



2019 Annual Groundwater Monitoring and Corrective Action Report

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

Submitted to:

Ameren Missouri

1901 Chouteau Avenue St. Louis, Missouri 63103

Submitted by:

Golder Associates Inc.

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Project No. 153-140601

January 31, 2020

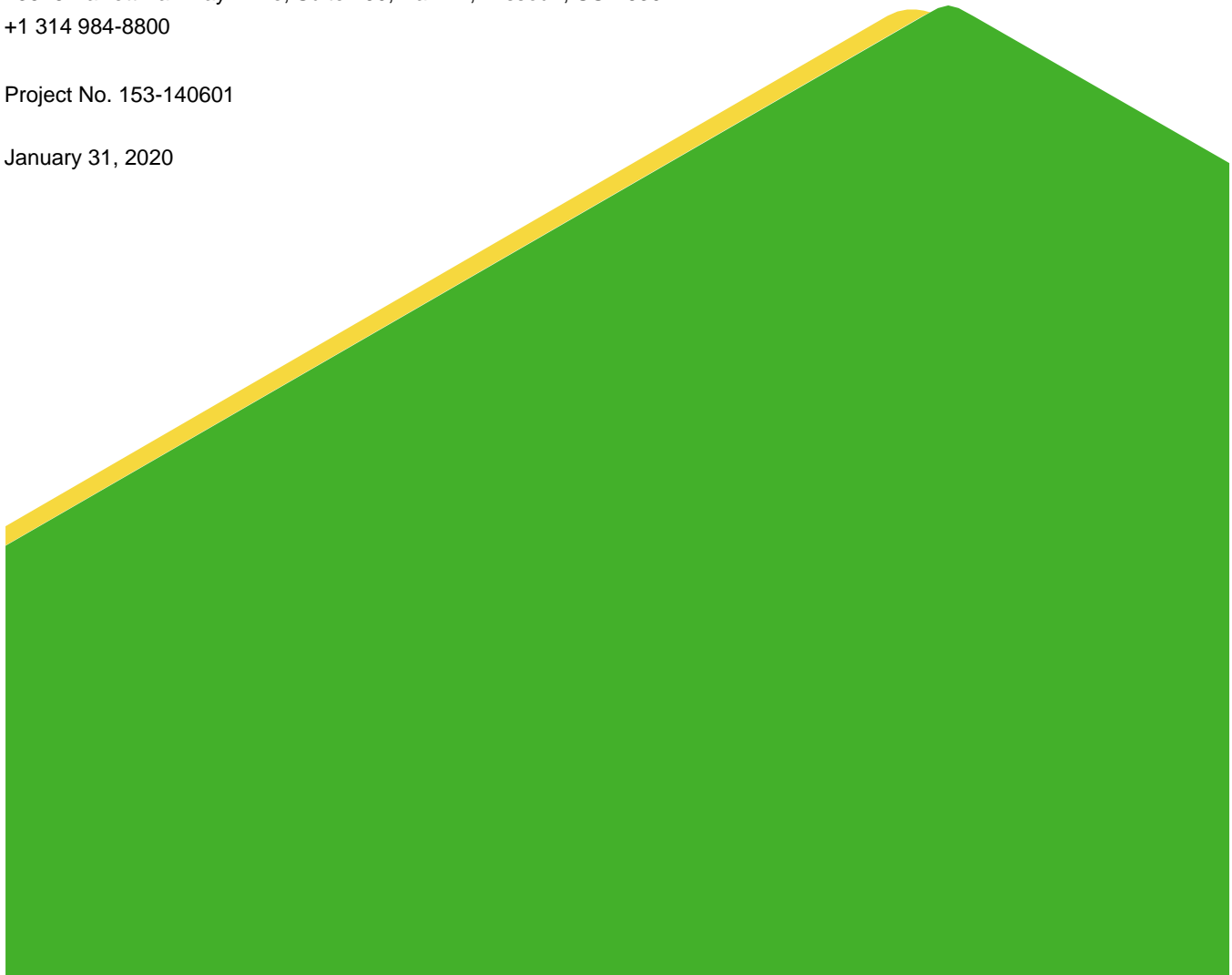


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1.0 INTRODUCTION

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 SCPB 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 SCPB describes CCR Rule groundwater monitoring activities from January 1, 2019 through December 31, 2019.

2.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the SCPB. The groundwater monitoring system consists of 11 groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**. No new monitoring wells were installed or decommissioned in 2019 as a part of the CCR Rule monitoring program for the SCPB. For more information on the groundwater monitoring network, details are provided in the 2017 Annual Groundwater Monitoring Report for the SCPB.

3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections review the sampling events completed for the SCPB CCR Unit in 2019. **Table 1** below provides a summary of the groundwater samples collected in 2019 including the number of samples, the date of sample collection, and the monitoring program.

Table 1 – Summary of Groundwater Sampling Dates

Sampling Event	Groundwater Monitoring Wells											Monitoring Program
	BMW-1S	BMW-3S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	LMW-9S	
	Date of Sample Collection											
January 2019 Verification Sampling	-	-	-	1/7/2019	1/7/2019	1/7/2019	-	-	-	1/7/2019	-	Detection
August 2019 Detection Monitoring	8/2/2019	8/2/2019	8/2/2019	8/6/2019	8/5/2019	8/5/2019	8/5/2019	8/5/2019	8/5/2019	8/6/2019	8/9/2019	Detection
October 2019 Verification Sampling	-	-	-	-	-	10/2/2019	-	-	10/1/2019	-	-	Detection
November 2019 Detection Monitoring	11/13/2019	11/13/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	Detection
Total Number of Samples Collected	2	2	2	3	3	4	2	2	3	3	2	NA

Notes:

- 1.) Detection Monitoring Events tested for Appendix III Parameters.
- 2.) Verification Sampling Events tested for Appendix III Parameters with initial exceedances that have not already been verified.
- 3.) "-" No sample collected.
- 4.) NA - Not applicable.

