab ID: 60428015003** Collected: 05/04/23 11:07 Received: 05/05/23 05:10 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	6.4	1	05/11/23 11:53	05/15/23 09:33	7440-42-8	
Calcium	**141000**	ug/L	200	26.9	1	05/11/23 11:53	05/15/23 09:33	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	05/11/23 11:53	05/15/23 09:33	7439-89-6	
Magnesium	**29600**	ug/L	50.0	20.1	1	05/11/23 11:53	05/15/23 09:33	7439-95-4	
Manganese	**195**	ug/L	5.0	0.39	1	05/11/23 11:53	05/15/23 09:33	7439-96-5	
Potassium	**39100**	ug/L	500	69.7	1	05/11/23 11:53	05/15/23 09:33	7440-09-7	
Sodium	**5490**	ug/L	500	115	1	05/11/23 11:53	05/15/23 09:33	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**503**	mg/L	20.0	10.5	1		05/09/23 11:59		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**566**	mg/L	10.0	10.0	1		05/11/23 09:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.7**	mg/L	1.0	0.53	1		05/11/23 21:52	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/11/23 21:52	16984-48-8	
Sulfate	**30.7**	mg/L	10.0	5.5	10		05/11/23 22:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-SCPD-DUP-1 **Lab ID: 60428015004** Collected: 05/04/23 08:00 Received: 05/05/23 05:10 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	**116**	ug/L	100	6.4	1	05/11/23 11:53	05/15/23 09:35	7440-42-8	
Calcium	**140000**	ug/L	200	26.9	1	05/11/23 11:53	05/15/23 09:35	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	05/11/23 11:53	05/15/23 09:35	7439-89-6	
Magnesium	**29400**	ug/L	50.0	20.1	1	05/11/23 11:53	05/15/23 09:35	7439-95-4	
Manganese	**198**	ug/L	5.0	0.39	1	05/11/23 11:53	05/15/23 09:35	7439-96-5	
Potassium	**38000**	ug/L	500	69.7	1	05/11/23 11:53	05/15/23 09:35	7440-09-7	
Sodium	**5430**	ug/L	500	115	1	05/11/23 11:53	05/15/23 09:35	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**506**	mg/L	20.0	10.5	1		05/09/23 12:07		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**66.0**	mg/L	10.0	10.0	1		05/11/23 09:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.8**	mg/L	1.0	0.53	1		05/11/23 22:45	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/11/23 22:45	16984-48-8	
Sulfate	**31.2**	mg/L	10.0	5.5	10		05/11/23 22:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-SCPD-FB-1 **Lab ID: 60428015005** Collected: 05/04/23 09:27 Received: 05/05/23 05:10 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	**<6.4**	ug/L	100	6.4	1	05/11/23 11:53	05/15/23 09:37	7440-42-8	
Calcium	**27.1J**	ug/L	200	26.9	1	05/11/23 11:53	05/15/23 09:37	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	05/11/23 11:53	05/15/23 09:37	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	05/11/23 11:53	05/15/23 09:37	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	05/11/23 11:53	05/15/23 09:37	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	05/11/23 11:53	05/15/23 09:37	7440-09-7	
Sodium	**<115**	ug/L	500	115	1	05/11/23 11:53	05/15/23 09:37	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		05/09/23 12:14		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**417**	mg/L	5.0	5.0	1		05/11/23 09:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		05/11/23 23:12	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/11/23 23:12	16984-48-8	
Sulfate	**<0.55**	mg/L	1.0	0.55	1		05/11/23 23:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-UG-2 **Lab ID: 60428021002** Collected: 05/03/23 14:58 Received: 05/05/23 05:10 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	**458**	ug/L	100	6.4	1	05/11/23 11:53	05/15/23 10:16	7440-42-8	
Calcium	**115000**	ug/L	200	26.9	1	05/11/23 11:53	05/15/23 10:16	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	05/11/23 11:53	05/15/23 10:16	7439-89-6	
Magnesium	**23200**	ug/L	50.0	20.1	1	05/11/23 11:53	05/15/23 10:16	7439-95-4	
Manganese	**35.3**	ug/L	5.0	0.39	1	05/11/23 11:53	05/15/23 10:16	7439-96-5	
Potassium	**4180**	ug/L	500	69.7	1	05/11/23 11:53	05/15/23 10:16	7440-09-7	
Sodium	**26000**	ug/L	500	115	1	05/11/23 11:53	05/15/23 10:16	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**355**	mg/L	20.0	10.5	1		05/09/23 10:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**496**	mg/L	10.0	10.0	1		05/10/23 09:23		D6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**37.2**	mg/L	10.0	5.3	10		05/12/23 08:57	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/12/23 08:44	16984-48-8	
Sulfate	**51.8**	mg/L	10.0	5.5	10		05/12/23 08:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-BMW-1S **Lab ID: 60427703001** Collected: 05/02/23 09:51 Received: 05/03/23 05:05 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	**64.8J**	ug/L	100	6.4	1	05/04/23 12:37	05/23/23 09:21	7440-42-8	
Calcium	**184000**	ug/L	200	26.9	1	05/04/23 12:37	05/23/23 09:21	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	05/04/23 12:37	05/23/23 09:21	7439-89-6	
Magnesium	**37100**	ug/L	50.0	20.1	1	05/04/23 12:37	05/23/23 09:21	7439-95-4	
Manganese	**849**	ug/L	5.0	0.39	1	05/04/23 12:37	05/23/23 09:21	7439-96-5	
Potassium	**427J**	ug/L	500	69.7	1	05/04/23 12:37	05/23/23 09:21	7440-09-7	
Sodium	**5130**	ug/L	500	115	1	05/04/23 12:37	05/23/23 09:21	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**576**	mg/L	20.0	10.5	1		05/04/23 13:12		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**610**	mg/L	10.0	10.0	1		05/08/23 12:51		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**13.1**	mg/L	1.0	0.53	1		05/24/23 18:29	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/24/23 18:29	16984-48-8	
Sulfate	**37.7**	mg/L	20.0	11.0	20		05/24/23 18:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60428015

Sample: S-BMW-3S **Lab ID: 60427703002** Collected: 05/02/23 11:32 Received: 05/03/23 05:05 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	**67.1J**	ug/L	100	6.4	1	05/04/23 12:37	05/23/23 09:27	7440-42-8	
Calcium	**137000**	ug/L	200	26.9	1	05/04/23 12:37	05/23/23 09:27	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	05/04/23 12:37	05/23/23 09:27	7439-89-6	
Magnesium	**24400**	ug/L	50.0	20.1	1	05/04/23 12:37	05/23/23 09:27	7439-95-4	
Manganese	**30.2**	ug/L	5.0	0.39	1	05/04/23 12:37	05/23/23 09:27	7439-96-5	
Potassium	**426J**	ug/L	500	69.7	1	05/04/23 12:37	05/23/23 09:27	7440-09-7	
Sodium	**5360**	ug/L	500	115	1	05/04/23 12:37	05/23/23 09:27	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**419**	mg/L	20.0	10.5	1		05/04/23 13:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**495**	mg/L	10.0	10.0	1		05/09/23 10:54		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**12.6**	mg/L	1.0	0.53	1		05/24/23 18:54	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/24/23 18:54	16984-48-8	
Sulfate	**32.4**	mg/L	20.0	11.0	20		05/24/23 19:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 845219
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: 60427703001, 60427703002

METHOD BLANK: 3349216 Matrix: Water
Associated Lab Samples: 60427703001, 60427703002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	05/23/23 09:16	
Calcium	ug/L	28.7J	200	26.9	05/23/23 09:16	
Iron	ug/L	9.3J	50.0	9.1	05/23/23 09:16	
Magnesium	ug/L	<20.1	50.0	20.1	05/23/23 09:16	
Manganese	ug/L	1.1J	5.0	0.39	05/23/23 09:16	
Potassium	ug/L	<69.7	500	69.7	05/23/23 09:16	
Sodium	ug/L	<115	500	115	05/23/23 09:16	

LABORATORY CONTROL SAMPLE: 3349217

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	994	99	85-115	
Calcium	ug/L	10000	10500	105	85-115	
Iron	ug/L	10000	10500	105	85-115	
Magnesium	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	1030	103	85-115	
Potassium	ug/L	10000	10200	102	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3349218 3349219

Parameter	Units	60427703001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	64.8J	1000	1000	1050	1050	98	98	70-130	0	20	
Calcium	ug/L	184000	10000	10000	191000	195000	73	109	70-130	2	20	
Iron	ug/L	<9.1	10000	10000	10400	10400	104	104	70-130	0	20	
Magnesium	ug/L	37100	10000	10000	47000	47300	99	102	70-130	1	20	
Manganese	ug/L	849	1000	1000	1860	1890	102	104	70-130	1	20	
Potassium	ug/L	427J	10000	10000	10900	10800	104	104	70-130	0	20	
Sodium	ug/L	5130	10000	10000	15600	15700	104	106	70-130	1	20	

MATRIX SPIKE SAMPLE: 3349220

Parameter	Units	60427703007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	101	1000	1070	97	70-130	
Calcium	ug/L	132000	10000	139000	75	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

MATRIX SPIKE SAMPLE: 3349220

Parameter	Units	60427703007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	143	10000	10200	100	70-130	
Magnesium	ug/L	28500	10000	37900	94	70-130	
Manganese	ug/L	216	1000	1200	99	70-130	
Potassium	ug/L	2250	10000	12500	102	70-130	
Sodium	ug/L	5580	10000	15800	102	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846620
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: 60428015001, 60428015002, 60428015003, 60428015004, 60428015005

METHOD BLANK: 3354480 Matrix: Water
Associated Lab Samples: 60428015001, 60428015002, 60428015003, 60428015004, 60428015005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	05/15/23 09:21	
Calcium	ug/L	<26.9	200	26.9	05/15/23 09:21	
Iron	ug/L	<9.1	50.0	9.1	05/15/23 09:21	
Magnesium	ug/L	<20.1	50.0	20.1	05/15/23 09:21	
Manganese	ug/L	<0.39	5.0	0.39	05/15/23 09:21	
Potassium	ug/L	<69.7	500	69.7	05/15/23 09:21	
Sodium	ug/L	<115	500	115	05/15/23 09:21	

LABORATORY CONTROL SAMPLE: 3354481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	985	99	85-115	
Calcium	ug/L	10000	10400	104	85-115	
Iron	ug/L	10000	10700	107	85-115	
Magnesium	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	1050	105	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Sodium	ug/L	10000	10200	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3354482 3354483

Parameter	Units	60428015002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	95.7J	1000	1000	1110	1110	101	102	70-130	0	20	
Calcium	ug/L	140000	10000	10000	150000	151000	100	109	70-130	1	20	
Iron	ug/L	13.3J	10000	10000	10600	10500	105	105	70-130	0	20	
Magnesium	ug/L	29500	10000	10000	40000	40200	105	107	70-130	1	20	
Manganese	ug/L	274	1000	1000	1300	1290	102	102	70-130	0	20	
Potassium	ug/L	5590	10000	10000	16100	16200	105	106	70-130	0	20	
Sodium	ug/L	4640	10000	10000	15100	15100	105	105	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846622
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: 60428021002

METHOD BLANK: 3354495 Matrix: Water
Associated Lab Samples: 60428021002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	05/15/23 10:10	
Calcium	ug/L	<26.9	200	26.9	05/15/23 10:10	
Iron	ug/L	<9.1	50.0	9.1	05/15/23 10:10	
Magnesium	ug/L	<20.1	50.0	20.1	05/15/23 10:10	
Manganese	ug/L	<0.39	5.0	0.39	05/15/23 10:10	
Potassium	ug/L	<69.7	500	69.7	05/15/23 10:10	
Sodium	ug/L	<115	500	115	05/15/23 10:10	

LABORATORY CONTROL SAMPLE: 3354496

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	965	97	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Iron	ug/L	10000	10100	101	85-115	
Magnesium	ug/L	10000	10000	100	85-115	
Manganese	ug/L	1000	962	96	85-115	
Potassium	ug/L	10000	9870	99	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3354497 3354498

Parameter	Units	60428021005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	83.6J	1000	1000	1050	1060	97	98	70-130	1	20	
Calcium	ug/L	159000	10000	10000	171000	170000	111	102	70-130	1	20	
Iron	ug/L	238	10000	10000	10200	10200	100	99	70-130	0	20	
Magnesium	ug/L	35600	10000	10000	46100	45700	105	101	70-130	1	20	
Manganese	ug/L	526	1000	1000	1500	1480	97	95	70-130	1	20	
Potassium	ug/L	5630	10000	10000	15700	15800	101	102	70-130	1	20	
Sodium	ug/L	4830	10000	10000	14900	14700	101	99	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 845171
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60427703001, 60427703002

METHOD BLANK: 3349039 Matrix: Water
Associated Lab Samples: 60427703001, 60427703002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	05/04/23 11:49	

LABORATORY CONTROL SAMPLE: 3349040

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	503	101	90-110	

SAMPLE DUPLICATE: 3349041

Parameter	Units	60427704003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	198	195	2	10	

SAMPLE DUPLICATE: 3349299

Parameter	Units	60427707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	160	163	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846049 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428015001, 60428015002, 60428015003, 60428015004, 60428015005, 60428021002

METHOD BLANK: 3352393 Matrix: Water
Associated Lab Samples: 60428015001, 60428015002, 60428015003, 60428015004, 60428015005, 60428021002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	05/09/23 09:16	

LABORATORY CONTROL SAMPLE: 3352394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	504	101	90-110	

SAMPLE DUPLICATE: 3352395

Parameter	Units	60428021005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	480	476	1	10	

SAMPLE DUPLICATE: 3352396

Parameter	Units	60428015002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	451	454	1	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 SCPD
Pace Project No.: 60428015

QC Batch: 845831
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60427703001

METHOD BLANK: 3351717 Matrix: Water
Associated Lab Samples: 60427703001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/08/23 12:49	

LABORATORY CONTROL SAMPLE: 3351718

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

SAMPLE DUPLICATE: 3351719

Parameter	Units	60427607001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3540	3470	2	10	

SAMPLE DUPLICATE: 3351720

Parameter	Units	60427705002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	<5.0		10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846023
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60427703002

METHOD BLANK: 3352331 Matrix: Water
Associated Lab Samples: 60427703002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/09/23 10:54	

LABORATORY CONTROL SAMPLE: 3352332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1030	103	80-120	

SAMPLE DUPLICATE: 3352333

Parameter	Units	60427707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	957	916	4	10	

SAMPLE DUPLICATE: 3352334

Parameter	Units	60427777001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	972	913	6	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

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846260
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428015001

METHOD BLANK: 3353152 Matrix: Water
Associated Lab Samples: 60428015001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/10/23 09:20	

LABORATORY CONTROL SAMPLE: 3353153

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	974	97	80-120	

SAMPLE DUPLICATE: 3353154

Parameter	Units	60427854002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2740	2870	5	10	

SAMPLE DUPLICATE: 3353156

Parameter	Units	60427860002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	445	445	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846264
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428021002

METHOD BLANK: 3353161 Matrix: Water
Associated Lab Samples: 60428021002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/10/23 09:23	

LABORATORY CONTROL SAMPLE: 3353162

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

SAMPLE DUPLICATE: 3353163

Parameter	Units	60428021005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	640	646	1	10	D6

SAMPLE DUPLICATE: 3353164

Parameter	Units	60428144001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	426	463	8	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846518
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428015002, 60428015003, 60428015004, 60428015005

METHOD BLANK: 3354150 Matrix: Water
Associated Lab Samples: 60428015002, 60428015003, 60428015004, 60428015005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/11/23 09:17	

LABORATORY CONTROL SAMPLE: 3354151

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 3354353

Parameter	Units	60428015002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	526	518	2	10	

SAMPLE DUPLICATE: 3354354

Parameter	Units	60428019003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	319	352	10	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 846459
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: 60428015001, 60428015002, 60428015003, 60428015004, 60428015005, 60428021002

METHOD BLANK: 3353923 Matrix: Water
Associated Lab Samples: 60428015001, 60428015002, 60428015003, 60428015004, 60428015005, 60428021002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	05/11/23 18:45	
Fluoride	mg/L	<0.12	0.20	0.12	05/11/23 18:45	
Sulfate	mg/L	<0.55	1.0	0.55	05/11/23 18:45	

LABORATORY CONTROL SAMPLE: 3353924

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	2.4	96	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3353925 3353926

Parameter	Units	60428015002 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	7.1	7.0	105	104	80-120	1	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.9	2.9	116	114	80-120	1	15	
Sulfate	mg/L	39.7	50	50	105	94.5	130	110	80-120	10	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3353928 3353929

Parameter	Units	60428019003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.6	5	5	9.0	9.3	107	114	80-120	4	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.7	2.9	109	116	80-120	7	15	
Sulfate	mg/L	40.9	50	50	95.7	95.2	110	109	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3353931 3353932

Parameter	Units	60428021005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.9	5	5	12.6	12.7	114	117	80-120	1	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.9	2.9	114	116	80-120	2	15	
Sulfate	mg/L	76.3	50	50	128	129	103	106	80-120	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

SAMPLE DUPLICATE: 3353927

Parameter	Units	60428015002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1.9	1.9	0	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	39.7	39.0	2	15	

SAMPLE DUPLICATE: 3353930

Parameter	Units	60428019003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	3.6	3.9	7	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	40.9	41.9	2	15	

SAMPLE DUPLICATE: 3353933

Parameter	Units	60428021005 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	6.9	6.9	1	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	76.3	70.6	8	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60428015

QC Batch: 848462
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: 60427703001, 60427703002

METHOD BLANK: 3361725 Matrix: Water
Associated Lab Samples: 60427703001, 60427703002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	05/24/23 09:13	
Fluoride	mg/L	<0.12	0.20	0.12	05/24/23 09:13	
Sulfate	mg/L	<0.55	1.0	0.55	05/24/23 09:13	

LABORATORY CONTROL SAMPLE: 3361726

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	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3361727 3361728

Parameter	Units	60428838004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.6	5	5	6.0	6.2	88	91	80-120	3	15	
Fluoride	mg/L	0.21	2.5	2.5	2.7	2.7	98	101	80-120	3	15	
Sulfate	mg/L	193	250	250	450	427	103	94	80-120	5	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN SCPD
Pace Project No.: 60428015

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.

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPD
Pace Project No.: 60428015

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60427703001	**S-BMW-1S**	EPA 200.7	845219	EPA 200.7	845416
60427703002	**S-BMW-3S**	EPA 200.7	845219	EPA 200.7	845416
60428015001	**S-TMW-4**	EPA 200.7	846620	EPA 200.7	846675
60428015002	**S-TMW-5**	EPA 200.7	846620	EPA 200.7	846675
60428015003	**S-TMW-6**	EPA 200.7	846620	EPA 200.7	846675
60428015004	**S-SCPD-DUP-1**	EPA 200.7	846620	EPA 200.7	846675
60428015005	**S-SCPD-FB-1**	EPA 200.7	846620	EPA 200.7	846675
60428021002	**S-UG-2**	EPA 200.7	846622	EPA 200.7	846678
60427703001	**S-BMW-1S**	SM 2320B	845171		
60427703002	**S-BMW-3S**	SM 2320B	845171		
60428015001	**S-TMW-4**	SM 2320B	846049		
60428015002	**S-TMW-5**	SM 2320B	846049		
60428015003	**S-TMW-6**	SM 2320B	846049		
60428015004	**S-SCPD-DUP-1**	SM 2320B	846049		
60428015005	**S-SCPD-FB-1**	SM 2320B	846049		
60428021002	**S-UG-2**	SM 2320B	846049		
60427703001	**S-BMW-1S**	SM 2540C	845831		
60427703002	**S-BMW-3S**	SM 2540C	846023		
60428015001	**S-TMW-4**	SM 2540C	846260		
60428015002	**S-TMW-5**	SM 2540C	846518		
60428015003	**S-TMW-6**	SM 2540C	846518		
60428015004	**S-SCPD-DUP-1**	SM 2540C	846518		
60428015005	**S-SCPD-FB-1**	SM 2540C	846518		
60428021002	**S-UG-2**	SM 2540C	846264		
60427703001	**S-BMW-1S**	EPA 300.0	848462		
60427703002	**S-BMW-3S**	EPA 300.0	848462		
60428015001	**S-TMW-4**	EPA 300.0	846459		
60428015002	**S-TMW-5**	EPA 300.0	846459		
60428015003	**S-TMW-6**	EPA 300.0	846459		
60428015004	**S-SCPD-DUP-1**	EPA 300.0	846459		
60428015005	**S-SCPD-FB-1**	EPA 300.0	846459		
60428021002	**S-UG-2**	EPA 300.0	846459		

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sam	WO# : 60428015
	Revision: 2	Effective Date: 01/12/2

60428015

Client Name: Rocksmith

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 ☐

Thermometer Used: T-299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.6/0.1/2.3 **Corr. Factor** +0.2 **Corrected** 1.8/0.3/2.5

Date and initials of person examining contents: BC 5/5

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#:** 67187	☒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: _____

Project Manager Review: _____ Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical
www.pacelabs.com

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Rocksmith Geoengineers, LLC.	Report To:	Mark Haddock	Attention:	
Address:	5233 Roanoke Drive	Copy To:	Jeffrey Ingram	Company Name:	Rocksmith
	St. Charles, MO 63304			Address:	
Email To:	mark.haddock@rocksmithgeo.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	314-974-6578 Fax:	Project Name:	AMEREN SCPD	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	COC #12	Pace Profile #:	15856, line 2

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	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	Y/N	Analysis Test: Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Appendix IV Metals **	Mercury	Radium 226	Radium 228	Ferrous/Ferric Iron	SM4500-S2D Sulfide			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Requested Analysis Filtered (Y/N)	N	N	N	N	N	N	N	N	N	N				60428015
1	S-UG-2	WT	G			5-3-23	1458		2	1		1							✓	✓	✓	✓									
2	S-TMW-4	WT	G			5-4-23	0917		2	1		1							✓	✓	✓	✓									Sample Date/Time: 5-4-23 0917
3	S-TMW-5	WT	G			5-4-23	1009		2	1		1							✓	✓	✓	✓									
4	S-TMW-6	WT	G			5-4-23	1107		2	1		1							✓	✓	✓	✓									
5	S-SCPD-DUP-1	WT	G			5-4-23	—		2	1		1							✓	✓	✓	✓									
6	S-SCPD-FB-1	WT	G			5-4-23	0927		2	1		1							✓	✓	✓	✓									
7	S-SCPD-MS-1	WT	G			5-4-23	1009		2	1		1							✓	✓	✓	✓									Collected @ S-TMW-5
8	S-SCPD-MSD-1	WT	G			5-4-23	1009		2	1		1							✓	✓	✓	✓									Collected @ S-TMW-5
9	S-BMW-1S	WT	G																											
10	S-BMW-3S	WT	G																											
11		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: B, Ca, Fe, Mg, Mn, K, Na	Grant Morey / WSP	5-4-23	1600	[signature]	5/5	0510	1.8	Y	Y	Y
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl							0.3			
							2.5			
Radium 226/228 to Pace PA										

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Grant Morey					
SIGNATURE of SAMPLER:	[signature]	DATE Signed (MM/DD/YY): 05/04/23				

Memorandum

June 27, 2023

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23009
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	Grant.Morey@Rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCPD – Data Package 60428015**		

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPD
Project Number: 23009
Reviewer: G. Morey
Validation Date: 6/27/2023

Laboratory: Pace Analytical
SDG #: 60428015
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions);
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-TMW-4, S-TMW-5, S-TMW-6, S-SCPD-DUP-1, S-SCPD-FB-1, S-UG-2, 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			5/2/2023 - 5/4/2023
b) Sampling team indicated?	x			GTM
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, Spec 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	No lab narrative.

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		

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			

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

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			
Recovery could not be calculated since sample contained high concentration of analyte?			x	
c) Were MS/MSD precision criteria met?	x			

Comments/Notes:

General:

Chloride and/or Sulfate were diluted in some samples; no qualification necessary.

Method Blanks:

3349216: Calcium (28.7J), Iron (9.3J), and Manganese (1.1J). Associated with samples -001 and -002.

Calcium and Manganese results > RL and 10x blank, no qualification necessary. Iron results non-detect, no qualification.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Field Blanks:

S-SCPD-FB-1 @ S-TMW-4: Calcium (27.1J) and TDS (417). Calcium result > RL and 10x blank, no qualification necessary. TDS result < 10x blank, result qualified as estimate.

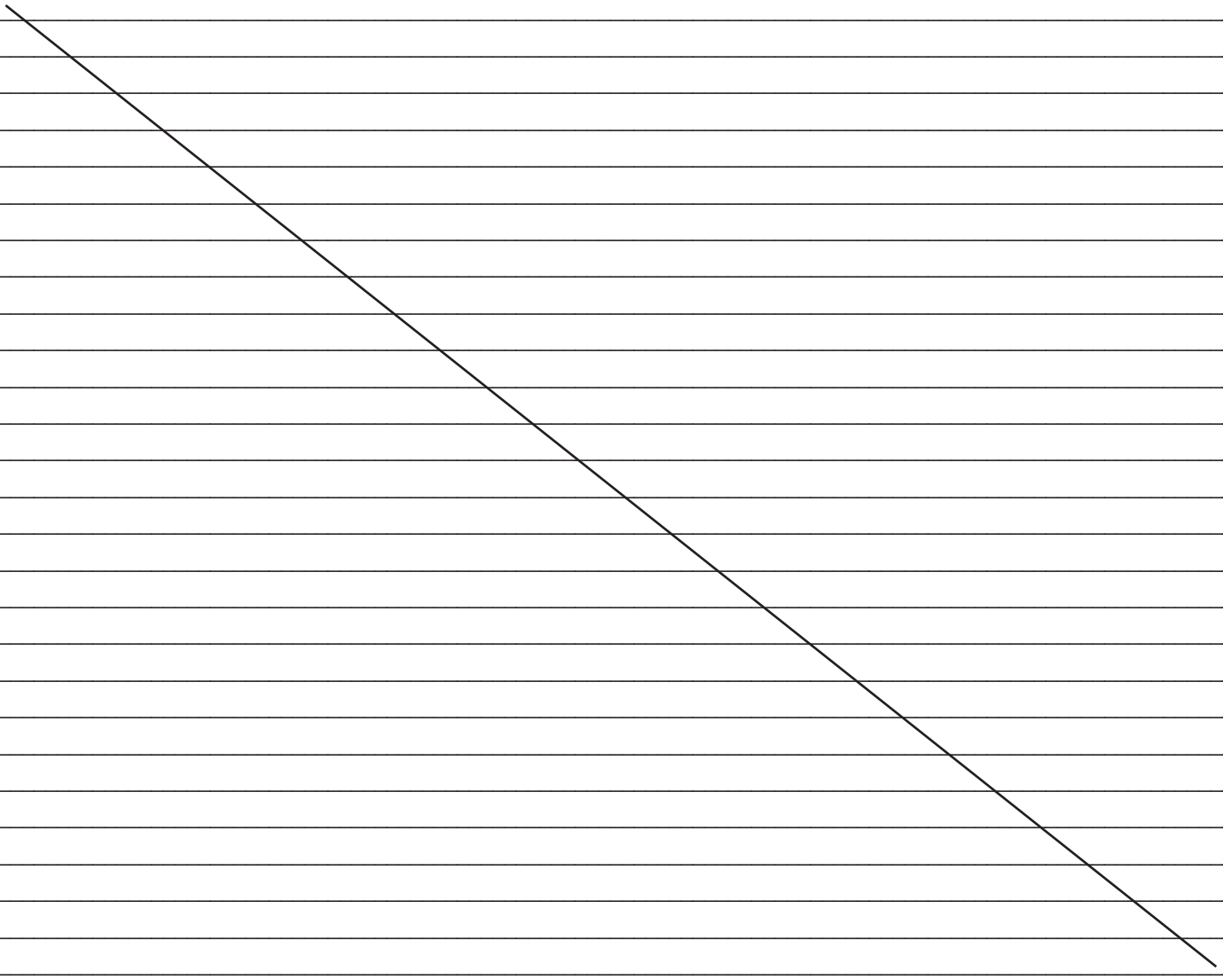
Duplicates:

S-SCPD-DUP-1 @ S-TMW-6: TDS RPD (158%) exceeds control limits, results qualified as estimates.

Lab duplicate Max RPD: 10%: Alkalinity, TDS; 15%: Chloride, Fluoride, Sulfate

MS/MSD:

3353925/3353926: MS recovery high for Sulfate (only 1 QC indicator out); no qualification necessary.



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-TMW-4	TDS	331	J	Detected in field blank, result < 10x blank
S-SCPD-DUP-1	"	66.0	J	Field DUP RPD exceeds control limits
S-TMW-6	"	566	J	"

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 06/27/2023

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

July 25, 2023

Mark Haddock
Rocksmith Geoengineering, LLC.
5233 Roanoke Drive
Saint Charles, MO 63304

RE: Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on July 12, 2023. 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: Jeffrey Ingram, Rocksmith Geoengineering, LLC.
Grant Morey, Rocksmith Geoengineering, LLC.

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 88-00679
Illinois Certification #: 2000302023-5
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212023-1
Oklahoma Certification #: 2022-057
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-22-16
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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(913)599-5665

SAMPLE SUMMARY

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60432870001	**S-SCPD-DUP-1**	Water	07/11/23 04:07	07/12/23 10:01
60432870002	**S-SCPD-FB-1**	Water	07/11/23 04:07	07/12/23 10:01
60432876001	**S-UG-2**	Water	07/11/23 09:07	07/12/23 04:58

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SAMPLE ANALYTE COUNT

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60432870001	**S-SCPD-DUP-1**	EPA 200.7	MA1	1	PASI-K
60432870002	**S-SCPD-FB-1**	EPA 200.7	MA1	1	PASI-K
60432876001	**S-UG-2**	EPA 200.7	MA1	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Sample: S-SCPD-DUP-1 **Lab ID: 60432870001** Collected: 07/11/23 04:07 Received: 07/12/23 10:01 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	**293**	ug/L	100	6.4	1	07/18/23 13:01	07/24/23 15:38	7440-42-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Sample: S-SCPD-FB-1 **Lab ID: 60432870002** Collected: 07/11/23 04:07 Received: 07/12/23 10:01 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	**<6.4**	ug/L	100	6.4	1	07/18/23 13:01	07/24/23 15:47	7440-42-8	

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ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Sample: S-UG-2 **Lab ID: 60432876001** Collected: 07/11/23 09:07 Received: 07/12/23 04:58 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	**291**	ug/L	100	6.4	1	07/18/23 13:01	07/24/23 15:50	7440-42-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

QC Batch: 856954
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: 60432870001, 60432870002, 60432876001

METHOD BLANK: 3393503 Matrix: Water
Associated Lab Samples: 60432870001, 60432870002, 60432876001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	07/24/23 15:20	

LABORATORY CONTROL SAMPLE: 3393504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	957	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3393505 3393506

Parameter	Units	60432860001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	299	1000	1000	1290	1280	99	98	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3393507 3393508

Parameter	Units	60432876001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	291	1000	1000	1250	1240	96	95	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3393509 3393510

Parameter	Units	60432876002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	82.5J	1000	1000	1040	1060	96	98	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
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Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

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.

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

TNI - The NELAC Institute.

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Lenexa, KS 66219
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN-VERIFICATION, SCPD
Pace Project No.: 60432870

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60432870001	**S-SCPD-DUP-1**	EPA 200.7	856954	EPA 200.7	856964
60432870002	**S-SCPD-FB-1**	EPA 200.7	856954	EPA 200.7	856964
60432876001	**S-UG-2**	EPA 200.7	856954	EPA 200.7	856964

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sampl	WO# : 60432870
	Revision: 2	Effective Date: 01/12/20

60432870

Client Name: Rocksmith

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 ☑ Ziplc

Thermometer Used: T299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.5 **Corr. Factor** +0.2 **Corrected** 1.7

Date and initials of person examining contents: 07.12.2023 4

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#:** 67187	☑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: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Page 1 of 1

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:	Rocksmith Geoengineering, LLC
Address:	5233 Roanoke Drive
	St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone: 314-974-5678	Fax:
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffery Ingram, Grant Morey
Purchase Order No.:	COC #1
Project Name:	Ameren - Verification Sampling
Project Number:	COC#1

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15856, 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

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	TDS	Sulfate	Chloride	Boron	TOX	Calcium					Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Requested Analysis Filtered (Y/N)																		N	N	N	N	N	N	N	N	N		
1	S-UG-2	WT	G			7/11	907		1			1										1							60432870
2	S-SLPD-DUP-1	WT	G						1			1										1							
3	S-SLPD-MS	WT	G						1			1										1							Collected for UG-2
4	S-SLPD-MSD	WT	G						1			1										1							on
5	S-SLPD-FB-1	WT	G						1			1										1							
6		WT	G																										
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	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	J. Ingram / Rocksmith	7/11/23	1330		7.12.23	0458	1.7	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Ingram

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 7/11/23

*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.

Client: Rock Smith Profile #

Site: American - Ver. Sam Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1			No Samp																													
2	WT																						1									
3			No sample																													
4																																
5	WT																						1									
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Container Codes

Glass				Plastic		Misc.	
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar	BP1C	1L NAOH plastic	I	Wipe/Swab
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar	BP1N	1L HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar	BP1S	1L H2SO4 plastic	ZPLC	Ziploc Bag
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide	BP1U	1L unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass	BP1Z	1L NaOH, Zn Acetate	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass	BP2C	500mL NAOH plastic	R	Terracore Kit
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass	BP2N	500mL HNO3 plastic	U	Summa Can
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass	BP2S	500mL H2SO4 plastic		
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic		
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Acetate	Matrix	
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass	BP3C	250mL NaOH plastic		
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic - field filtered	WT	Water
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic	SL	Solid
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic	NAL	Non-aqueous Liquid
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass	BP3S	250mL H2SO4 plastic	OL	OIL
		AG5U	100mL unpres amber glass	BP3Z	250mL NaOH, Zn Acetate	WP	Wipe
				BP4U	125mL unpreserved plastic	DW	Drinking Water
				BP4N	125mL HNO3 plastic		
				BP4S	125mL H2SO4 plastic		
				WPDU	16oz unpresserved plstic		

Work Order Number: 60432870

Memorandum

August 16, 2023

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23009
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	Grant.Morey@Rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCPD Verification – Data Package 60432870**		

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

- None.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPD Verification
Project Number: 23009
Reviewer: G. Morey
Validation Date: 8/16/2023

Laboratory: Pace Analytical
SDG #: 60432870
Analytical Method (type and no.): EPA 200.7 (Boron)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-SCPD-DUP-1, S-SCPD-FB-1, S-UG-2

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			7/11/2023
b) Sampling team indicated?	x			JSI
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, Spec 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	No lab narrative.

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		

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-SCPD-FB-1 @ S-UG-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-SCPD-DUP-1 @ S-UG-2
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	RPD = 0.68%
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?	☒	☐	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☐	
b) Was MSD accuracy criteria met?	☒	☐	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☐	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Comments/Notes:

No qualifications necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 08/16/2023

Pace Analytical Services, LLC
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(913)599-5665

December 27, 2023

Mark Haddock
Rocksmith Geoengineering, LLC.
2320 Creve Coeur Mill Road
Maryland Heights, MO 63043

RE: Project: AMEREN SCPD
Pace Project No.: 60442105

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between November 11, 2023 and November 15, 2023. 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, 12/27/23: S-UG-2 added

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: Jeffrey Ingram, Rocksmith Geoengineering, LLC.
Grant Morey, Rocksmith Geoengineering, LLC.