3.1 Detection Monitoring Program

A Detection Monitoring event was completed November 12-16, 2018. Verification Sampling and the Statistical Analysis to evaluate for Statistically Significant Increases (SSIs) for the November 2018 event were not completed

until 2019 and are, therefore, included in this report. Detections of Appendix III analytes triggered a verification sampling event, which was completed on January 7, 2019 and verified SSIs. **Table 2** summarizes the results of the statistical analysis of the November 2018 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. An Alternative Source Demonstration (ASD) was completed for these SSIs and is provided in **Appendix B**. This ASD demonstrates that the SSIs are not caused by the SCPB CCR Unit and the SCPB CCR Unit remains in Detection Monitoring.

A Detection Monitoring Event was Scheduled for May 2019, however due to flooding the event was completed August 2-9, 2019, and testing was completed for all Appendix III analytes. Statistical analysis of the data determined that there were SSIs. **Table 3** summarizes the results of the statistical analysis of the August 2019 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**. As with the November 2018 sampling event, SSIs in the monitoring well network are not caused by the SCPB CCR Unit and an ASD for this is provided in **Appendix C**.

As outlined in the Statistical Analysis Plan for this site, updates to the statistical limits are completed once four (4) to eight (8) new sample results are available. During the statistical analysis of the August 2019 sampling event, the statistical limits used to determine an SSI were updated according to the Statistical Analysis Plan.

A Detection Monitoring event was completed November 13-15, 2019, and testing was performed for all Appendix III analytes. Statistical analyses to evaluate for SSIs in the November 2019 data were not completed in 2019 and the results will be provided in the 2020 Annual Report. **Table 4** summarizes the results of the November 2019 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

3.2 Groundwater Elevation, Flow Rate and Direction

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

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

Groundwater flow direction and hydraulic gradient were estimated for the alluvial aquifer wells at the SEC using commercially available software. Results from this assessment indicate that while groundwater flow direction is variable, the overall net groundwater flow at the SEC was toward the northeast but ranged from north to south.

Horizontal gradients calculated by the program range from 0.0001 to 0.001 feet/foot with an estimated net annual groundwater velocity of approximately 4 feet per year.

4.0 STATUS OF THE GROUNDWATER MONITORING PROGRAM

The SCPB remains in Detection Monitoring. Section 5.0 provides a discussion of the activities planned for 2020.

4.1 Sampling Issues

Detection monitoring for the SEC was planned for May 2019. However, from approximately March to July 2019, some of the monitoring wells at the SEC were under water due to the flooding of the Mississippi and Missouri Rivers. This caused a delay in the planned sampling dates for the SCPB. On July 15-17, 2019, Golder performed post-flood monitoring well inspections at the SEC and found that at the SCPB only BMW-1S and BMW-3S had been impacted by the flood. On July 23, 2019, these monitoring wells were re-developed to remove floodwater impacts to the well prior to any future groundwater elevation measurements or groundwater samples being collected. After successful re-development, BMW-1S and BMW-3S were returned to service.

No other notable sampling issues were encountered in 2019.

5.0 ACTIVITIES PLANNED FOR 2020

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2020. Statistical analysis of the November 2019 Detection Monitoring data will be completed in 2020 and included in the 2020 Annual Report.

Tables

Table 2
November 2018 Detection Monitoring Results
SCPB Surface Impoundment
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS								
			BMW-1S	BMW-3S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	LMW-9S
November 2018 Detection Monitoring Event													
DATE	NA	NA	11/12/2018	11/12/2018	11/14/2018	11/16/2018	11/16/2018	11/14/2018	11/16/2018	11/14/2018	11/14/2018	11/14/2018	11/16/2018
pH	SU	6.369-7.556	7.46	7.49	7.40	6.95	6.75	6.06	6.74	6.81	6.84	6.93	6.82
BORON, TOTAL	µg/L	107.5	72.9 J	61.5 J	539	8,530	298	1,020	13,400	10,400	2,740	8,500	1,760
CALCIUM, TOTAL	µg/L	170,705	157,000	124,000	79,400	197,000	188,000	179,000	280,000	199,000	221,000	177,000	194,000
CHLORIDE, TOTAL	mg/L	12.34	6.7	10.1	42.6	174	51.3	2.9	27.9	2.2	11.6	38.9	278
FLUORIDE, TOTAL	mg/L	0.38	0.34	0.36	0.37	0.32	0.26	0.35	0.34	0.32	0.34	0.87	0.56
SULFATE, TOTAL	mg/L	34.49	28.8	25.6	62.2	188	54.3	50.0	912	385	396	405	163
TOTAL DISSOLVED SOLIDS	mg/L	565	556	436	346 J	1,040	709	814	1,530	771	1,020	925	1,020
January 2019 Verification Sampling													
DATE	NA	NA				1/7/2019	1/7/2019	1/7/2019					1/7/2019
pH	SU	6.369-7.556				7.00	6.85	6.94					6.97
BORON, TOTAL	µg/L	107.5											
CALCIUM, TOTAL	µg/L	170,705					168,000	139,000					182,000
CHLORIDE, TOTAL	mg/L	12.34											
FLUORIDE, TOTAL	mg/L	0.38											
SULFATE, TOTAL	mg/L	34.49						38.1 J					
TOTAL DISSOLVED SOLIDS	mg/L	565				1,010		530					

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. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Prediction Limits calculated using Sanitas Software.
6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
9. Only analytes/wells that were detected above the prediction limit and that had not already been verified were tested during Verification Sampling.