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN SCPD
Pace Project No.: 60442105

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 88-00679
Illinois Certification #: 2000302023-5
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212023-1
Oklahoma Certification #: 2022-057
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-23-17
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: AMEREN SCPD
Pace Project No.: 60442105

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60442105001	**S-TMW-4**	Water	11/13/23 13:48	11/15/23 05:11
60442105002	**S-TMW-5**	Water	11/13/23 14:38	11/15/23 05:11
60442105003	**S-TMW-6**	Water	11/13/23 15:27	11/15/23 05:11
60442105004	**S-SCPD-DUP-1**	Water	11/13/23 08:00	11/15/23 05:11
60442105005	**S-SCPD-FB-1**	Water	11/13/23 14:27	11/15/23 05:11
60442112002	**S-UG-2**	Water	11/13/23 10:53	11/15/23 05:11
60441897001	**S-BMW-1S**	Water	11/10/23 09:57	11/11/23 04:50
60441897002	**S-BMW-3S**	Water	11/10/23 09:18	11/11/23 04:50

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPD
Pace Project No.: 60442105

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60442105001	**S-TMW-4**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442105002	**S-TMW-5**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442105003	**S-TMW-6**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442105004	**S-SCPD-DUP-1**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442105005	**S-SCPD-FB-1**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442112002	**S-UG-2**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60441897001	**S-BMW-1S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60441897002	**S-BMW-3S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-TMW-4 **Lab ID: 60442105001** Collected: 11/13/23 13:48 Received: 11/15/23 05:11 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	**93.7J**	ug/L	100	6.4	1	11/30/23 10:05	12/06/23 09:59	7440-42-8	
Calcium	**117000**	ug/L	200	26.9	1	11/30/23 10:05	12/06/23 09:59	7440-70-2	M1
Iron	**<9.1**	ug/L	50.0	9.1	1	11/30/23 10:05	12/06/23 09:59	7439-89-6	
Magnesium	**30400**	ug/L	50.0	20.1	1	11/30/23 10:05	12/06/23 09:59	7439-95-4	
Manganese	**695**	ug/L	5.0	0.39	1	11/30/23 10:05	12/06/23 09:59	7439-96-5	
Potassium	**5880**	ug/L	500	69.7	1	11/30/23 10:05	12/06/23 09:59	7440-09-7	
Sodium	**4970**	ug/L	500	115	1	11/30/23 10:05	12/06/23 09:59	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**363**	mg/L	20.0	10.5	1		11/22/23 20:17		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**451**	mg/L	10.0	10.0	1		11/20/23 13:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.0**	mg/L	1.0	0.53	1		12/12/23 10:58	16887-00-6	H1
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/12/23 10:58	16984-48-8	H1,L1
Sulfate	**44.3**	mg/L	10.0	5.5	10		12/12/23 11:43	14808-79-8	H1,M1, R1

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-TMW-5 **Lab ID: 60442105002** Collected: 11/13/23 14:38 Received: 11/15/23 05:11 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	**93.3J**	ug/L	100	6.4	1	11/30/23 10:05	12/06/23 10:05	7440-42-8	
Calcium	**132000**	ug/L	200	26.9	1	11/30/23 10:05	12/06/23 10:05	7440-70-2	
Iron	**68.9**	ug/L	50.0	9.1	1	11/30/23 10:05	12/06/23 10:05	7439-89-6	
Magnesium	**26200**	ug/L	50.0	20.1	1	11/30/23 10:05	12/06/23 10:05	7439-95-4	
Manganese	**661**	ug/L	5.0	0.39	1	11/30/23 10:05	12/06/23 10:05	7439-96-5	
Potassium	**5550**	ug/L	500	69.7	1	11/30/23 10:05	12/06/23 10:05	7440-09-7	
Sodium	**4410**	ug/L	500	115	1	11/30/23 10:05	12/06/23 10:05	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**400**	mg/L	20.0	10.5	1		11/22/23 20:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**516**	mg/L	10.0	10.0	1		11/20/23 13:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**1.4**	mg/L	1.0	0.53	1		12/12/23 12:51	16887-00-6	H1
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/12/23 12:51	16984-48-8	H1,L1
Sulfate	**50.0**	mg/L	10.0	5.5	10		12/12/23 13:02	14808-79-8	H1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-TMW-6 **Lab ID: 60442105003** Collected: 11/13/23 15:27 Received: 11/15/23 05:11 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	6.4	1	11/30/23 10:05	12/06/23 10:07	7440-42-8	
Calcium	**134000**	ug/L	200	26.9	1	11/30/23 10:05	12/06/23 10:07	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	11/30/23 10:05	12/06/23 10:07	7439-89-6	
Magnesium	**28000**	ug/L	50.0	20.1	1	11/30/23 10:05	12/06/23 10:07	7439-95-4	
Manganese	**428**	ug/L	5.0	0.39	1	11/30/23 10:05	12/06/23 10:07	7439-96-5	
Potassium	**36200**	ug/L	500	69.7	1	11/30/23 10:05	12/06/23 10:07	7440-09-7	
Sodium	**5240**	ug/L	500	115	1	11/30/23 10:05	12/06/23 10:07	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**438**	mg/L	20.0	10.5	1		11/22/23 20:48		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**542**	mg/L	10.0	10.0	1		11/20/23 13:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**2.0**	mg/L	1.0	0.53	1		12/12/23 13:13	16887-00-6	H1
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/12/23 13:13	16984-48-8	H1,L1
Sulfate	**36.0**	mg/L	10.0	5.5	10		12/12/23 13:25	14808-79-8	H1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-SCPD-DUP-1 **Lab ID: 60442105004** Collected: 11/13/23 08:00 Received: 11/15/23 05:11 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	**115**	ug/L	100	6.4	1	11/30/23 10:05	12/06/23 10:09	7440-42-8	
Calcium	**130000**	ug/L	200	26.9	1	11/30/23 10:05	12/06/23 10:09	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	11/30/23 10:05	12/06/23 10:09	7439-89-6	
Magnesium	**27000**	ug/L	50.0	20.1	1	11/30/23 10:05	12/06/23 10:09	7439-95-4	
Manganese	**420**	ug/L	5.0	0.39	1	11/30/23 10:05	12/06/23 10:09	7439-96-5	
Potassium	**34400**	ug/L	500	69.7	1	11/30/23 10:05	12/06/23 10:09	7440-09-7	
Sodium	**5110**	ug/L	500	115	1	11/30/23 10:05	12/06/23 10:09	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**439**	mg/L	20.0	10.5	1		11/22/23 20:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**573**	mg/L	10.0	10.0	1		11/20/23 13:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.4**	mg/L	1.0	0.53	1		12/12/23 13:36	16887-00-6	H1
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/12/23 13:36	16984-48-8	H1,L1
Sulfate	**36.0**	mg/L	10.0	5.5	10		12/12/23 13:48	14808-79-8	H1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-SCPD-FB-1 **Lab ID: 60442105005** Collected: 11/13/23 14:27 Received: 11/15/23 05:11 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	**<6.4**	ug/L	100	6.4	1	11/30/23 10:05	12/06/23 10:17	7440-42-8	
Calcium	**<26.9**	ug/L	200	26.9	1	11/30/23 10:05	12/06/23 10:17	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	11/30/23 10:05	12/06/23 10:17	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	11/30/23 10:05	12/06/23 10:17	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	11/30/23 10:05	12/06/23 10:17	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	11/30/23 10:05	12/06/23 10:17	7440-09-7	
Sodium	**<115**	ug/L	500	115	1	11/30/23 10:05	12/06/23 10:17	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		11/22/23 21:01		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**28.0**	mg/L	5.0	5.0	1		11/20/23 13:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		12/12/23 13:59	16887-00-6	H1
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/12/23 13:59	16984-48-8	H1,L1
Sulfate	**<0.55**	mg/L	1.0	0.55	1		12/12/23 13:59	14808-79-8	H1

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-UG-2 **Lab ID: 60442112002** Collected: 11/13/23 10:53 Received: 11/15/23 05:11 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	**1700**	ug/L	100	6.4	1	11/30/23 10:05	12/06/23 10:25	7440-42-8	
Calcium	**119000**	ug/L	200	26.9	1	11/30/23 10:05	12/06/23 10:25	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	11/30/23 10:05	12/06/23 10:25	7439-89-6	
Magnesium	**24300**	ug/L	50.0	20.1	1	11/30/23 10:05	12/06/23 10:25	7439-95-4	
Manganese	**160**	ug/L	5.0	0.39	1	11/30/23 10:05	12/06/23 10:25	7439-96-5	
Potassium	**3710**	ug/L	500	69.7	1	11/30/23 10:05	12/06/23 10:25	7440-09-7	
Sodium	**14900**	ug/L	500	115	1	11/30/23 10:05	12/06/23 10:25	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**309**	mg/L	20.0	10.5	1		11/22/23 21:17		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**483**	mg/L	10.0	10.0	1		11/20/23 13:15		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**12.9**	mg/L	1.0	0.53	1		12/12/23 16:04	16887-00-6	H1
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/12/23 16:04	16984-48-8	H1,L1
Sulfate	**0.79J**	mg/L	1.0	0.55	1		12/12/23 16:04	14808-79-8	H1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-BMW-1S **Lab ID: 60441897001** Collected: 11/10/23 09:57 Received: 11/11/23 04:50 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	**57.9J**	ug/L	100	6.4	1	11/28/23 12:31	11/29/23 10:15	7440-42-8	
Calcium	**136000**	ug/L	200	26.9	1	11/28/23 12:31	11/29/23 10:15	7440-70-2	
Iron	**57.0**	ug/L	50.0	9.1	1	11/28/23 12:31	11/29/23 10:15	7439-89-6	
Magnesium	**26600**	ug/L	50.0	20.1	1	11/28/23 12:31	11/29/23 10:15	7439-95-4	
Manganese	**489**	ug/L	5.0	0.39	1	11/28/23 12:31	11/29/23 10:15	7439-96-5	
Potassium	**633**	ug/L	500	69.7	1	11/28/23 12:31	11/29/23 10:15	7440-09-7	
Sodium	**5970**	ug/L	500	115	1	11/28/23 12:31	11/29/23 10:15	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**427**	mg/L	20.0	10.5	1		11/21/23 20:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**475**	mg/L	10.0	10.0	1		11/17/23 14:43		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**7.2**	mg/L	1.0	0.53	1		12/07/23 13:26	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/07/23 13:26	16984-48-8	L1
Sulfate	**46.9**	mg/L	5.0	2.8	5		12/08/23 21:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD
Pace Project No.: 60442105

Sample: S-BMW-3S **Lab ID: 60441897002** Collected: 11/10/23 09:18 Received: 11/11/23 04:50 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	**58.9J**	ug/L	100	6.4	1	11/28/23 12:31	11/29/23 10:17	7440-42-8	
Calcium	**114000**	ug/L	200	26.9	1	11/28/23 12:31	11/29/23 10:17	7440-70-2	
Iron	**58.0**	ug/L	50.0	9.1	1	11/28/23 12:31	11/29/23 10:17	7439-89-6	
Magnesium	**20700**	ug/L	50.0	20.1	1	11/28/23 12:31	11/29/23 10:17	7439-95-4	
Manganese	**211**	ug/L	5.0	0.39	1	11/28/23 12:31	11/29/23 10:17	7439-96-5	
Potassium	**717**	ug/L	500	69.7	1	11/28/23 12:31	11/29/23 10:17	7440-09-7	
Sodium	**5960**	ug/L	500	115	1	11/28/23 12:31	11/29/23 10:17	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**357**	mg/L	20.0	10.5	1		11/21/23 20:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**398**	mg/L	10.0	10.0	1		11/17/23 14:43		1e
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**13.4**	mg/L	1.0	0.53	1		12/07/23 13:49	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/07/23 13:49	16984-48-8	L1
Sulfate	**12.3**	mg/L	1.0	0.55	1		12/07/23 13:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 874935
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: 60441897001, 60441897002

METHOD BLANK: 3465241 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	11/29/23 10:04	
Calcium	ug/L	<26.9	200	26.9	11/29/23 10:04	
Iron	ug/L	<9.1	50.0	9.1	11/29/23 10:04	
Magnesium	ug/L	<20.1	50.0	20.1	11/29/23 10:04	
Manganese	ug/L	<0.39	5.0	0.39	11/29/23 10:04	
Potassium	ug/L	<69.7	500	69.7	11/29/23 10:04	
Sodium	ug/L	<115	500	115	11/29/23 10:04	

LABORATORY CONTROL SAMPLE: 3465242

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	935	94	85-115	
Calcium	ug/L	10000	9590	96	85-115	
Iron	ug/L	10000	9850	98	85-115	
Magnesium	ug/L	10000	9550	95	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	9440	94	85-115	
Sodium	ug/L	10000	9780	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3465243 3465244

Parameter	Units	60442540001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	420	1000	1000	1370	1320	95	90	70-130	4	20	
Calcium	ug/L	33500	10000	10000	43100	41500	96	79	70-130	4	20	
Iron	ug/L	992	10000	10000	10800	10400	98	94	70-130	4	20	
Magnesium	ug/L	10500	10000	10000	20000	19300	95	88	70-130	4	20	
Manganese	ug/L	395	1000	1000	1360	1310	96	92	70-130	3	20	
Potassium	ug/L	18900	10000	10000	30300	29400	115	105	70-130	3	20	
Sodium	ug/L	1780000	10000	10000	1810000	1730000	259	-572	70-130	5	20	E,M1

MATRIX SPIKE SAMPLE: 3465245

Parameter	Units	60442296002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	290	1000	1240	95	70-130	
Calcium	ug/L	104000	10000	112000	83	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

MATRIX SPIKE SAMPLE: 3465245

Parameter	Units	60442296002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	270	10000	10100	98	70-130	
Magnesium	ug/L	52900	10000	62400	95	70-130	
Manganese	ug/L	73.5	1000	1070	100	70-130	
Potassium	ug/L	86000	10000	94800	88	70-130	
Sodium	ug/L	212000	10000	219000	67	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 875218
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: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

METHOD BLANK: 3466217 Matrix: Water
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/06/23 09:53	
Calcium	ug/L	<26.9	200	26.9	12/06/23 09:53	
Iron	ug/L	<9.1	50.0	9.1	12/06/23 09:53	
Magnesium	ug/L	<20.1	50.0	20.1	12/06/23 09:53	
Manganese	ug/L	<0.39	5.0	0.39	12/06/23 09:53	
Potassium	ug/L	<69.7	500	69.7	12/06/23 09:53	
Sodium	ug/L	<115	500	115	12/06/23 09:53	

LABORATORY CONTROL SAMPLE: 3466218

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	945	94	85-115	
Calcium	ug/L	10000	9670	97	85-115	
Iron	ug/L	10000	9780	98	85-115	
Magnesium	ug/L	10000	9480	95	85-115	
Manganese	ug/L	1000	1020	102	85-115	
Potassium	ug/L	10000	9300	93	85-115	
Sodium	ug/L	10000	9990	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3466219 3466220

Parameter	Units	60442105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	93.7J	1000	1000	1040	1040	95	94	70-130	0	20	
Calcium	ug/L	117000	10000	10000	120000	122000	30	45	70-130	1	20	M1
Iron	ug/L	<9.1	10000	10000	9720	9850	97	98	70-130	1	20	
Magnesium	ug/L	30400	10000	10000	38400	38700	80	83	70-130	1	20	
Manganese	ug/L	695	1000	1000	1660	1690	96	99	70-130	2	20	
Potassium	ug/L	5880	10000	10000	15300	15400	95	95	70-130	0	20	
Sodium	ug/L	4970	10000	10000	14900	15000	99	100	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3466221 3466222

Parameter	Units	60442112001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	165	1000	1000	1160	1110	99	94	70-130	5	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3466221 3466222

Parameter	Units	60442112001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	157000	10000	10000	165000	155000	81	-24	70-130	7	20	M1
Iron	ug/L	11.0J	10000	10000	10200	9820	102	98	70-130	4	20	
Magnesium	ug/L	36400	10000	10000	46200	43200	99	68	70-130	7	20	M1
Manganese	ug/L	355	1000	1000	1400	1340	104	98	70-130	5	20	
Potassium	ug/L	10700	10000	10000	20900	19900	103	93	70-130	5	20	
Sodium	ug/L	43300	10000	10000	53600	50600	103	72	70-130	6	20	

MATRIX SPIKE SAMPLE: 3466223

Parameter	Units	60442112004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	82.0J	1000	1050	97	70-130	
Calcium	ug/L	133000	10000	137000	47	70-130	M1
Iron	ug/L	278	10000	10400	101	70-130	
Magnesium	ug/L	27800	10000	36500	87	70-130	
Manganese	ug/L	484	1000	1510	102	70-130	
Potassium	ug/L	6670	10000	16500	98	70-130	
Sodium	ug/L	4300	10000	14600	103	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 874278
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60441897001, 60441897002

METHOD BLANK: 3462786 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/21/23 19:16	

LABORATORY CONTROL SAMPLE: 3462787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	481	96	90-110	

SAMPLE DUPLICATE: 3462788

Parameter	Units	60441589019 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	475	483	2	10	

SAMPLE DUPLICATE: 3462789

Parameter	Units	60441862007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	232	240	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 874537
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

METHOD BLANK: 3463835 Matrix: Water
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/22/23 19:52	

LABORATORY CONTROL SAMPLE: 3463836

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	487	97	90-110	

SAMPLE DUPLICATE: 3463837

Parameter	Units	60442101001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	576	573	0	10	

SAMPLE DUPLICATE: 3463838

Parameter	Units	60442105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	363	363	0	10	

SAMPLE DUPLICATE: 3463839

Parameter	Units	60442112001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	428	432	1	10	

SAMPLE DUPLICATE: 3463840

Parameter	Units	60441897015 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	470	471	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 873904
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60441897001, 60441897002

METHOD BLANK: 3461231 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/17/23 14:43	

LABORATORY CONTROL SAMPLE: 3461232

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	998	100	80-120	

SAMPLE DUPLICATE: 3461233

Parameter	Units	60441897001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	475	462	3	10	

SAMPLE DUPLICATE: 3461753

Parameter	Units	60441898004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	345	366	6	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 874090
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

METHOD BLANK: 3462073 Matrix: Water
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/20/23 13:12	

LABORATORY CONTROL SAMPLE: 3462074

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	986	99	80-120	

SAMPLE DUPLICATE: 3462244

Parameter	Units	60442101001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	751	727	3	10	

SAMPLE DUPLICATE: 3462245

Parameter	Units	60442105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	451	471	4	10	

SAMPLE DUPLICATE: 3462246

Parameter	Units	60442112001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	672	643	4	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 875885
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: 60441897001, 60441897002

METHOD BLANK: 3469019 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/07/23 13:03	
Fluoride	mg/L	<0.12	0.20	0.12	12/07/23 13:03	
Sulfate	mg/L	<0.55	1.0	0.55	12/07/23 13:03	

METHOD BLANK: 3471852 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/08/23 21:31	
Fluoride	mg/L	<0.12	0.20	0.12	12/08/23 21:31	
Sulfate	mg/L	<0.55	1.0	0.55	12/08/23 21:31	

LABORATORY CONTROL SAMPLE: 3469020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	90	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	4.5	91	90-110	

LABORATORY CONTROL SAMPLE: 3471853

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	90-110	
Fluoride	mg/L	2.5	2.8	113	90-110	L1
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3469021 3469022

Parameter	Units	60441898004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	23.8	25	25	48.4	48.2	99	98	80-120	0	15	H1
Fluoride	mg/L	0.15J	2.5	2.5	3.1	3.2	119	122	80-120	2	15	M1
Sulfate	mg/L	1.9	5	5	6.9	7.2	100	106	80-120	4	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 SCPD
Pace Project No.: 60442105

SAMPLE DUPLICATE: 3469023

Parameter	Units	60441898004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	23.8	23.0	3	15	H1
Fluoride	mg/L	0.15J	0.15J		15	
Sulfate	mg/L	1.9	1.7	9	15	

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REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

QC Batch: 876463
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: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

METHOD BLANK: 3471507 Matrix: Water
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/11/23 21:27	
Fluoride	mg/L	<0.12	0.20	0.12	12/11/23 21:27	
Sulfate	mg/L	<0.55	1.0	0.55	12/11/23 21:27	

METHOD BLANK: 3474186 Matrix: Water
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/13/23 13:43	
Fluoride	mg/L	<0.12	0.20	0.12	12/13/23 13:43	
Sulfate	mg/L	<0.55	1.0	0.55	12/13/23 13:43	

METHOD BLANK: 3474189 Matrix: Water
Associated Lab Samples: 60442105001, 60442105002, 60442105003, 60442105004, 60442105005, 60442112002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/12/23 08:56	
Fluoride	mg/L	<0.12	0.20	0.12	12/12/23 08:56	
Sulfate	mg/L	<0.55	1.0	0.55	12/12/23 08:56	

LABORATORY CONTROL SAMPLE: 3471508

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	2.7	107	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

LABORATORY CONTROL SAMPLE: 3474187

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	2.8	113	90-110	L1
Sulfate	mg/L	5	4.9	98	90-110	

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
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

LABORATORY CONTROL SAMPLE: 3474190

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	2.5	99	90-110	
Sulfate	mg/L	5	5.5	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3471509 3471510

Parameter	Units	60442093002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.8	5	5	11.1	11.1	106	107	80-120	0	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.8	2.8	111	113	80-120	2	15	
Sulfate	mg/L	28.8	50	50	78.7	81.7	100	106	80-120	4	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3471512 3471513

Parameter	Units	60442105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.0	5	5	6.0	6.1	81	82	80-120	1	15	H1
Fluoride	mg/L	<0.12	2.5	2.5	2.8	2.9	113	114	80-120	1	15	H1
Sulfate	mg/L	44.3	50	50	97.9	136	107	183	80-120	33	15	H1,M1, R1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3471515 3471516

Parameter	Units	60442112001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	74.8	50	50	120	122	91	95	80-120	2	15	H1
Fluoride	mg/L	<0.12	2.5	2.5	2.8	2.7	112	107	80-120	5	15	H1
Sulfate	mg/L	52.7	50	50	97.0	102	89	99	80-120	5	15	H1

SAMPLE DUPLICATE: 3471511

Parameter	Units	60442093002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	5.8	5.8	0	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	28.8	27.5	5	15	

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REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCPD
Pace Project No.: 60442105

SAMPLE DUPLICATE: 3471514

Parameter	Units	60442105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	2.0	2.0	2	15	H1
Fluoride	mg/L	<0.12	<0.12		15	H1
Sulfate	mg/L	44.3	44.4	0	15	H1

SAMPLE DUPLICATE: 3471517

Parameter	Units	60442112001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	74.8	71.4	5	15	H1
Fluoride	mg/L	<0.12	<0.12		15	H1
Sulfate	mg/L	52.7	47.7	10	15	H1

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: AMEREN SCPD
Pace Project No.: 60442105

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.

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1e	Achieving a constant weight was not met for this sample.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H1	Analysis conducted outside the EPA method holding time.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPD
Pace Project No.: 60442105

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60441897001	**S-BMW-1S**	EPA 200.7	874935	EPA 200.7	874954
60441897002	**S-BMW-3S**	EPA 200.7	874935	EPA 200.7	874954
60442105001	**S-TMW-4**	EPA 200.7	875218	EPA 200.7	875320
60442105002	**S-TMW-5**	EPA 200.7	875218	EPA 200.7	875320
60442105003	**S-TMW-6**	EPA 200.7	875218	EPA 200.7	875320
60442105004	**S-SCPD-DUP-1**	EPA 200.7	875218	EPA 200.7	875320
60442105005	**S-SCPD-FB-1**	EPA 200.7	875218	EPA 200.7	875320
60442112002	**S-UG-2**	EPA 200.7	875218	EPA 200.7	875320
60441897001	**S-BMW-1S**	SM 2320B	874278		
60441897002	**S-BMW-3S**	SM 2320B	874278		
60442105001	**S-TMW-4**	SM 2320B	874537		
60442105002	**S-TMW-5**	SM 2320B	874537		
60442105003	**S-TMW-6**	SM 2320B	874537		
60442105004	**S-SCPD-DUP-1**	SM 2320B	874537		
60442105005	**S-SCPD-FB-1**	SM 2320B	874537		
60442112002	**S-UG-2**	SM 2320B	874537		
60441897001	**S-BMW-1S**	SM 2540C	873904		
60441897002	**S-BMW-3S**	SM 2540C	873904		
60442105001	**S-TMW-4**	SM 2540C	874090		
60442105002	**S-TMW-5**	SM 2540C	874090		
60442105003	**S-TMW-6**	SM 2540C	874090		
60442105004	**S-SCPD-DUP-1**	SM 2540C	874090		
60442105005	**S-SCPD-FB-1**	SM 2540C	874090		
60442112002	**S-UG-2**	SM 2540C	874090		
60441897001	**S-BMW-1S**	EPA 300.0	875885		
60441897002	**S-BMW-3S**	EPA 300.0	875885		
60442105001	**S-TMW-4**	EPA 300.0	876463		
60442105002	**S-TMW-5**	EPA 300.0	876463		
60442105003	**S-TMW-6**	EPA 300.0	876463		
60442105004	**S-SCPD-DUP-1**	EPA 300.0	876463		
60442105005	**S-SCPD-FB-1**	EPA 300.0	876463		
60442112002	**S-UG-2**	EPA 300.0	876463		

WO# : 60442105

60442105

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sample		
	Revision: 2	Effective Date: 01/12/2022	Issued By: Lenexa

Client Name: Rocksmith

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 ☐

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

Cooler Temperature (°C): As-read 1.0/0.9/1.7 **Corr. Factor** -0.3 **Corrected** 0.8/0.6/1.4

Date and initials of person examining contents: PV 11/15/23

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#:** 61187	☑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: _____

Project Manager Review: _____ Date: _____

Pace® Location Requested (City/State):
Pace Analytical Kansas
9608 Loiret Blvd., Lenexa, KS 66219

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here

Scan QR Code for instructions

600442105

Company Name:	Rocksmith Geoengineering, LLC.	Contact/Report To:	Mark Haddock
Street Address:	2320 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark.haddock@rocksmithgeo.com
		Cc E-Mail:	Jeff Ingram, jeff.ingram@rocksmithgeo.com
Customer Project #:		Invoice To:	Mark Haddock
Project Name:	AMEREN SCPD	Invoice E-Mail:	mark.haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET

County / State origin of sample(s): Missouri

Data Deliverables:
[ ] Level II [ ] Level III [ ] Level IV
[ ] EQUIS
[ ] Other_____

Regulatory Program (DW, RCRA, etc.) as applicable:

Rush (Pre-approval required):
[ ] 2 Day [ ] 3 day [ ] 5 day [ ] Other_____

Date Results Requested:

DW PWSID # or WW Permit # as applicable:

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Other (OT), Surface Water (SW),Sediment (SED), Sludge (SL), Caulk

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res. CL2	Number & Type of Containers Plastic	Number & Type of Containers Glass	Chloride/Fluoride/Sulfate	Alkalinity	TDS	App III and Cat/An Metals (200.7)*	Sample Comment
S-UG-2	WT	G	11-13-23	1053				2		✓	✓	✓	✓	log under SCPA-CA
S-TMW-4	WT	G	11-13-23	1348				2		✓	✓	✓	✓	
S-TMW-5	WT	G	11-13-23	1438				2		✓	✓	✓	✓	
S-TMW-6	WT	G	11-13-23	1527				2		✓	✓	✓	✓	
S-SCPD-DUP-1	WT	G	11-13-23	—				2		✓	✓	✓	✓	
S-SCPD-FB-1	WT	G	11-13-23	1427				2		✓	✓	✓	✓	
S-SCPD-MS-1	WT	G	11-13-23	1348				2		✓	✓	✓	✓	Collected @ S-TMW-4
S-SCPD-MSD-1	WT	G	11-13-23	1348				2		✓	✓	✓	✓	1
S-BMW-1S	WT													log under SCPA-CA
S-BMW-3S	WT													log under SCPA-CA

Lab Use Only
Proj. Mgr: Jamie Church
AcctNum / Client ID:
Table #:
Profile / Template: 15856, Line 2
Prelog / Bottle Ord. ID: EZ 3013056

Preservation non-conformance identified for sample.

Customer Remarks / Special Conditions / Possible Hazards:
* - App III and Cat/An Metals* - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B

Collected By:
Printed Name: Grant Morey
Signature:

Additional Instructions from Pace®:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)
3	T298	-0.3	1.0/0.9/1.7	0.8/0.6/1.4

Relinquished by/Company: (Signature)	Date/Time: 11-14-23/1430	Received by/Company: (Signature)	Date/Time: 11/15/23 05:11	Tracking Number:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Delivered by: [ ] In-Person [ ] Courier
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	[ ] FedEX [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

Client: Rocksmith Geoeng Profile #

Site: Ameren SCPD Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1	WT																		1				1							Do not log.		
2	↓																		3				3									
3																			1				1									
4																			1				1									
5																			1				1									
6	↓																		1				1									
7																																
8																																
9																																
10																																
11																																
12																																

Container Codes

Glass			
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass
		AG5U	100mL unpres amber glass

Plastic	
BP1C	1L NAOH plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn Acetate
BP2C	500mL NAOH plastic
BP2N	500mL HNO3 plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Acetate
BP3C	250mL NaOH plastic
BP3F	250mL HNO3 plastic - field filtered
BP3N	250mL HNO3 plastic
BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Acetate
BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic
WPDU	16oz unpresserved plstic

Misc.	
I	Wipe/Swab
SP5T	120mL Coliform Na Thiosulfate
ZPLC	Ziploc Bag
AF	Air Filter
C	Air Cassettes
R	Terracore Kit
U	Summa Can

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

Work Order Number: 60442105

Pace® Lab Requested (City/State):
Pace Analytical Kansas
9608 Loiret Blvd., Lenexa, KS 66219

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here

Scan QR Code for instructions

Company Name:	Rocksmith Geoengineering, LLC.	Contact/Report To:	Mark Haddock
Street Address:	2320 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark.haddock@rocksmithgeo.com
		Cc E-Mail:	Jeff Ingram, jeff.ingram@rocksmithgeo.com
Customer Project #:		Invoice To:	Mark Haddock
Project Name:	AMEREN SCPD ✓	Invoice E-Mail:	mark.haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET

County / State origin of sample(s): Missouri

Data Deliverables:
[ ] Level II [ ] Level III [ ] Level IV
[ ] EQUIS
[ ] Other_____

Regulatory Program (DW, RCRA, etc.) as applicable:

Rush (Pre-approval required):
[ ] 2 Day [ ] 3 day [ ] 5 day [ ] Other_____
Date Results Requested:

DW PWSID # or WW Permit # as applicable:

Field Filtered (if applicable): [ ] Yes [ ] No
Analysis:

* Matrix Codes (insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Other (OT), Surface Water (SW),Sediment (SED), Sludge (SL), Caulk

Specify Container Size **
Identify Container Preservative Type***
Analysis Requested

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only
Proj. Mgr: Jamie Church
AcctNum / Client ID:
Table #:
Profile / Template: 15856, Line 2
Prelog / Bottle Ord. ID: EZ 3013056

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res. Cl2	Number & Type of Containers: Plastic	Number & Type of Containers: Glass	Chloride/Fluoride/Sulfate	Alkalinity	TDS	App III and Cat/An Metals (200.7)*	Sample Comment	Preservation non-conformance identified for sample.
S-UG-2	WT													log under SCPA-CA	
S-TMW-4	WT														
S-TMW-5	WT														
S-TMW-6	WT														
S-SCPD-DUP-1	WT														
S-SCPD-FB-1	WT														
S-SCPD-MS-1	WT														
S-SCPD-MSD-1	WT														
S-BMW-1S	WT	G	11/10/23	0957	—	—		4	-	✓	✓	✓	✓	log under SCPA-CA	
S-BMW-3S	WT	G	11/20/23	0916	—	—		4	-	✓	✓	✓	✓	log under SCPA-CA	

Customer Remarks / Special Conditions / Possible Hazards:
* - App III and Cat/An Metals* - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B -

Collected By:
Printed Name: Grant Muncy
Signature:

Additional Instructions from Pace®:

Coolers: Thermometer ID: Correction Factor (°C): Obs. Temp. (°C) Corrected Temp. (°C)

Relinquished by/Company: (Signature) Rocksmith	Date/Time: 11-10-23/1550	Received by/Company: (Signature)	Date/Time:	Tracking Number:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Delivered by: [ ] In- Person [ ] Courier
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	[ ] FedEx [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

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Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace® Terms and Conditions found at https://www.pacelabs.com/resource-library/resource/pace-terms-and-conditions/

Memorandum

January 21, 2024

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23009
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	Grant.Morey@Rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCPD – Data Package 60442105**		

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 analyzed outside of hold time, the sample result was qualified as an estimate (J for detects, UJ for non-detects).
- When a compound was detected in a sample result between the Method Detection Limit (MDL) and Practical Quantification Limit (PQL), the results were recorded at the detection value and qualified as estimates (J).
- When a duplicate criterion was not met, the associated sample result was qualified as an estimate (J for detects, UJ for non-detects).
- When a matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J, J+ for estimates based high, and J- for estimates based low).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPD
Project Number: 23009
Reviewer: G. Morey
Validation Date: 1/21/2024

Laboratory: Pace Analytical
SDG #: 60442105
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions);
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-TMW-4, S-TMW-5, S-TMW-6, S-SCPD-DUP-1, S-SCPD-FB-1, S-UG-2, 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			11/10/2023 - 11/13/2023
b) Sampling team indicated?	x			GTM/JSI
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, Spec 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	No lab narrative.

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		See Notes
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		

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)?	☒	☐	☐	See Notes
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?	☐	☒	☐	See Notes

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				S-SCPD-DUP-1 @ S-TMW-6
	☒	☐	☐	See Notes
b) Were field dup. precision criteria met (note RPD)?	☐	☒	☐	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☒	☐	☐	See Notes
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?	☐	☒	☐	See Notes

Comments/Notes:

General:

Chloride, fluoride, and sulfate analyzed outside of hold time controls in several samples, results qualified as estimates.

Sulfate diluted in some samples, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Field Blanks:

S-SCPD-FB-1 @ S-TMW-5: TDS (28.0). Result > RL and 10x blank, no qualification necessary.

Laboratory Control Samples:

3471853: LCS recovery high for fluoride, associated with samples -001 and -002. Results are non-detects, no qualification necessary.

3474187: LCS recovery high for fluoride, associated with samples -5001 through -5005 and -2002. Results are non-detects, no qualification necessary.

Duplicates:

S-SCPD-DUP-1 @ S-TMW-6: Field duplicate RPD exceeds control limits for chloride, results qualified as estimates.

Lab duplicate Max RPD: 10%: Alkalinity, TDS; 15%: Chloride, Fluoride, Sulfate

MS/MSD:

3465243/3465244: MS recovery low, MSD recovery high for sodium. Associated with unrelated sample, no qualification necessary.

3465245: MS recovery low, associated with unrelated sample, no qualification necessary.

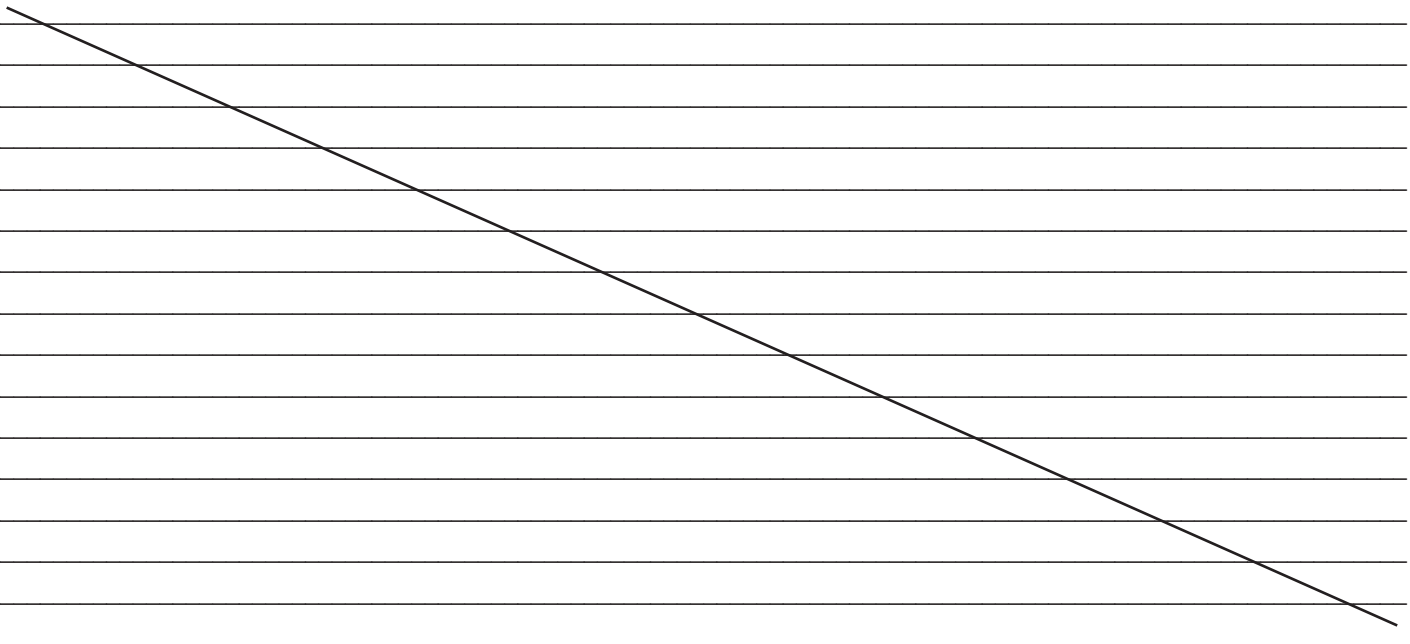
3466219/3466220: MS/MSD recoveries low for calcium, associated with sample -5001. Result qualified as estimate.