Table 3
August 2019 Detection Monitoring Results
SCPB Surface Impoundment
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS								
			BMW-1S	BMW-3S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	LMW-9S
August 2019 Detection Monitoring Event													
DATE	NA	NA	8/2/2019	8/2/2019	8/2/2019	8/6/2019	8/5/2019	8/5/2019	8/5/2019	8/5/2019	8/5/2019	8/6/2019	8/9/2019
pH	SU	6.387-7.785	6.90	7.53	7.41	7.14	6.99	6.82	6.83	6.87	6.82	6.96	6.66
BORON, TOTAL	µg/L	118	ND	ND	279 J	9,830	804	4,090	14,500	18,600	4,360	8,060	1,660
CALCIUM, TOTAL	µg/L	168,826	149,000	122,000	61,200	150,000	140,000	149,000	277,000 J	268,000	214,000	160,000	214,000
CHLORIDE, TOTAL	mg/L	12.32	8.8	10.6	16.5	76.9	36.1	25.3	36.6 J	3.6	29.1	35.1	75.6
FLUORIDE, TOTAL	mg/L	0.395	0.31	0.35	0.34	0.37	0.35	0.24	ND	ND	0.37	0.92	0.38
SULFATE, TOTAL	mg/L	37.38	34.1	25.3	38.9	339	273	210	930	787	431	432	281
TOTAL DISSOLVED SOLIDS	mg/L	565	548	452	285	982	800	851	1,870	1,660	1,150	1,010	1,110
October 2019 Verification Sampling Event													
DATE	NA	NA						10/2/2019				10/1/2019	
pH	SU	6.387-7.785						6.67				6.74	
BORON, TOTAL	µg/L	118											
CALCIUM, TOTAL	µg/L	168,826											
CHLORIDE, TOTAL	mg/L	12.32						22.1 J			25.2		
FLUORIDE, TOTAL	mg/L	0.395											
SULFATE, TOTAL	mg/L	37.38											
TOTAL DISSOLVED SOLIDS	mg/L	565						800					

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. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Prediction Limits calculated using Sanitas Software.
6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
9. Only analytes/wells that were detected above the prediction limit and that had not already been verified were tested during Verification Sampling.

Table 4
November 2019 Detection Monitoring Results
SCPB Surface Impoundment
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS								
		BMW-1S	BMW-3S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	LMW-9S
November 2019 Detection Monitoring Event												
DATE	NA	11/13/2019	11/13/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019
pH	SU	6.88	7.13	7.27	7.01	6.92	6.77	6.82	6.84	6.80	6.93	6.70
BORON, TOTAL	µg/L	118	80.1 J	1,270	11,200 J	961	4,290	14,900	19,300	4,830	8,590	1,640
CALCIUM, TOTAL	µg/L	143,000 J	102,000	79,400	170,000 J	165,000	180,000	266,000	292,000	208,000	153,000	189,000
CHLORIDE, TOTAL	mg/L	6.4	7.6	18.2	102	66.3	23.0	31.0	4.1	28.0	36.2	77.2
FLUORIDE, TOTAL	mg/L	0.28	0.23	0.29	0.31	0.26	0.16 J	0.39	0.21	0.21	0.83	0.27
SULFATE, TOTAL	mg/L	26.5	34.4	70.2	317	238	170	852	917	402	399	287
TOTAL DISSOLVED SOLIDS	mg/L	551	418	386	927	798	816	1,770	1,870	1,140	922	1,110

NOTES:

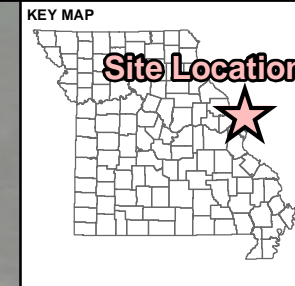
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect.
Values displayed as ND.
4. NA -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

Prepared By: TJG
Checked By: KAB
Reviewed By: CMR

Figures



Mississippi River



LEGEND

- Sioux Energy Center Property Boundary
- SCPB - Fly Ash Surface Impoundment
- Groundwater Monitoring Wells Used for SCPB CCR Rule Monitoring**
- Background Monitoring Well
- SCPB - Fly Ash Surface Impoundment Monitoring Well

Sioux Energy Center

BMW-3S

BMW-1S

LMW-9S

LMW-1S

LMW-8S

LMW-2S

LMW-7S

LMW-6S

LMW-3S

LMW-4S

LMW-5S



NOTE(S)
1.) ALL BOUNDARIES AND LOCATIONS ARE APPROXIMATE.

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

CLIENT
AMEREN MISSOURI
 SIOUX ENERGY CENTER 

PROJECT
 GROUNDWATER MONITORING PROGRAM

TITLE
SITE LOCATION AERIAL MAP AND MONITORING WELL LOCATIONS

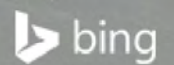
CONSULTANT	YYYY-MM-DD	2020-01-15
	DESIGNED	JSI
	PREPARED	RJF
	REVIEWED	EMS
	APPROVED	CMR



PROJECT NO.	CONTROL	REV.	FIGURE
153140601	1240	0	1

R:\TH_G\Projects\1531406 - Ameren GW Monitoring Program - ICD Phase 0303 - Sioux Energy\800 - FIGURE 5-DRAWINGS\PRODUCTION\2019 Annual Report\Figure 1 - SCPB - Fly Ash Surface Impoundment Monitoring - 2020-01-22 AT 8:31:33 PM

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



APPENDIX A

Laboratory Analytical Data

January 22, 2020

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

RE: Project: SCPB GW SAMPLING
Pace Project No.: 60291374

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on January 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

REV-1, 1/22/20: Sample IDs corrected.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 19-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2

Oklahoma Certification #: 9205/9935

Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12

Utah Certification #: KS000212018-8

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60291374001	S-LMW-2S	Water	01/07/19 09:24	01/09/19 03:00
60291374002	S-LMW-3S	Water	01/07/19 13:00	01/09/19 03:00
60291374003	S-LMW-4S	Water	01/07/19 11:45	01/09/19 03:00
60291374004	S-FB-1	Water	01/07/19 11:50	01/09/19 03:00
60291374005	S-DUP-1	Water	01/07/19 11:50	01/09/19 03:00
60291374006	S-LMW-8S	Water	01/07/19 10:30	01/09/19 03:00

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SAMPLE ANALYTE COUNT

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60291374001	S-LMW-2S	SM 2540C	AJS	1	PASI-K
60291374002	S-LMW-3S	EPA 200.7	CTR	1	PASI-K
60291374003	S-LMW-4S	EPA 200.7	CTR	2	PASI-K
		SM 2540C	AJS	1	PASI-K
60291374004	S-FB-1	EPA 300.0	MGS	3	PASI-K
		EPA 200.7	CTR	2	PASI-K
		SM 2540C	AJS	1	PASI-K
60291374005	S-DUP-1	EPA 300.0	MGS	3	PASI-K
		EPA 200.7	CTR	2	PASI-K
		SM 2540C	AJS	1	PASI-K
60291374006	S-LMW-8S	EPA 300.0	MGS	3	PASI-K
		EPA 200.7	CTR	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Sample: S-LMW-2S **Lab ID: 60291374001** Collected: 01/07/19 09:24 Received: 01/09/19 03:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1010	mg/L	5.0	5.0	1		01/09/19 16:05		

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ANALYTICAL RESULTS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Sample: S-LMW-3S **Lab ID: 60291374002** Collected: 01/07/19 13:00 Received: 01/09/19 03:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Calcium	168000	ug/L	200	53.5	1	01/09/19 15:16	01/10/19 10:51	7440-70-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Sample: S-LMW-4S **Lab ID: 60291374003** Collected: 01/07/19 11:45 Received: 01/09/19 03:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	382	ug/L	100	12.5	1	01/09/19 15:16	01/10/19 10:53	7440-42-8	
Calcium	139000	ug/L	200	53.5	1	01/09/19 15:16	01/10/19 10:53	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	530	mg/L	5.0	5.0	1		01/09/19 16:05		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	4.2	mg/L	1.0	0.29	1		01/09/19 17:17	16887-00-6	
Fluoride	0.20	mg/L	0.20	0.19	1		01/09/19 17:17	16984-48-8	
Sulfate	38.1	mg/L	10.0	2.4	10		01/09/19 18:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Sample: S-FB-1 **Lab ID: 60291374004** Collected: 01/07/19 11:50 Received: 01/09/19 03:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	<12.5	ug/L	100	12.5	1	01/09/19 15:16	01/10/19 10:55	7440-42-8	
Calcium	116J	ug/L	200	53.5	1	01/09/19 15:16	01/10/19 10:55	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		01/09/19 16:05		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.29	mg/L	1.0	0.29	1		01/09/19 18:53	16887-00-6	
Fluoride	<0.19	mg/L	0.20	0.19	1		01/09/19 18:53	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		01/09/19 18:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Sample: S-DUP-1 **Lab ID: 60291374005** Collected: 01/07/19 11:50 Received: 01/09/19 03:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	390	ug/L	100	12.5	1	01/09/19 15:16	01/10/19 11:02	7440-42-8	
Calcium	144000	ug/L	200	53.5	1	01/09/19 15:16	01/10/19 11:02	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	560	mg/L	5.0	5.0	1		01/09/19 16:05		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	4.2	mg/L	1.0	0.29	1		01/09/19 19:09	16887-00-6	
Fluoride	0.20J	mg/L	0.20	0.19	1		01/09/19 19:09	16984-48-8	
Sulfate	19.7	mg/L	5.0	1.2	5		01/10/19 12:27	14808-79-8	

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ANALYTICAL RESULTS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Sample: S-LMW-8S **Lab ID: 60291374006** Collected: 01/07/19 10:30 Received: 01/09/19 03:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Calcium	182000	ug/L	200	53.5	1	01/09/19 15:16	01/10/19 11:04	7440-70-2	

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QUALITY CONTROL DATA

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

QC Batch: 563906

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60291374002, 60291374003, 60291374004, 60291374005, 60291374006

METHOD BLANK: 2313489

Matrix: Water

Associated Lab Samples: 60291374002, 60291374003, 60291374004, 60291374005, 60291374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	01/10/19 10:39	
Calcium	ug/L	<53.5	200	53.5	01/10/19 10:39	