3466221/3466222: MSD recoveries low for calcium and magnesium, MS recoveries and RPDs within control limits, no qualification necessary.

3466223: MS recovery low for calcium, associated with unrelated sample, no qualification necessary.

3469021/3469022: MSD recovery high for fluoride, MS recovery and RPD within control limits, no qualification necessary.

3471512/3471513: MSD recovery high and RPD outside of control limits for sulfate, associated with sample -5001, result qualified as estimate.



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-TMW-4	Chloride	2.0	J	Analyzed outside of hold time controls
"	Fluoride	0.12	UJ	"
"	Sulfate	44.3	J	"
S-TMW-5	Chloride	1.4	J	"
"	Fluoride	0.12	UJ	"
"	Sulfate	50.0	J	"
S-TMW-6	Chloride	2.0	J	"
"	Fluoride	0.12	UJ	"
"	Sulfate	36.0	J	"
S-SCPD-DUP-1	Chloride	2.4	J	"
"	Fluoride	0.12	UJ	"
"	Sulfate	36.0	J	"
S-SCPD-FB-1	Chloride	0.53	UJ	"
"	Fluoride	0.12	UJ	"
"	Sulfate	0.55	UJ	"
S-UG-2	Chloride	12.9	J	"
"	Fluoride	0.12	UJ	"
"	Sulfate	0.79	J	"
S-SCPD-DUP-1	Chloride	2.4	J	Field DUP RPD exceeds control limit
S-TMW-6	Chloride	2.0	J	"
S-TMW-4	Calcium	117,000	J-	MS/MSD recoveries low
S-TMW-4	Sulfate	44.3	J	MSD recovery high, RPD outside of control limit

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 01/21/2024

Appendix B

Alternative Source Demonstration – May 2023 Sampling Event

REPORT

SCPD – Alternative Source Demonstration

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

December 18, 2023

Project Number: 23009

Submitted to:

Ameren Missouri
1901 Chouteau Ave
St. Louis, MO 63103

Submitted by:

Rocksmith Geoengineering, LLC
2320 Creve Coeur Mill Rd
Maryland Heights, MO 63043

Table of Contents

TABLES

FIGURES

1.0 CERTIFICATION STATEMENT

This *SCPD – 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 Rocksmith Geoengineering, LLC.

I hereby certify that this *SCPD – 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).

Rocksmith Geoengineering, LLC.,

_____

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

Principal Engineer, Senior Partner

2.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this SCPD – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for one Statistically Significant Increase (SSI) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPD Cell 2. 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 SCPD. 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 SCPD 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 that lie unconformably on top of bedrock. These alluvial deposits range from approximately 100 to 130 feet in thickness 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 – SCPD

UWL Cell 2 is referred to by Ameren as the SCPD, or "Gypsum Pond" Cell 2. The SCPD is approximately 36 acres in size and is located south of the generating plant on the south side of Highway 94 (Figure 1). The CCR Unit, which began operation on December 14, 2022, manages CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD).

The WFGD process occurs after the removal of slag and fly ash. A crushed limestone ($CaCO_3$) mix is introduced into the boiler flue gas flow. The limestone reacts with sulfur dioxide (SO_2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate ($CaSO_4 * 2H_2O$)). The resultant gypsum material was formerly wet sluiced from the plant across the highway to the SCPC, and has been wet sluiced to SCPD since December 14, 2022. Once there, the gypsum is dewatered by gravity, with the sluice conveying recycled water 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 SCPD cell is bounded immediately on the west by the SCPC surface Impoundment (UWL Cell 1), northeast by the SCL4A (UWL Cell 4a) landfill cell, the north by the UWL recycle pond, and south/southeast by low lying agricultural floodplain. The perimeter berm surrounding the SCPD is built up to an elevation of 446 feet above mean sea level (MSL), which is approximately 5 feet above 100-year flood elevation of 441.2 feet MSL and about 12 to 18 feet above the surrounding low-lying farmland. This berm elevation is equivalent to the adjacent SCPC, SCL4A, and Recycle Pond areas. Additionally, the SCPD is lined with a bottom composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1×10^{-7} centimeters per second (cm/sec) overlain by a 60-mil flexible high-density polyethylene (HDPE) geomembrane liner. This liner system has a base elevation (top of liner/base of CCR) of approximately 432 feet MSL at its lowest point.

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 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. Placement of WFGD materials in the SCPD started on December 14, 2022.

3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, prior to the initial receipt of CCR on December 14, 2022 the following were completed: (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 baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPD consists of six monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. One monitoring well (UG-2) was installed by Gredell Engineering Resources, Inc. (Gredell) in December 2007 as a part of the state UWL state monitoring program. This monitoring well is used in both the SCPC and SCPD groundwater monitoring well networks. The background monitoring wells (BMW-1S and BMW-3S) were installed by Golder Associates Inc. (Golder) in 2016 for CCR Rule groundwater monitoring purposes. Three monitoring wells (TMW-4, TMW-5, and TMW-6) were installed in March 2022 to the south and southeast of the SCPD by WSP USA, Inc. (WSP) specifically for CCR groundwater monitoring of the SCPD. More information on the design and installation of the monitoring wells is provided in the SCPD GMP (WSP, 2022) and the SCPD 2022 Annual Report (WSP, 2023).

Between May 2016 and June 2017, eight baseline sampling events were completed for the existing monitoring wells used to monitor the SCPD (UG-2, BMW-1S, and BMW-3S). Eight baseline sampling events were also collected between March and October of 2022 for TMW-4, TMW-5, and TMW-6. After baseline sampling, the first detection monitoring event was completed in May 2023. The following Appendix III constituents were analyzed during detection monitoring:

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

In January 2023, background results from the eight baseline sampling events were used to calculate statistical upper prediction limits (UPLs). These UPLs were then compared to the detection monitoring results from the May 2023 sampling event. If results from the detection monitoring event were higher than the calculated UPL, it was considered to be an initial exceedance, and a verification sample was then collected and tested in accordance with the SCPD Statistical Analysis Plan (SAP). In May 2023, one initial exceedance was identified for boron at UG-2. Verification sampling in July 2023 confirmed the initial exceedance. Results from this sampling event are provided in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Monitoring well UG-2 is screened in the upper portion of the alluvial aquifer, just below the average seasonal low for groundwater. As shown in **Figure 1**, UG-2 is located north of the SCPD, south of the generating plant, highway 94, and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

Based on Rocksmith'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 in some areas around the SCPD contains low-level pre-existing impacts from CCR that pre-date SCPD construction and operation. As a result of these pre-existing impacts, the SCPD 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 May 2023 SSI is provided in **Table 2.**

Table 2: Review of Statistically Significant Increase

Constituent	Well ID	Current UPL	Range of Values Prior to May 2023 Sampling Event (CCR Rule and State UWL Sampling)	May 2023 Result	July 2023 Result
Boron (µg/L)	UG-2	264.7	ND (<100) – 322 (with outliers between 491 - 2,180)	458	291

Notes:
1) mg/L – milligrams per liter.
2) µg/L – micrograms per liter.
3) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.
4) ND – Non-Detect.
5) Several outliers were identified at UG-2 prior to calculating the UPL for UG-2. These include eight high results collected between May 2013 and February 2015 inferred to be associated with the construction of the SCL4A. The range of these outliers is between 491 and 2,180 µg/L.

5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSI is not the result of a release from the SCPD and that the SSI originates from an alternative source. The following bullets summarize the different lines of evidence that support this ASD:

- Construction documents for the SCPD indicating the 60-mil high-density polyethelyne (HDPE) geomembrane liner and a 2-foot thick clay barrier, verified byquality assurance testing during construction.
- Lack of elevated key FGD Indicators (sulfate, calcium, chloride, and sodium) in monitoring wells with SSIs.
- Southward groundwater flow from the upgradient SCPA CCR Unit, currently in Corrective Action towards the SCPD.
- Documentation of pre-existing, low-level concentrations of CCR indicators in groundwater that pre-date the SCPD operation, especially on the northern side of the SCPD.
- Comparison of concentrations in nearby monitoring wells prior to the placement of CCR in the SCPD.

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	• Boron

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
	the burning of finely ground coal in the boiler.	• 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.

As described above, the SCPD has historically received FGD type wastes that are managed at the SEC.

5.2 Evaluation of the Statistically Significant Boron Exceedance at UG-2

5.2.1 Key Indicators for FGD Type Impacts

As displayed in **Table 3**, boron can be a key indicator of FGD impacts because it is typically present in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). However, boron is typically only a key indicator unwashed gypsum, as concentrations for washed gypsum may be too low to be useful.

As a part of the EPRI 2012 report, EPRI investigated what constituents would be the most beneficial indicator parameters for FGD gypsum impacts. **Table 4** (in text) provides a further evaluation of the key FGD indicator parameters as provided in the EPRI 2012 report.

Table 4 – Key Indicators for FGD Impacts

Constituent	Advantages and Caveats
Sulfate	High concentrations expected in both washed and unwashed FGD gypsum (EPRI, 2011a). Commonly analyzed. Very mobile in all hydrogeologic environments. Less useful in strongly reducing environments where sulfate can be reduced to hydrogen sulfide gas.
Fluoride	Mobile and non-reactive in common hydrogeologic environments. Assure that leachate concentration is higher than background, particularly for washed gypsum.
Calcium	High concentrations expected in both washed and unwashed FGD gypsum (EPRI, 2011a). Understanding of carbonate chemistry necessary to assure that precipitation or dissolution does not affect downgradient concentrations.
Boron	Mobile indicator constituent for unwashed FGD gypsum. Concentrations for washed gypsum may be too low to be useful (EPRI, 2011a).

Constituent	Advantages and Caveats
Bromide	Mobile indicator constituent for unwashed FGD gypsum, especially if Br-PAC or CaBr used for mercury controls. Concentrations for washed gypsum may be too low to be useful (EPRI, 2011a).
Chloride	Mobile indicator constituent for unwashed FGD gypsum. Concentrations may be very high if transport water is recirculated. Concentrations for washed gypsum may be too low to be useful (EPRI, 2011a).

Notes:

1) Table from EPRI 2012, Table 3-3.

As discussed in Section 3.2, the WFGD process occurs after the removal of slag and fly ash. A crushed limestone (CaCO3) mix is introduced into the boiler flue gas flow. The limestone reacts with sulfur dioxide (SO2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate (CaSO4 * 2H2O)). The resultant gypsum material is wet sluiced from the plant across the highway to the SCPD. Once there, the gypsum is dewatered by gravity with the sluice conveying recycled water 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). Therefore, based on the handling of FGD materials at the SCPD, and discussions from the EPRI 2012 report, it would be expected that sulfate, calcium, sodium and chloride concentrations would increase if there were groundwater impacts caused by the SCPD. Impacts to boron, calcium, and fluoride concentrations are possible, although these constituents are expected to be secondary and not as distinct.

5.2.2 Concentrations of FGD Indicators at UG-2

Figures 2-7 display time series plots of the FGD indicators (boron, sulfate, fluoride, calcium, chloride, sodium) at UG-2 compared to their respective UPLs, initial placement of FGD materials at the SCPC (7/30/2010), construction of the adjacent SCL4A (8/16/2014), and commencement of closure of the SCPC/placement of CCR in the SCPD (12/14/2022). **Table 5** below provides a summary of for each FGD indicator constituent, including the range of sample results prior to the placement of FGD materials at the SCPC, a UPL calculated from the constituents prior to the placement of FGD materials, the current UPL and most recent results.

Table 5: Summary of FGD Indicator Parameters at UG-2

Constituent	Pre-FGD Placement into the SCPC Sampling Concentration Range (Prior to 7/30/2010)	Calculated UPL Based on Pre-FGD Placement in the SCPC	Range of Values Prior FGD materials in SCPD (CCR Rule and State UWL Sampling)	Current UPL	May 2023 Result	July 2023 Result
Boron (µg/L)	148 – 322	397.1	ND (<100) – 2,180	264.7	458	291
Sulfate (mg/)	53 – 76	84.65	17.7 – 122	95.94	51.8	NS
Fluoride (mg/L)	0.21 – 0.31	0.3371	ND (<0.12) – 0.34	0.3257	ND (<0.12)	NS
Calcium (µg/L)	122,000 – 164,000	175,535	80,500 – 164,000	146,120	115,000	NS
Chloride (mg/)	22.0 – 113	138.4	2.3 – 113	98.49	37.2	NS
Sodium (mg/L)	29.6 – 88.5	108.1	5.42 – 88.5	NA	26.0	NS

Notes:

1) NA – Not Applicable. No limit calculated for sodium as it is not a CCR Rule Appendix III or IV parameter.
2) NS – Not Sampled.
3) ND – Non-detect. Not detected above the Method Detection Limit (MDL).
4) mg/L – milligrams per liter.
5) µg/L – micrograms per liter.

As displayed on **Figures 2 - 7** and summarized in **Table 5**, boron is the only potential FGD indicator parameter present at a level above pre-FGD placement in the SCPC and SCPD values (excluding the high outliers from 2013 – 2015). Concentrations for the other FGD indicator parameters, including the key FGD indicator

parameters of sulfate, calcium, and chloride, are at or below pre-FGD placement levels. The lack of increased sulfate, calcium and chloride concentrations at UG-2 indicates that a source other than the FGD at the SCPD is likely the cause of the SSI at UG-2.

5.2.3 Evaluation for Cause of Elevated Boron Concentrations at UG-2

In 2018, an ASD was completed for the SCPB (fly ash pond) unit to the north/northwest of the SCPD and is available in the 2018 Annual Report for the SCPB on Ameren's publicly available website[1]. In that ASD, pore-water samples were collected from the SCPA and SCPB, and samples were collected in the shallow, intermediate (middle) and deep zones of the alluvial aquifer just outside of the two units. From this ASD, it was determined that CCR impacts found directly outside of the SCPB are from the SCPA and not the SCPB. Impacts were present at their highest concentrations at deeper depths, and groundwater chemistry was similar between the waters of the SCPA and the impacted wells. The SCPB ASD concluded these deeper impacts are from the SCPA because the SCPA is an unlined CCR unit that extends approximately 70 feet below ground surface, while the SCPB is an HDPE-lined, shallower CCR unit. Therefore, if impacts were from the SCPB, they would be expected to be concentrated in the shallow zone of the alluvial aquifer, whereas impacts from the SCPA would be present across all zones of the alluvial aquifer. Additionally, the SPCA has historically managed bottom ash, fly ash, and boiler slag. As displayed in **Table 2**, boron is a key indicator parameter for impacts from these types of CCR.

In 2018 and 2019, the SCPA moved from Assessment Monitoring into Corrective Action and an investigation into the nature and extent of impacts from the SCPA was completed. As a part of this investigation, samples were collected in the shallow, middle, and deep zones of the alluvial aquifer in multiple locations around the site. One set of piezometers (TP-5) was installed approximately 200 feet to the east of UG-2. In the TP-5 piezometers, boron concentrations ranged from 211-263 µg/L in the shallow zone of the alluvial aquifer; 3,120-3,190 µg/L in the intermediate zone, and 5,460-8,250 µg/L in the deep zone of the alluvial aquifer.

This increase in boron concentration with depth at TP-5 is indicative of impacts from the SCPA rather than the SCPB, SCPC, SCPD or SCL4A because the SCPA is unlined and extends downward 70 feet below ground surface, whereas the SCPB, SCPC, SCPD, and SCL4A are constructed with a liner system with a base elevation above the natural groundwater table. If impacts were from the SCPD, the greatest impacts would be expected in the shallow zone of the alluvial aquifer and would dilute and be expected to decrease with depth. Results from the nature and extent and corrective action investigations further indicate that impacts in the alluvial aquifer at the SEC are from the SCPA and not the other lined units.

For boron impacts to be from the SCPA, UG-2 would need to be hydraulically connected to the SCPA. As displayed on **Figure 1**, UG-2 is located approximately 1,500 feet at its nearest point to the south/southeast of the SCPA. As discussed in the Annual Reports for the SCPC and SCPD, publicly available on Ameren's website, 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, which affect water levels, gradients and flow directions in 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 or south toward the Mississippi and Missouri Rivers, depending on river levels.

River level elevations for the site can be estimated using nearby United State Geological Survey (USGS) gauges. Four nearby gauges are used to calculate the approximate river level of the Mississippi and Missouri Rivers at the SEC and are as follows:

- Grafton Illinois gauge on the Mississippi (USGS #05587450).
- Alton Illinois gauge on the Mississippi River (USGS # 05587500)
- St. Louis Missouri gauge on the Mississippi River (USGS #07010000)

[1] Ameren's publicly available CCR reporting website is available at: (https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports)

- St. Charles Missouri gauge on the Missouri River (USGS #06935965)

A daily water gauge measurement is available for each of these four gauges since at least November 15, 1986. **Figure 8** summarizes the calculated Missouri and Mississippi River data at the plant. The Mississippi River level at the SEC is controlled by a series of locks and dams, with the nearest one being approximately 6 miles downriver at the Mel Price Alton Lock and Dam. This dam controls the river elevation on the Mississippi River near the SEC, minimizing impacts from flooding and drought and giving the Mississippi River a more consistent elevation, as displayed on **Figure 8**. The Missouri River does not have any dams located near the SEC, with the closest dam on the Missouri River being the Gavins Point Dam, located near Yankton, South Dakota. Therefore, the Missouri River is much more susceptible to larger variations in elevation caused by flooding and drought, as displayed in **Figure 8**.