LABORATORY CONTROL SAMPLE: 2313490

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	944	94	85-115	
Calcium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2313491 2313492

Parameter	Units	60291374003		2313492		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Boron	ug/L	382	1000	1000	1350	97	95	70-130	1	20	
Calcium	ug/L	139000	10000	10000	151000	122	98	70-130	2	20	

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QUALITY CONTROL DATA

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

QC Batch: 563981 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60291374001, 60291374003, 60291374004, 60291374005

METHOD BLANK: 2313791 Matrix: Water
 Associated Lab Samples: 60291374001, 60291374003, 60291374004, 60291374005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/09/19 16:05	

LABORATORY CONTROL SAMPLE: 2313792

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

SAMPLE DUPLICATE: 2313793

Parameter	Units	60291374001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1010	1010	0	10	

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QUALITY CONTROL DATA

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

QC Batch: 563869 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60291374003, 60291374004, 60291374005

METHOD BLANK: 2313365 Matrix: Water

Associated Lab Samples: 60291374003, 60291374004, 60291374005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	01/09/19 16:10	
Fluoride	mg/L	<0.19	0.20	0.19	01/09/19 16:10	
Sulfate	mg/L	<0.24	1.0	0.24	01/09/19 16:10	

LABORATORY CONTROL SAMPLE: 2313366

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2313367 2313368

Parameter	Units	60291374003		2313367		2313368		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chloride	mg/L	4.2	5	5	9.4	9.5	104	106	90-110	1	15
Fluoride	mg/L	0.20	2.5	2.5	2.8	2.8	103	106	90-110	3	15
Sulfate	mg/L	38.1	50	50	90.3	88.5	104	101	90-110	2	15

MATRIX SPIKE SAMPLE: 2313369

Parameter	Units	60291320007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	407	250	671	106	90-110	

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QUALITY CONTROL DATA

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

QC Batch: 564071	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60291374005	

METHOD BLANK: 2314235 Matrix: Water
Associated Lab Samples: 60291374005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	01/10/19 09:48	

LABORATORY CONTROL SAMPLE: 2314236

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2314237 2314238

Parameter	Units	2314237		2314238		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60291371002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Sulfate	mg/L	29.7	25	25	57.6	53.6	112	96	90-110	7	15	M1	

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QUALIFIERS

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: SCPB GW SAMPLING

Pace Project No.: 60291374

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291374002	S-LMW-3S	EPA 200.7	563906	EPA 200.7	563987
60291374003	S-LMW-4S	EPA 200.7	563906	EPA 200.7	563987
60291374004	S-FB-1	EPA 200.7	563906	EPA 200.7	563987
60291374005	S-DUP-1	EPA 200.7	563906	EPA 200.7	563987
60291374006	S-LMW-8S	EPA 200.7	563906	EPA 200.7	563987
60291374001	S-LMW-2S	SM 2540C	563981		
60291374003	S-LMW-4S	SM 2540C	563981		
60291374004	S-FB-1	SM 2540C	563981		
60291374005	S-DUP-1	SM 2540C	563981		
60291374003	S-LMW-4S	EPA 300.0	563869		
60291374004	S-FB-1	EPA 300.0	563869		
60291374005	S-DUP-1	EPA 300.0	563869		
60291374005	S-DUP-1	EPA 300.0	564071		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

J. Criss

WO#: 60291374



Client Name: Golden Associates

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-351 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.9, 0.4 Corr. Factor 0.0 Corrected 0.9, 0.4

Date and initials of person A examining contents: 1/9/19

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Sample S-2MW-35 didn't have</u>
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>Labels on them (BP24, BP34)</u>
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: Jamie Chubb 1/9/19 Date: _____

MEMORANDUM**DATE** January 10, 2019**Project No.** 1531406**TO** Project File
Golder Associates**CC****FROM** Tommy Goodwin**EMAIL** tgoodwin@golder.com**DATA VALIDATION SUMMARY: AMEREN – SIOUX ENERGY CENTER – VERIFICATION SAMPLING – DATA PACKAGE 60291374**

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

- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result was not qualified on MS/MSD data alone.
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a sample or field duplicate RPD was not met, associated samples were qualified as estimates (J). If the results were less than the MDL (MDC for radionuclide analysis) or detected in a blank below the PQL the results were qualified as non-detects and estimates (UJ).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren-SCPB-VS-Jan 2019
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 1531406
 Validation Date: 1/10/19

Laboratory: Pace Analytical SDG #: 60291374
 Analytical Method (type and no.): Metals (200.7, 299.8), Hg (7470), Alk (SM 2320B), TDS (SM 2540C), Fe (SM 3500-Fe B), Anions (300.0), P (305.4), Ra (903.1 & 904.0)
 Matrix: Air Soil/Sed. Water Waste
 Sample Names S-LMW-2S, S-LMW-3S, S-LMW-4S, S-FB-1, S-DUP-1, S-LMW-8S

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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>1/7/19</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Q, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were hold times met for sample analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Were any matrix problems noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FB-1: Cu(116), _____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dup-1@ S-LMW-4S FB-1@ S-LMW-4S
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dup-1: SO ₄ ²⁻ (63)
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SO ₄ ²⁻
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Comments/Notes:

September 01, 2019

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

RE: Project: AMEREN SIOUX ENERGY CTR
Pace Project No.: 60310790

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between August 03, 2019 and August 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 19-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60310790001	S-LMW-1S	Water	08/02/19 15:00	08/03/19 02:50
60310790002	S-BMW-1S	Water	08/01/19 10:55	08/03/19 02:50
60310790003	S-BMW-3S	Water	08/01/19 11:45	08/03/19 02:50
60310790004	S-LMW-2S	Water	08/06/19 10:30	08/07/19 02:55
60310790005	S-LMW-3S	Water	08/05/19 16:20	08/07/19 02:55
60310790006	S-LMW-4S	Water	08/05/19 14:50	08/07/19 02:55
60310790007	S-LMW-5S	Water	08/05/19 10:30	08/07/19 02:55
60310790008	S-LMW-6S	Water	08/05/19 11:35	08/07/19 02:55
60310790009	S-LMW-7S	Water	08/05/19 12:55	08/07/19 02:55
60310790010	S-LMW-8S	Water	08/06/19 09:25	08/07/19 02:55
60310790011	S-LMW-DUP-1	Water	08/05/19 08:00	08/07/19 02:55
60310790012	S-LMW-DUP-2	Water	08/06/19 08:00	08/07/19 02:55
60310790013	S-LMW-FB-1	Water	08/05/19 14:08	08/07/19 02:55
60310790014	S-LMW-FB-2	Water	08/06/19 08:12	08/07/19 02:55
60310790015	S-LMW-9S	Water	08/09/19 09:35	08/10/19 01:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60310790001	S-LMW-1S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790002	S-BMW-1S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790003	S-BMW-3S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790004	S-LMW-2S	EPA 200.7	EMR, HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790005	S-LMW-3S	EPA 200.7	EMR, HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K
60310790006	S-LMW-4S	EPA 200.7	EMR, HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS, MGS	3	PASI-K
60310790007	S-LMW-5S	EPA 200.7	EMR, HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790008	S-LMW-6S	EPA 200.7	EMR, HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790009	S-LMW-7S	EPA 200.7	EMR, HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790010	S-LMW-8S	EPA 200.7	EMR, HKC	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60310790011	S-LMW-DUP-1	SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
60310790012	S-LMW-DUP-2	EPA 300.0	JDS	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
60310790013	S-LMW-FB-1	EPA 300.0	JDS, MGS	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
60310790014	S-LMW-FB-2	EPA 300.0	JDS	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
60310790015	S-LMW-9S	EPA 300.0	JDS	3	PASI-K
		EPA 200.7	EMR	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	AJS	1	PASI-K
		EPA 300.0	MGS	3	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-1S **Lab ID: 60310790001** Collected: 08/02/19 15:00 Received: 08/03/19 02:50 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							
Boron	279	ug/L	100	10.7	1	08/07/19 14:31	08/09/19 12:48	7440-42-8	
Calcium	61200	ug/L	200	50.0	1	08/07/19 14:31	08/08/19 16:33	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/07/19 14:31	08/08/19 16:33	7439-89-6	
Magnesium	15100	ug/L	50.0	13.0	1	08/07/19 14:31	08/08/19 16:33	7439-95-4	
Manganese	187	ug/L	5.0	2.1	1	08/07/19 14:31	08/08/19 16:33	7439-96-5	
Potassium	5320	ug/L	500	79.0	1	08/07/19 14:31	08/08/19 16:33	7440-09-7	
Sodium	15400	ug/L	500	144	1	08/07/19 14:31	08/08/19 16:33	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	186	mg/L	20.0	6.5	1		08/15/19 11:14		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	285	mg/L	10.0	10.0	1		08/08/19 11:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	16.5	mg/L	1.0	0.22	1		08/15/19 04:02	16887-00-6	
Fluoride	0.34	mg/L	0.20	0.085	1		08/15/19 04:02	16984-48-8	
Sulfate	38.9	mg/L	10.0	2.3	10		08/15/19 04:36	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-BMW-1S **Lab ID: 60310790002** Collected: 08/01/19 10:55 Received: 08/03/19 02:50 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							
Boron	70.8J	ug/L	100	10.7	1	08/07/19 14:31	08/09/19 12:51	7440-42-8	B
Calcium	149000	ug/L	200	50.0	1	08/07/19 14:31	08/08/19 16:36	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/07/19 14:31	08/08/19 16:36	7439-89-6	
Magnesium	28400	ug/L	50.0	13.0	1	08/07/19 14:31	08/08/19 16:36	7439-95-4	
Manganese	472	ug/L	5.0	2.1	1	08/07/19 14:31	08/08/19 16:36	7439-96-5	
Potassium	383J	ug/L	500	79.0	1	08/07/19 14:31	08/08/19 16:36	7440-09-7	
Sodium	5350	ug/L	500	144	1	08/07/19 14:31	08/08/19 16:36	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	432	mg/L	20.0	6.5	1		08/15/19 11:20		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	548	mg/L	10.0	10.0	1		08/07/19 13:13		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	8.8	mg/L	1.0	0.22	1		08/15/19 04:53	16887-00-6	
Fluoride	0.31	mg/L	0.20	0.085	1		08/15/19 04:53	16984-48-8	
Sulfate	34.1	mg/L	2.0	0.46	2		08/15/19 05:44	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-BMW-3S **Lab ID: 60310790003** Collected: 08/01/19 11:45 Received: 08/03/19 02:50 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							
Boron	73.9J	ug/L	100	10.7	1	08/07/19 14:31	08/09/19 12:53	7440-42-8	B
Calcium	122000	ug/L	200	50.0	1	08/07/19 14:31	08/08/19 16:38	7440-70-2	
Iron	44.3J	ug/L	50.0	14.0	1	08/07/19 14:31	08/08/19 16:38	7439-89-6	
Magnesium	22400	ug/L	50.0	13.0	1	08/07/19 14:31	08/08/19 16:38	7439-95-4	
Manganese	298	ug/L	5.0	2.1	1	08/07/19 14:31	08/08/19 16:38	7439-96-5	
Potassium	648	ug/L	500	79.0	1	08/07/19 14:31	08/08/19 16:38	7440-09-7	
Sodium	5280	ug/L	500	144	1	08/07/19 14:31	08/08/19 16:38	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	358	mg/L	20.0	6.5	1		08/15/19 11:25		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	452	mg/L	10.0	10.0	1		08/07/19 13:14		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	10.6	mg/L	1.0	0.22	1		08/15/19 06:01	16887-00-6	
Fluoride	0.35	mg/L	0.20	0.085	1		08/15/19 06:01	16984-48-8	