Figure 9 displays the difference between the Mississippi and Missouri River for each day. **Table 6** provides a summary comparison of the Mississippi and Missouri River elevations at the plant. Using the data from January 1, 1987 to November 9, 2023, the Mississippi River was higher than the Missouri River on 7,472 of the 13,462 days (approximately 56% of the time). Since 2021, the hydraulic gradient between the rivers has been higher, with 2023 on pace to be the second highest gradient of southward groundwater flow since 1987 (2006 was the highest). This indicates that UG-2, which is south of the SCPA, is downgradient of the unit and hydraulically connected.

This southward flow of groundwater since 2021 has been confirmed by onsite water level measurements. Prior to each sampling event, water levels are taken at all monitoring wells to determine groundwater flow rates and direction. Potentiometric surface maps generated from these water level measurements display a southward flow of groundwater from the SCPA toward UG-2 since 2021.

Table 6 – Summary of Mississippi and Missouri River Elevations

Year	Days Missouri River has Higher Elevation	Days Mississippi River has Higher Elevation	Average Annual Difference between Mississippi and Missouri Rivers (Results in Feet, number displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation)
1987	243	122	-1.38
1988	82	284	1.48
1989	41	324	2.24
1990	162	203	0.32
1991	92	273	1.34
1992	152	214	-0.20
1993	355	10	-3.05
1994	166	199	-1.17
1995	269	96	-1.62
1996	242	124	-0.98
1997	312	53	-1.70
1998	317	48	-2.21
1999	207	158	-1.15
2000	28	338	2.30
2001	133	232	0.66
2002	63	302	2.18
2003	28	337	3.12
2004	125	241	1.08
2005	88	277	1.91
2006	11	354	4.05
2007	141	224	0.71

Year	Days Missouri River has Higher Elevation	Days Mississippi River has Higher Elevation	Average Annual Difference between Mississippi and Missouri Rivers (Results in Feet, number displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation)
2008	209	157	-0.29
2009	202	163	-0.32
2010	296	69	-1.79
2011	229	136	-1.58
2012	59	307	2.15
2013	51	314	2.46
2014	88	277	1.54
2015	177	188	-0.36
2016	196	170	-0.55
2017	154	211	0.46
2018	232	133	0.03
2019	349	16	-3.08
2020	234	132	-0.72
2021	160	205	0.31
2022	77	288	2.39
2023	20	293	3.14
Total	**5,990**	**7,472**	**Average Difference – 0.32 feet**

6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCPD IMPACTS

Based on the information presented in Section 5.0 above, the SSI reported for boron at UG-2 during the May 2023 monitoring event is not the result of impacts from the SCPD. The SSI for Boron at UG-2 is not caused by the SCPD as there is a lack of increasing key FGD parameters including sulfate, chloride and calcium. Additionally, gradients at the site since FGD materials have been placed in the SCPD have been southward, with the Mississippi River being higher than the Missouri River approximately 94% of the time. The SSI for boron at UG-2 appears to be the result of southward migrating impacts from the upgradient SCPA, which is currently in Corrective Action. As discussed, southward gradients from the SCPA towards UG-2 have been more pronounced since 2021, which may have caused a shift in the boron plume present onsite. Along with these lines of evidence listed above, the SCPD is documented to be constructed with an engineered compacted clay liner overlain by a 60-mil HDPE geomembrane liner system, which was designed and constructed to properly contain CCR and prevent groundwater impacts.

7.0 REFERENCES

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WSP USA Inc., 2022, Initial Detection Monitoring Upper Prediction Limits Using Baseline Sampling Data – Utility Waste Landfill Cell 2 (SCPD), Sioux Energy Center, St. Charles Count, Missouri.

WSP USA Inc., 2023, 2022 Annual Groundwater Monitoring Report, SCPD Surface Impoundment, Sioux Energy Center – St. Charles County, Missouri, USA.

Tables

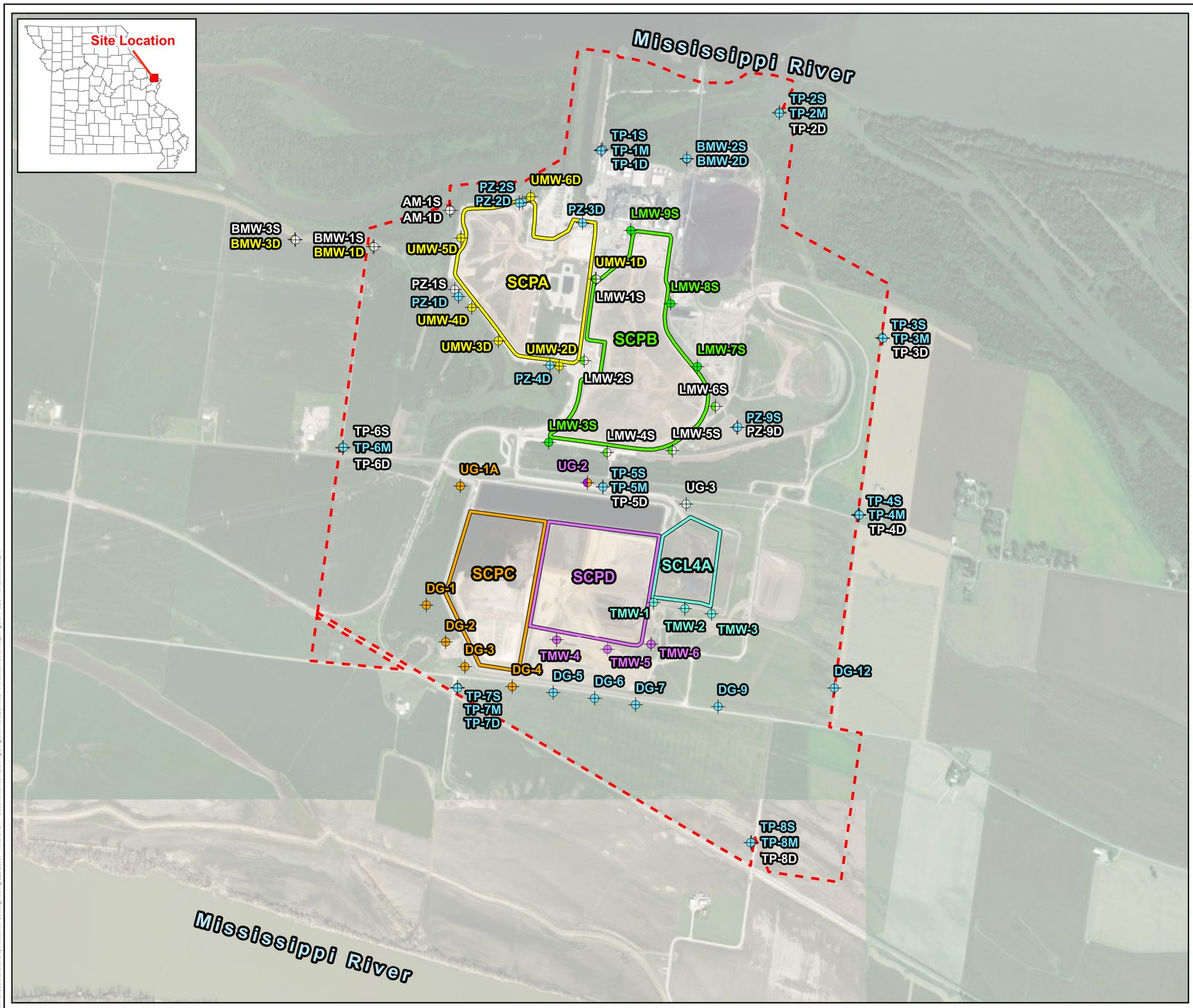
Table 3
May 2023 Detection Monitoring Results
SCPD Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-2	UG-2	Prediction Limit TMW-4	TMW-4	Prediction Limit TMW-5	TMW-5	Prediction Limit TMW-6	TMW-6
May 2023 Detection Monitoring Event											
DATE	NA	5/2/2023	5/2/2023	NA	5/3/2023	NA	5/4/2023	NA	5/4/2023	NA	5/4/2023
pH	SU	6.80	6.95	6.29-7.36	7.09	6.585-7.26	7.00	6.642-7.223	6.93	6.59-7.093	6.93
BORON, TOTAL	µg/L	64.8 J	67.1 J	264.7	458	122.2	99.5 J	116.0	95.7 J	131.8	120
CALCIUM, TOTAL	µg/L	184,000	137,000	146,120	115,000	146,033	130,000	156,060	140,000	179,541	141,000
CHLORIDE, TOTAL	mg/L	13.1	12.6	98.49	37.2	3.216	3.1	2.435	1.9	11.02	2.7
FLUORIDE, TOTAL	mg/L	ND	ND	0.3257	ND	0.48	ND	0.6744	ND	0.37	ND
SULFATE, TOTAL	mg/L	37.7	32.4	95.94	51.8	44.43	38.3	46.12	39.7	51.85	30.7
TOTAL DISSOLVED SOLIDS	mg/L	610	495	758	496	571	331 J	600.6	526	719.8	566 J
July 2023 Verification Sampling Event											
DATE	NA				7/11/2023						
pH	SU										
BORON, TOTAL	µg/L				291						
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L										
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L										
TOTAL DISSOLVED SOLIDS	mg/L										

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. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
7. 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: GTM
Checked By: JSI
Reviewed By: MNH

Figures



TITLE

SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

Legend

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)

Utility Waste Landfill Cells

- SCL4A - Dry CCR Disposal Area
- SCPC - Inactive FGD Surface Impoundment (Closure in Progress)
- SCPD - FGD Surface Impoundment

Monitoring Well Networks

- Corrective Action Monitoring Well
- SCPA Detection and Assessment Monitoring Well
- SCPB and Corrective Action Monitoring Well
- SCPB Detection Monitoring Well
- SCPC Detection Monitoring Well
- SCPD and SCPC Detection Monitoring Well
- SCPD Detection Monitoring Well
- SCL4A and Corrective Action Monitoring Well
- SCL4A Detection Monitoring Well
- Monitoring Well Used for Water Level Elevation Measurements Only

NOTES

1. All boundaries and locations are approximate.
2. FGD - Flue Gas Desulfurization.
3. CCR - Coal Combustion Residuals.

REFERENCES

1. Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.

0 500 1,000 2,000 3,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

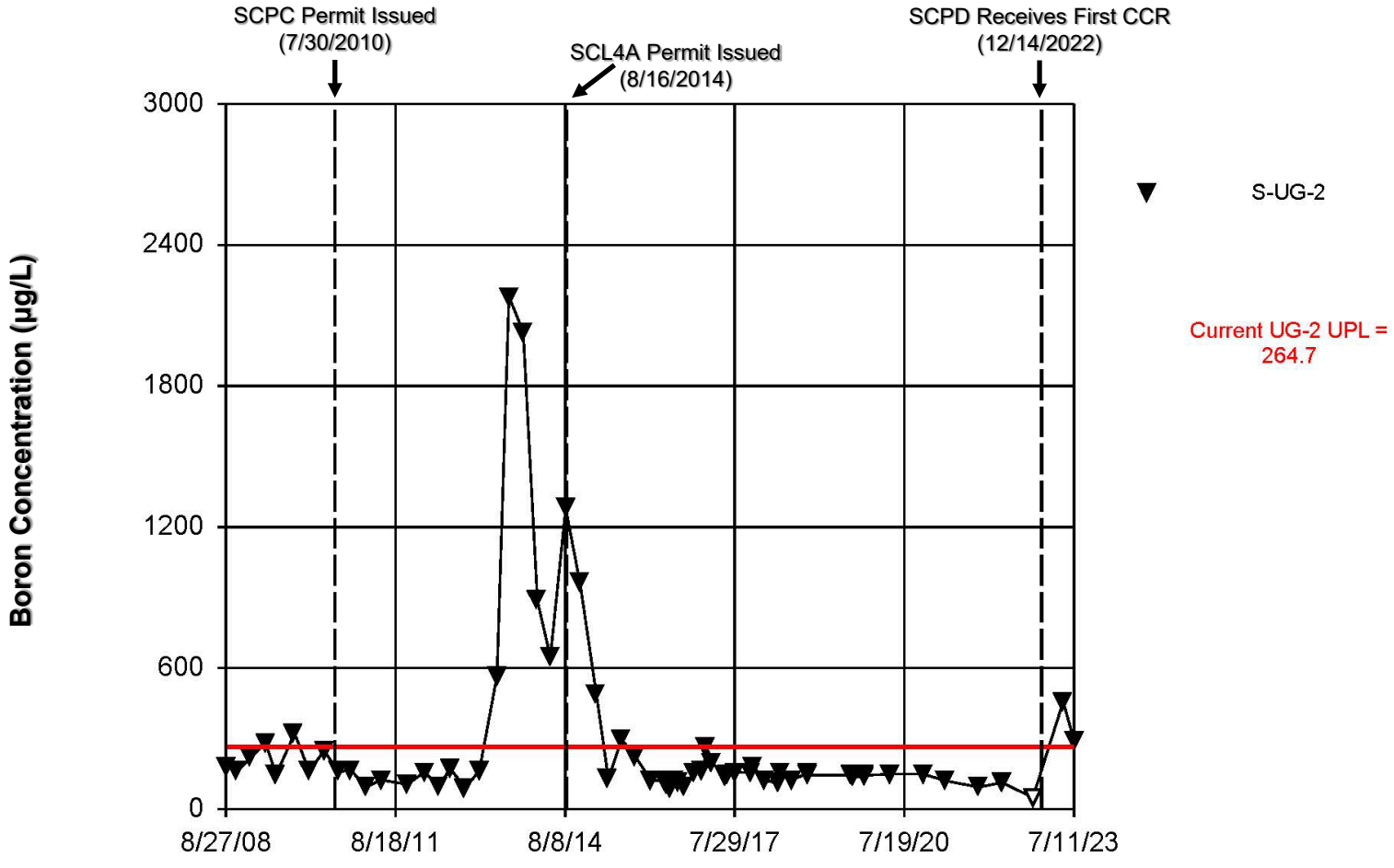
ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-03-29
PREPARED	JSI	PROJECT No.	23009
REVIEW	GTM		
APPROVED	MNH		

FIGURE 1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in

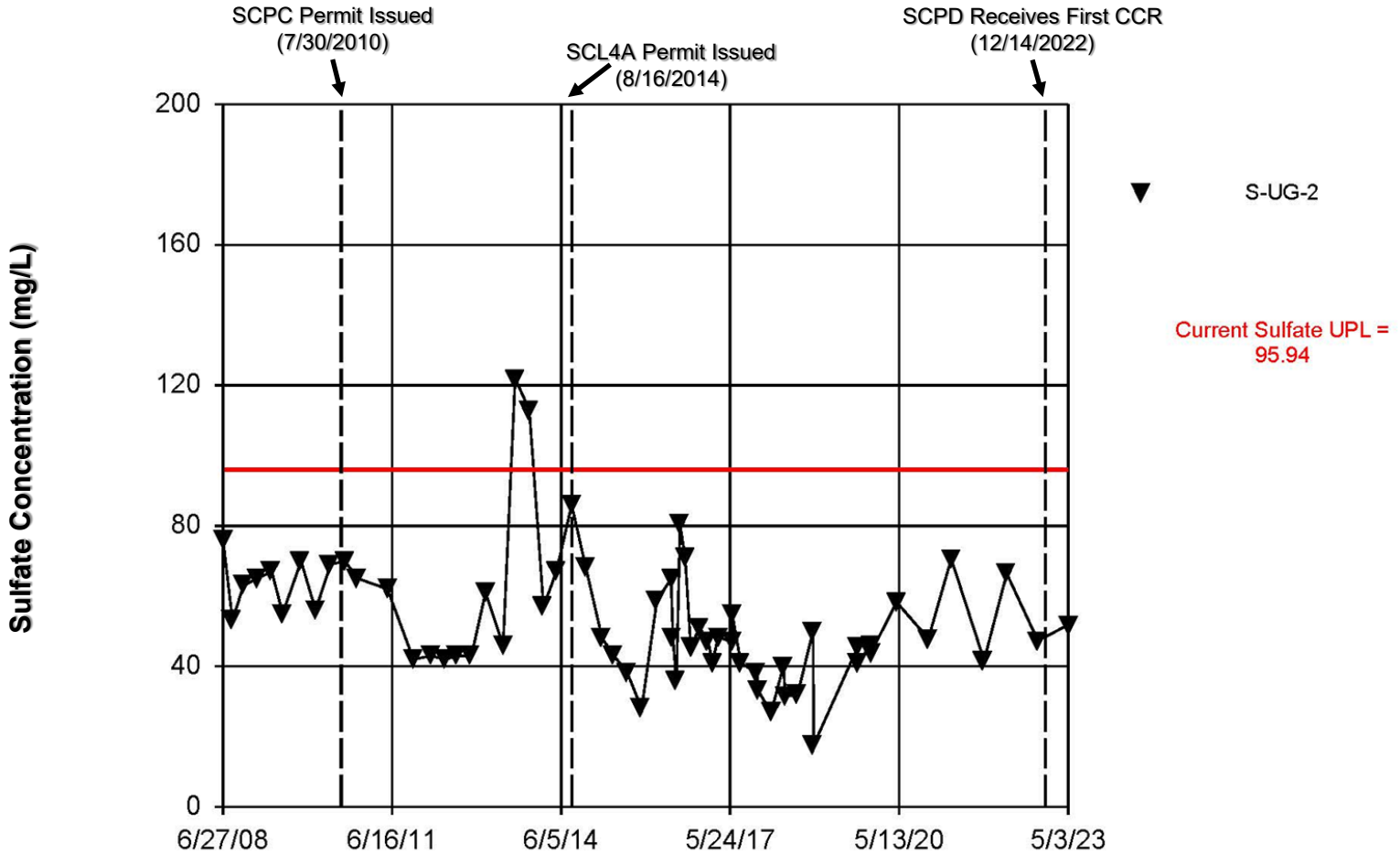
Path: C:\Users\GrantMoney\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings_Figures\4.3-SEC\4.3.2 - Production\Other Maps\Figure 1- SEC Well Locations.aprx



Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				Timeseries Plot of Boron Concentrations at UG-2		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-11-30	NA	23009	2

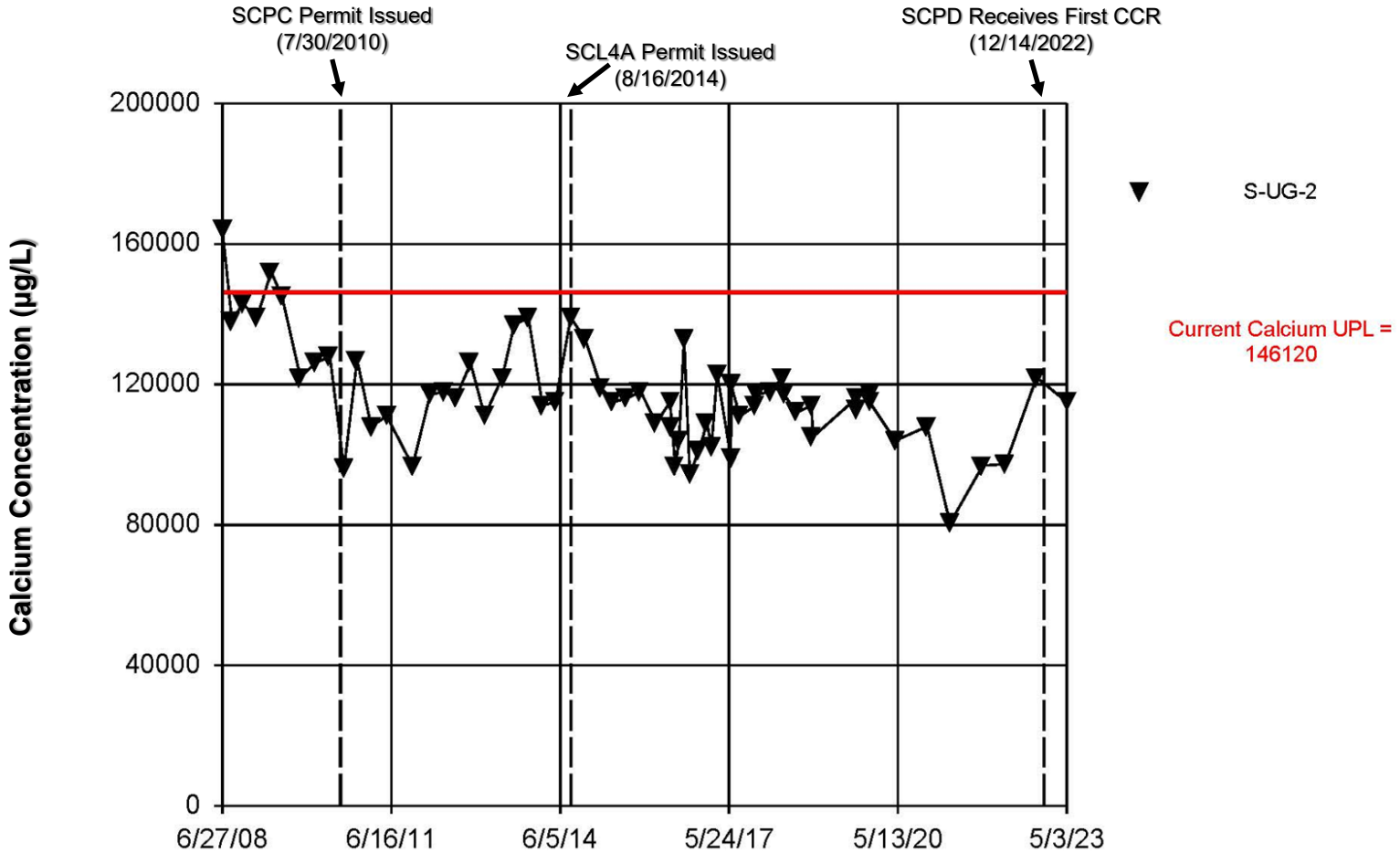
ROCKSMITH GEOENGINEERING



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

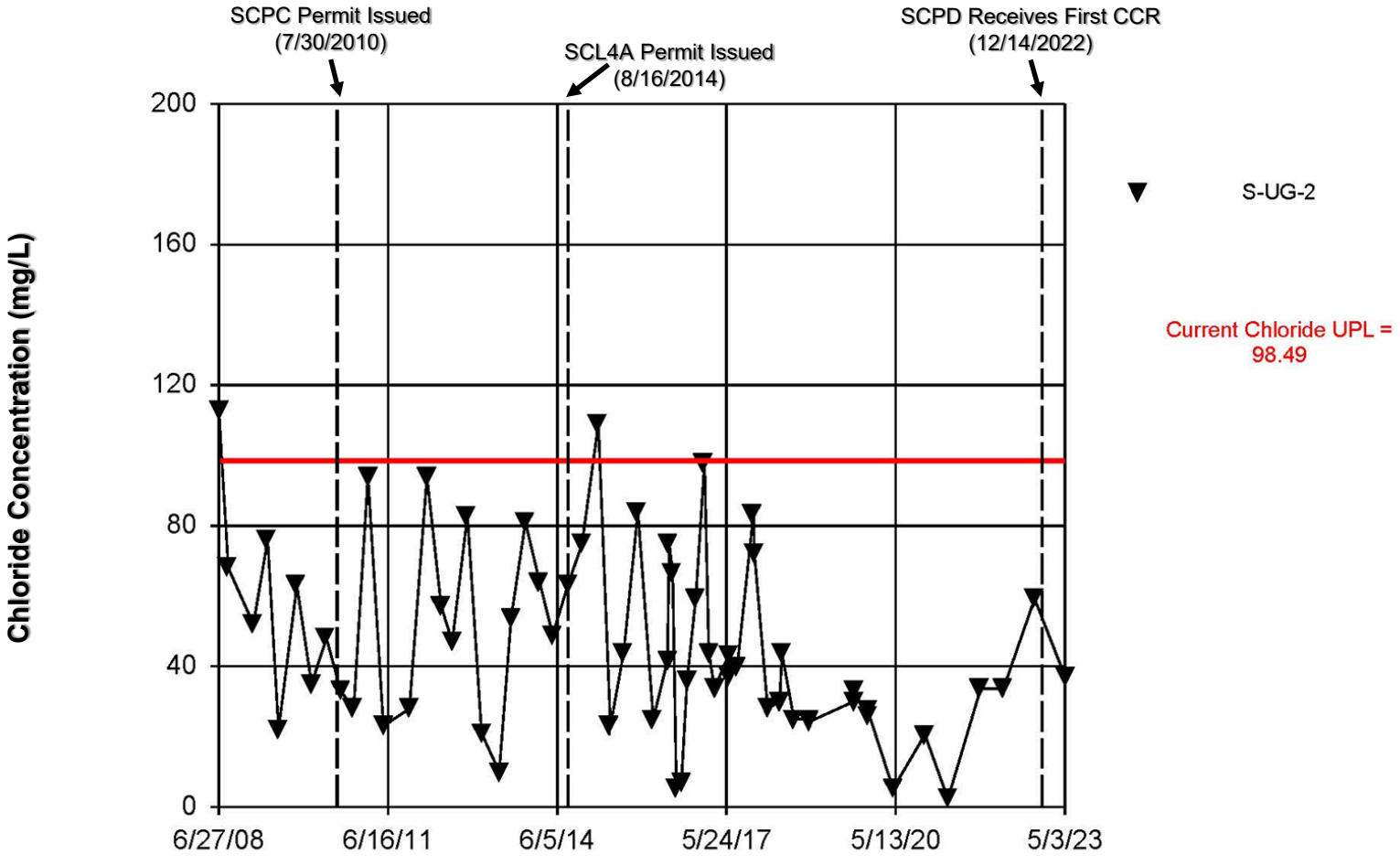
CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				Timeseries Plot of Sulfate Concentrations at UG-2		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-11-30	NA	23009	3

ROCKSMITH GEOENGINEERING



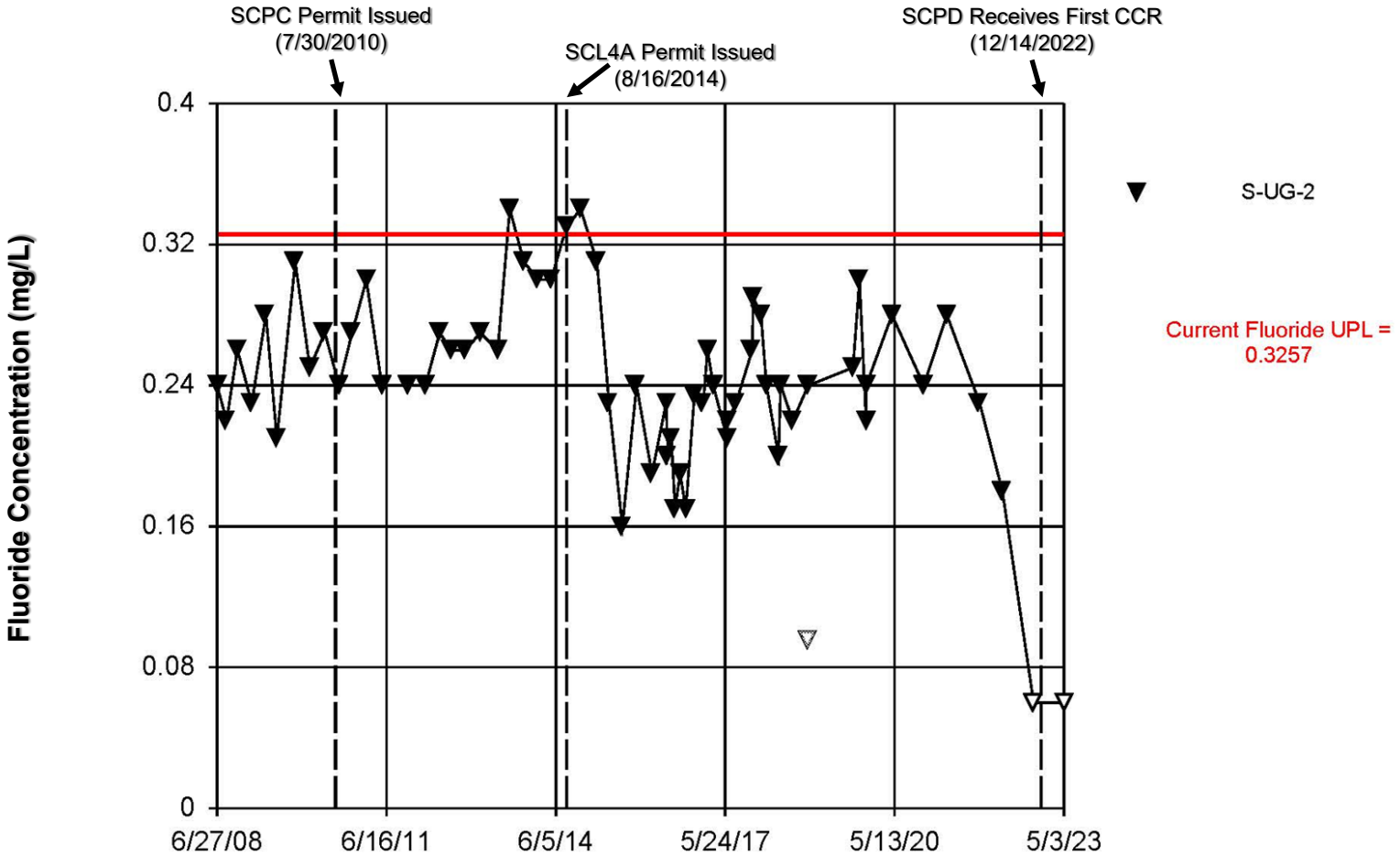
Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

CLIENT/PROJECT					TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER					Timeseries Plot of Calcium Concentrations at UG-2		
DRAWN	CHECKED	REVIEWED	DATE		Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-11-30		NA	23009	4



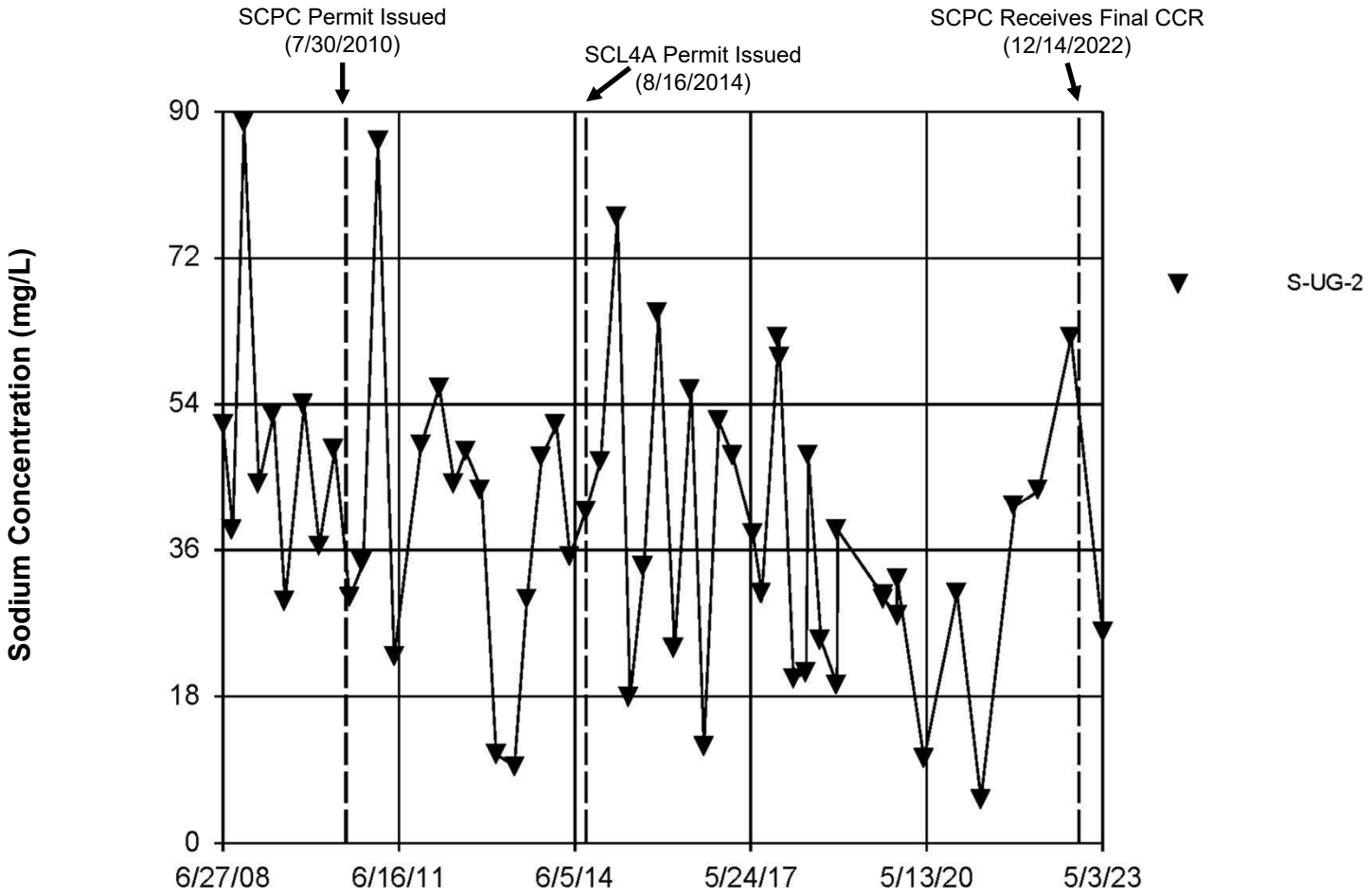
Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				Timeseries Plot of Chloride Concentrations at UG-2		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-11-30	NA	23009	5



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Hollow points (points not filled in) represent non-detects.

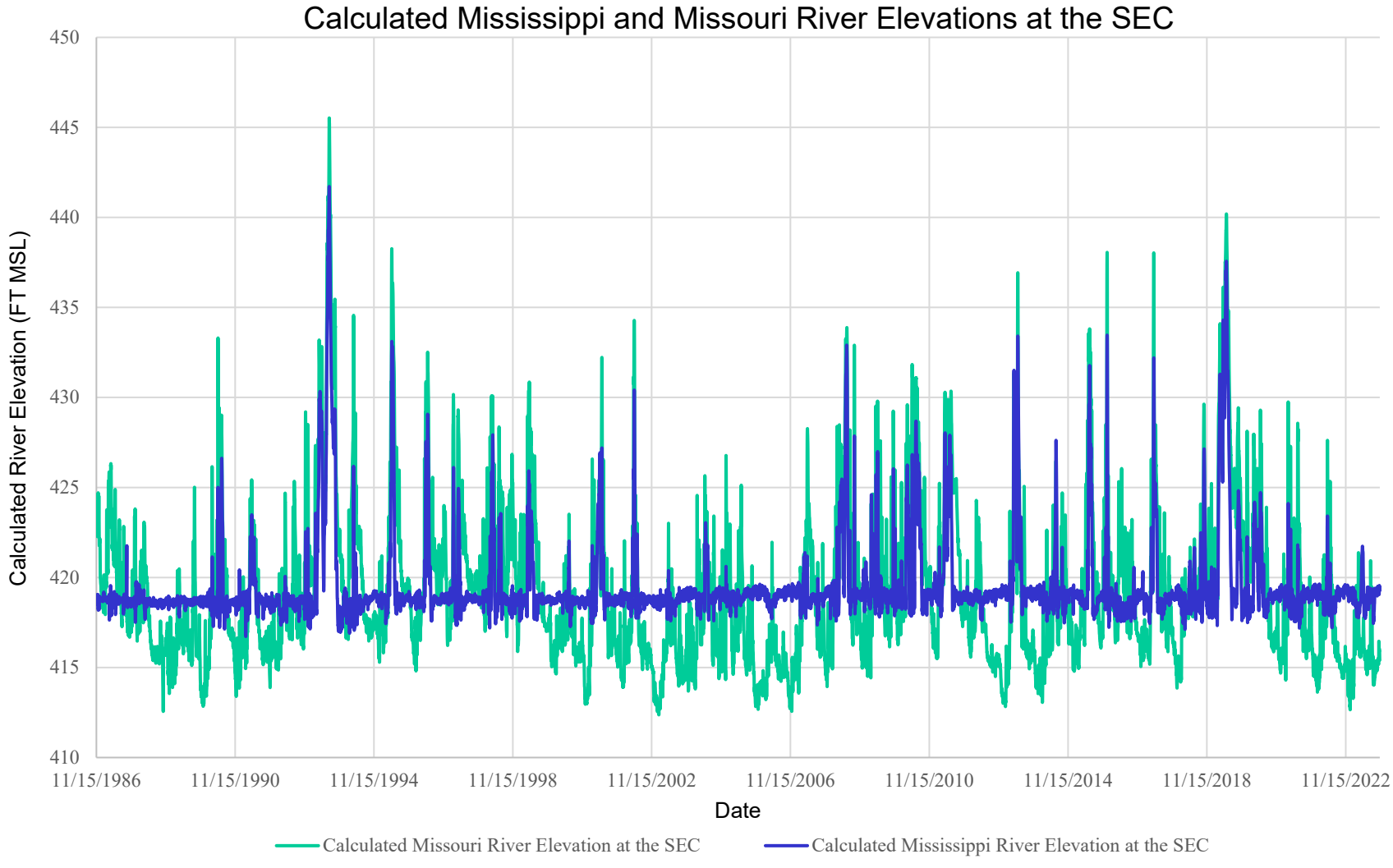
CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				Timeseries Plot of Fluoride Concentrations at UG-2		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-11-30	NA	23009	6