Sulfate	25.3	mg/L	2.0	0.46	2		08/15/19 06:17	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-2S **Lab ID: 60310790004** Collected: 08/06/19 10:30 Received: 08/07/19 02:55 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							
Boron	9830	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 19:50	7440-42-8	
Calcium	150000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 19:50	7440-70-2	
Iron	64.6	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 19:50	7439-89-6	
Magnesium	25200	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 19:50	7439-95-4	
Manganese	289	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 19:50	7439-96-5	
Potassium	8030	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 19:50	7440-09-7	
Sodium	75400	ug/L	500	144	1	08/08/19 13:00	08/12/19 14:45	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	248	mg/L	20.0	6.5	1		08/19/19 15:09		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	982	mg/L	10.0	10.0	1		08/12/19 15:09		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	76.9	mg/L	20.0	4.4	20		08/19/19 15:16	16887-00-6	
Fluoride	0.37	mg/L	0.20	0.085	1		08/19/19 15:01	16984-48-8	
Sulfate	339	mg/L	20.0	4.6	20		08/19/19 15:16	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-3S **Lab ID: 60310790005** Collected: 08/05/19 16:20 Received: 08/07/19 02:55 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							
Boron	804	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 19:52	7440-42-8	
Calcium	140000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 19:52	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 19:52	7439-89-6	
Magnesium	28700	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 19:52	7439-95-4	
Manganese	110	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 19:52	7439-96-5	
Potassium	5240	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 19:52	7440-09-7	
Sodium	41500	ug/L	500	144	1	08/08/19 13:00	08/12/19 14:48	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	284	mg/L	20.0	6.5	1		08/17/19 16:11		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	800	mg/L	10.0	10.0	1		08/10/19 09:50		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	36.1	mg/L	5.0	1.1	5		08/19/19 15:45	16887-00-6	
Fluoride	0.35	mg/L	0.20	0.085	1		08/19/19 15:30	16984-48-8	
Sulfate	273	mg/L	50.0	11.5	50		08/21/19 22:02	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-4S **Lab ID: 60310790006** Collected: 08/05/19 14:50 Received: 08/07/19 02:55 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							
Boron	4090	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 19:54	7440-42-8	
Calcium	149000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 19:54	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 19:54	7439-89-6	
Magnesium	31900	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 19:54	7439-95-4	
Manganese	395	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 19:54	7439-96-5	
Potassium	4210	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 19:54	7440-09-7	
Sodium	21600	ug/L	500	144	1	08/08/19 13:00	08/12/19 14:50	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	419	mg/L	20.0	6.5	1		08/17/19 16:15		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	851	mg/L	10.0	10.0	1		08/10/19 09:50		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	25.3	mg/L	5.0	1.1	5		08/19/19 16:44	16887-00-6	
Fluoride	0.24	mg/L	0.20	0.085	1		08/19/19 16:00	16984-48-8	
Sulfate	210	mg/L	20.0	4.6	20		08/21/19 22:46	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-5S **Lab ID: 60310790007** Collected: 08/05/19 10:30 Received: 08/07/19 02:55 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							
Boron	14500	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 19:56	7440-42-8	
Calcium	277000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 19:56	7440-70-2	M1
Iron	114	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 19:56	7439-89-6	
Magnesium	56500	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 19:56	7439-95-4	
Manganese	1660	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 19:56	7439-96-5	
Potassium	5050	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 19:56	7440-09-7	
Sodium	148000	ug/L	500	144	1	08/08/19 13:00	08/12/19 14:53	7440-23-5	M1
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	310	mg/L	20.0	6.5	1		08/17/19 16:20		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1870	mg/L	20.0	20.0	1		08/10/19 09:50		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	36.6	mg/L	2.0	0.44	2		08/19/19 17:44	16887-00-6	M1
Fluoride	<0.085	mg/L	0.20	0.085	1		08/19/19 16:59	16984-48-8	
Sulfate	930	mg/L	100	23.0	100		08/19/19 18:28	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-6S **Lab ID: 60310790008** Collected: 08/05/19 11:35 Received: 08/07/19 02:55 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							
Boron	18600	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 20:03	7440-42-8	
Calcium	268000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 20:03	7440-70-2	
Iron	202	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 20:03	7439-89-6	
Magnesium	66900	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 20:03	7439-95-4	
Manganese	511	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 20:03	7439-96-5	
Potassium	5390	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 20:03	7440-09-7	
Sodium	102000	ug/L	500	144	1	08/08/19 13:00	08/12/19 15:00	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	377	mg/L	20.0	6.5	1		08/17/19 16:39		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1660	mg/L	13.3	13.3	1		08/10/19 09:50		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	3.6	mg/L	1.0	0.22	1		08/19/19 19:42	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		08/19/19 19:42	16984-48-8	
Sulfate	787	mg/L	100	23.0	100		08/19/19 20:12	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-7S **Lab ID: 60310790009** Collected: 08/05/19 12:55 Received: 08/07/19 02:55 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							