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) No UPL is calculated for sodium as it is not an Appendix III parameter.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				**Timeseries Plot of Sodium Concentrations at UG-2**		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-11-30	NA	23009	**7**

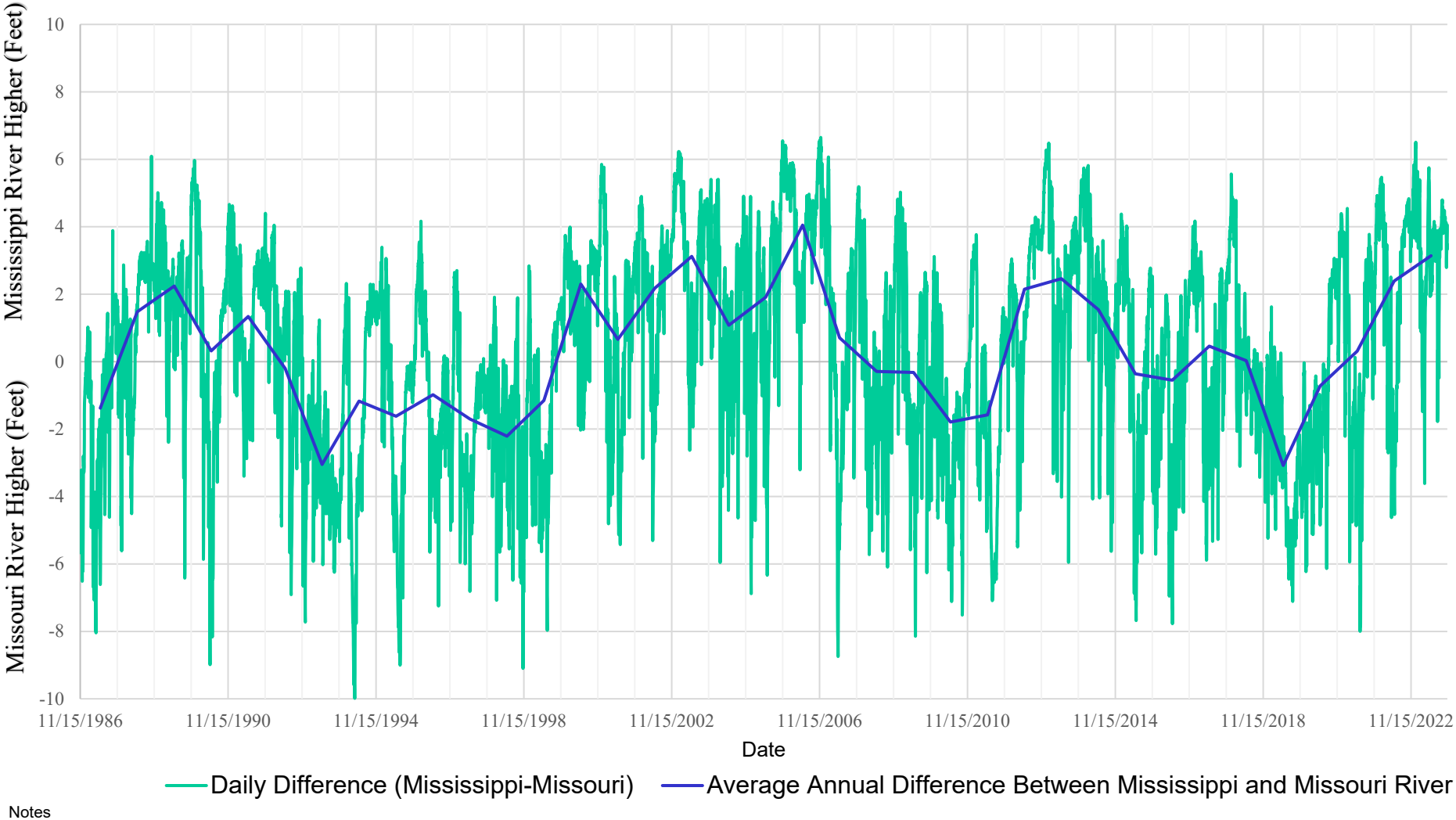
ROCKSMITH GEOENGINEERING



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				**Calculated Mississippi and Missouri River Elevations at the SEC**		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-11-30	NA	23009	**8**

ROCKSMITH GEOENGINEERING



Notes

1) Results in feet, values displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation.

CLIENT/PROJECT					TITLE
AMEREN MISSOURI **SIOUX ENERGY CENTER**				ROCKSMITH GEOENGINEERING	**Difference in Feet Between Mississippi and Missouri River Elevations at the SEC**
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2023-11-30		Rev No. NA / JOB NO. 23009 / FIGURE **9**

Appendix C

2023 Potentiometric Surface Maps

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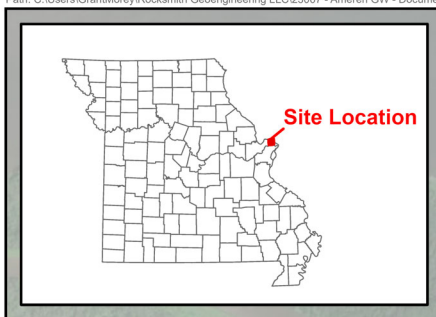

N

Mississippi River

Mississippi River Level
419.1

TP-2S (418.82)
TP-2M (418.80)
TP-2D (418.80)

TP-1S (418.84)
TP-1M (418.86)
TP-1D (418.86)

BMW-2S (418.43)
BMW-2D (418.45)

Sioux Energy Center

419

UMW-6D
(418.23)

PZ-2S (418.35)
PZ-2D (418.34)

PZ-3S (418.09)
PZ-3D (418.01)

AM-1S (418.58)
AM-1D (418.53)

418

LMW-9S (417.80)

UMW-5D (417.96)

BMW-1S (417.50)
BMW-1D (417.57)

BMW-3S (417.63)
BMW-3D (417.64)

UMW-1D (417.23)

LMW-1S
(417.35)

PZ-1S (417.22)
PZ-1D (417.19)

417

SCPA

LMW-8S (416.97)

UMW-4D
(416.99)

TP-3S (417.11)
TP-3M (417.11)
TP-3D (417.12)

SCPB

UMW-3D (416.35)

PZ-4S (416.09)
PZ-4D (416.32)

LMW-2S
(416.37)

LMW-7S (416.42)

UMW-2D (416.21)

416

LMW-6S (416.15)

PZ-9S (416.26)
PZ-9D (416.25)

LMW-3S (415.31)

LMW-4S
(415.31)

LMW-5S
(415.61)

TP-6S (414.82)
TP-6M (414.83)
TP-6D (414.82)

415

TP-5S (415.02)
TP-5M (415.04)
TP-5D (415.00)

UG-2 (414.75)

UG-1A (414.87)

UG-3 (415.22)

TP-4S (415.22)
TP-4M (415.21)
TP-4D (415.23)

414

SCL4A

SCPD

SCPC

TMW-2
(413.22)

413

TMW-1
(413.18)

DG-1 (412.91)

TMW-3
(412.95)

DG-2 (412.37)

DG-3
(412.13)

TMW-4
(412.50)

TMW-5
(412.60)

TMW-6
(412.84)

412

DG-5
(412.07)

DG-12 (413.50)

DG-4
(411.97)

DG-6 (412.20)

TP-7S (411.37)
TP-7M (411.35)
TP-7D (411.06)

DG-7 (412.36)

DG-9 (412.71)

TP-8S (411.29)
TP-8M (411.29)
TP-8D (411.27)

Estimated Missouri River Level
412.8

Missouri River

State of Missouri, Maxar

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closure in Progress)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

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
- Groundwater Flow Direction

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 WSP.
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.) FGD - FLUE GAS DESULFURIZATION.

REFERENCES

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

TITLE
JANUARY 3, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2023-08-21
PREPARED	GTM	PROJECT No.	23009
REVIEW	JSI	FIGURE C1	
APPROVED	MNH		

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
1 in
0

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2023 Annual Report\SEC_Apr282023_PM.aprx

N

Mississippi River
Mississippi River Level
418.0

TP-1S (417.57)
TP-1M (417.30)
TP-1D (417.31)
BMW-2S (417.11)
BMW-2D (417.17)
TP-2S (417.25)
TP-2M (417.26)
TP-2D (417.27)

Sioux Energy Center

418
AM-1S (417.21)
AM-1D (417.20)
UMW-6D (417.18)
PZ-2S (417.29)
PZ-2D (417.34)
PZ-3S (417.13)
PZ-3D (417.12)
LMW-9S (416.87)
UMW-5D (417.03)
417
BMW-3S (416.95)
BMW-3D (416.94)
BMW-1S (416.86)
BMW-1D (416.86)
UMW-1D (416.69)
LMW-1S (416.75)
PZ-1S (416.73)
PZ-1D (416.74)
SCPA
LMW-8S (416.38)
UMW-4D (416.56)
TP-3S (416.25)
TP-3M (416.28)
TP-3D (416.30)
SCPB
UMW-3D (416.22)
PZ-4S (416.17)
PZ-4D (416.22)
LMW-2S (416.13)
LMW-7S (416.11)
UMW-2D (416.07)
416
LMW-6S (415.90)
TP-6S (415.77)
TP-6M (415.75)
TP-6D (415.76)
LMW-3S (415.61)
LMW-4S (415.62)
LMW-5S (415.67)
PZ-9S (416.00)
PZ-9D (415.81)
UG-1A (415.70)
UG-2 (415.20)
TP-5S (415.53)
TP-5M (415.60)
TP-5D (415.59)
UG-3 (415.72)
TP-4S (415.45)
TP-4M (415.53)
TP-4D (415.51)
SCL4A
SCPD
SCPC
415
TMW-1 (414.68)
TMW-2 (414.70)
TMW-3 (414.74)
DG-1 (414.95)
DG-2 (414.54)
TMW-4 (414.52)
TMW-6 (414.62)
TMW-5 (414.53)
DG-3 (414.55)
TP-7S (414.05)
TP-7M (414.07)
TP-7D (414.07)
DG-4 (414.47)
DG-5 (414.50)
DG-6 (414.52)
DG-7 (414.57)
DG-12 (414.96)
DG-9 (414.67)
414
TP-8S (413.82)
TP-8M (413.83)
TP-8D (413.81)
Estimated Missouri River Level
414.9
Missouri River
State of Missouri, Maxar

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closure in Progress)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

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
- Groundwater Flow Direction

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 ROCKSMITH.
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.) FGD - FLUE GAS DESULFURIZATION.

REFERENCES

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

TITLE
APRIL 28, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2023-08-23
PREPARED	GTM	PROJECT No.	23009
REVIEW	JSI		
APPROVED	MNH		

FIGURE C2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

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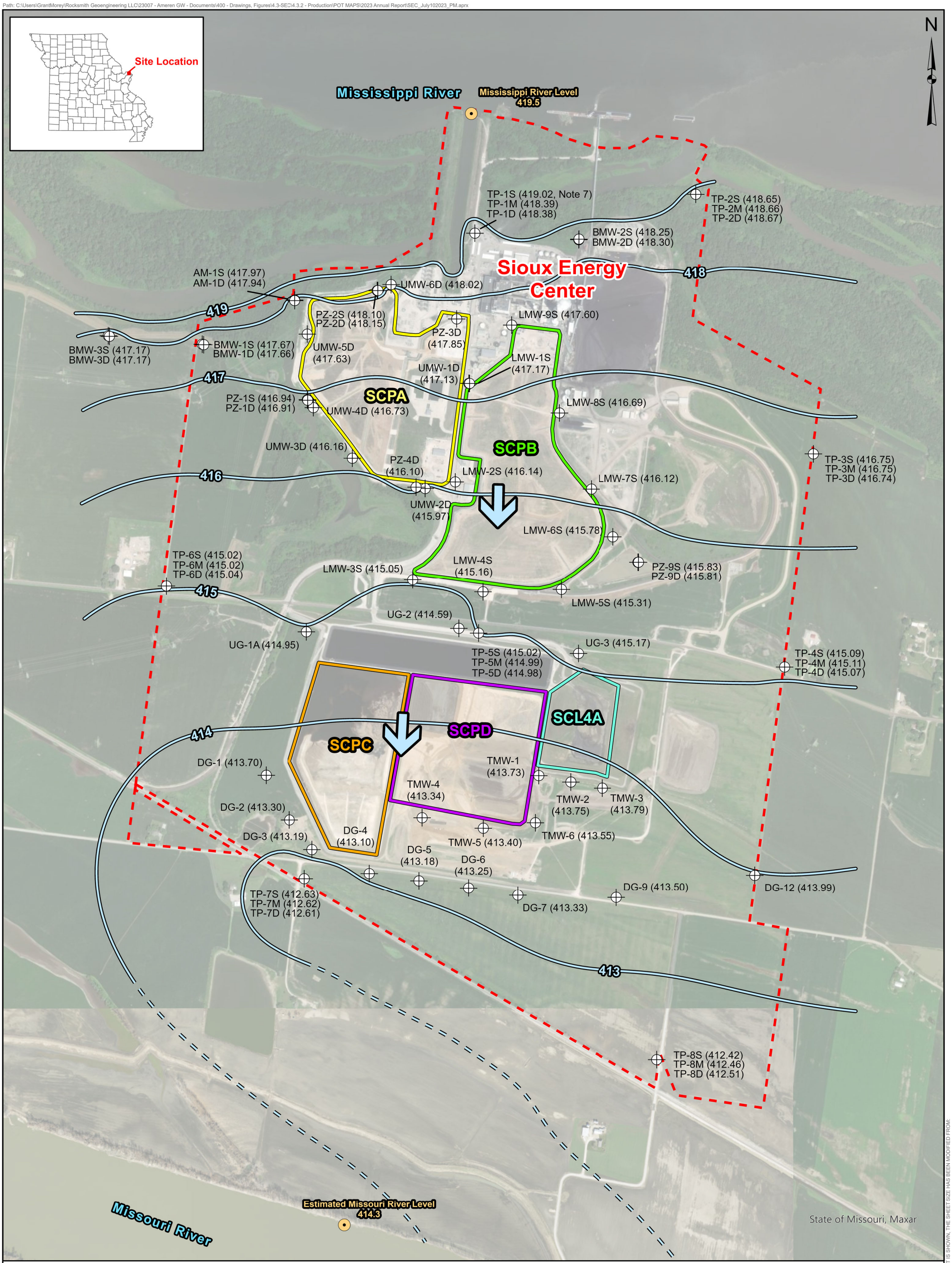

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
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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
- Groundwater Flow Direction

NOTES

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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.) FGD - FLUE GAS DESULFURIZATION.
7.) TP-1S NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

REFERENCES

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

TITLE
JULY 10, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2023-08-23
PREPARED	GTM	PROJECT No.	23009
REVIEW	JSI		
APPROVED	MNH		

FIGURE C3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2023 Annual Report\SEC_Nov092023_PM.aprx

N

Mississippi River
Mississippi River Level
419.6

Sioux Energy Center

TP-1S (419.13, Note 7)
TP-1M (418.41)
TP-1D (418.40)
TP-2S (418.76)
TP-2M (418.75)
TP-2D (418.76)
BMW-2S (418.30)
BMW-2D (418.34)
AM-1S (417.96)
AM-1D (417.92)
UMW-6D (418.01)
PZ-2S (418.10)
PZ-2D (418.14)
LMW-9S (417.50)
PZ-3D (417.78)
BMW-3S (417.04)
BMW-3D (417.04)
BMW-1S (417.06)
BMW-1D (417.09)
UMW-5D (417.60)
SCPA
UMW-1D (416.96)
LMW-1S (416.97)
LMW-8S (416.44)
PZ-1S (416.79)
PZ-1D (416.76)
UMW-4D (416.57)
SCPB
TP-3S (416.61)
TP-3M (416.62)
TP-3D (416.61)
UMW-3D (415.92)
LMW-2S (415.83)
PZ-4D (415.84)
LMW-7S (415.84)
UMW-2D (415.70)
LMW-6S (415.45)
PZ-9S (415.50)
PZ-9D (415.46)
LMW-3S (414.71)
LMW-4S (414.76)
LMW-5S (414.89)
TP-6S (414.61)
TP-6M (414.62)
TP-6D (414.63)
UG-1A (414.52)
UG-2 (414.18)
TP-5S (414.54)
TP-5M (414.57)
TP-5D (414.58)
UG-3 (414.75)
TP-4S (414.73)
TP-4M (414.73)
TP-4D (414.82)
SCPC
SCPD
SCL4A
TMW-2 (413.20)
DG-1 (413.25)
TMW-1 (413.18)
TMW-3 (413.23)
DG-2 (412.89)
DG-3 (412.71)
TMW-4 (412.80)
TMW-5 (412.86)
TMW-6 (413.00)
DG-12 (413.44)
TP-7S (412.16)
TP-7M (412.16)
TP-7D (412.16)
DG-4 (412.60)
DG-5 (412.68)
DG-6 (412.72)
DG-7 (412.79)
DG-9 (412.94)
TP-8S (411.91)
TP-8M (411.90)
TP-8D (411.91)
419
418
417
416
415
414
413
412
Estimated Missouri River Level
413.8
Missouri River
State of Missouri, Maxar

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closure in Progress)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

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
- Groundwater Flow Direction

0 500 1,000 1,500 2,000 Feet

NOTES

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REFERENCES

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.
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TITLE
NOVEMBER 9, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2023-12-29
PREPARED	GTM	PROJECT No.	23009
REVIEW	JSI		
APPROVED	MNH		

FIGURE C4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0