Boron	4360	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 20:09	7440-42-8	
Calcium	214000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 20:09	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 20:09	7439-89-6	
Magnesium	63700	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 20:09	7439-95-4	
Manganese	377	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 20:09	7439-96-5	
Potassium	4910	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 20:09	7440-09-7	
Sodium	38400	ug/L	500	144	1	08/08/19 13:00	08/12/19 15:02	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	402	mg/L	20.0	6.5	1		08/17/19 16:45		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1150	mg/L	13.3	13.3	1		08/10/19 09:50		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	29.1	mg/L	2.0	0.44	2		08/19/19 20:42	16887-00-6	
Fluoride	0.37	mg/L	0.20	0.085	1		08/19/19 20:27	16984-48-8	
Sulfate	431	mg/L	50.0	11.5	50		08/19/19 20:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-8S **Lab ID: 60310790010** Collected: 08/06/19 09:25 Received: 08/07/19 02:55 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							
Boron	8060	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 20:12	7440-42-8	
Calcium	160000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 20:12	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 20:12	7439-89-6	
Magnesium	41500	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 20:12	7439-95-4	
Manganese	460	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 20:12	7439-96-5	
Potassium	4810	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 20:12	7440-09-7	
Sodium	77200	ug/L	500	144	1	08/08/19 13:00	08/12/19 15:04	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	261	mg/L	20.0	6.5	1		08/19/19 15:18		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1010	mg/L	10.0	10.0	1		08/12/19 15:09		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	35.1	mg/L	5.0	1.1	5		08/19/19 21:27	16887-00-6	
Fluoride	0.92	mg/L	0.20	0.085	1		08/19/19 21:12	16984-48-8	
Sulfate	432	mg/L	50.0	11.5	50		08/19/19 21:41	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-DUP-1 **Lab ID: 60310790011** Collected: 08/05/19 08:00 Received: 08/07/19 02:55 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							
Boron	19000	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 18:09	7440-42-8	
Calcium	294000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 18:09	7440-70-2	
Iron	72.9	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 18:09	7439-89-6	
Magnesium	72100	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 18:09	7439-95-4	
Manganese	535	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 18:09	7439-96-5	
Potassium	5370	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 18:09	7440-09-7	
Sodium	106000	ug/L	500	144	1	08/08/19 13:00	08/09/19 18:09	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	385	mg/L	20.0	6.5	1		08/17/19 16:49		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1590	mg/L	13.3	13.3	1		08/10/19 09:50		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	3.7	mg/L	1.0	0.22	1		08/19/19 21:56	16887-00-6	
Fluoride	0.25	mg/L	0.20	0.085	1		08/19/19 21:56	16984-48-8	
Sulfate	863	mg/L	50.0	11.5	50		08/19/19 22:56	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-DUP-2 **Lab ID: 60310790012** Collected: 08/06/19 08:00 Received: 08/07/19 02:55 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							
Boron	11200	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 18:11	7440-42-8	
Calcium	180000	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 18:11	7440-70-2	
Iron	42.5J	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 18:11	7439-89-6	
Magnesium	29600	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 18:11	7439-95-4	
Manganese	333	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 18:11	7439-96-5	
Potassium	8470	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 18:11	7440-09-7	
Sodium	71700	ug/L	500	144	1	08/08/19 13:00	08/09/19 18:11	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	251	mg/L	20.0	6.5	1		08/19/19 15:24		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	941	mg/L	10.0	10.0	1		08/12/19 15:09		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	77.8	mg/L	10.0	2.2	10		08/21/19 23:01	16887-00-6	
Fluoride	0.37	mg/L	0.20	0.085	1		08/19/19 23:10	16984-48-8	
Sulfate	335	mg/L	50.0	11.5	50		08/19/19 23:40	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-FB-1 **Lab ID: 60310790013** Collected: 08/05/19 14:08 Received: 08/07/19 02:55 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							
Boron	46.6J	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 18:14	7440-42-8	
Calcium	252	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 18:14	7440-70-2	B
Iron	<14.0	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 18:14	7439-89-6	
Magnesium	66.3	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 18:14	7439-95-4	B
Manganese	<2.1	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 18:14	7439-96-5	
Potassium	<79.0	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 18:14	7440-09-7	
Sodium	229J	ug/L	500	144	1	08/08/19 13:00	08/09/19 18:14	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	<6.5	mg/L	20.0	6.5	1		08/17/19 16:54		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	20.0	mg/L	5.0	5.0	1		08/10/19 09:51		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.22	mg/L	1.0	0.22	1		08/19/19 23:55	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		08/19/19 23:55	16984-48-8	
Sulfate	<0.23	mg/L	1.0	0.23	1		08/19/19 23:55	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-FB-2 **Lab ID: 60310790014** Collected: 08/06/19 08:12 Received: 08/07/19 02:55 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							
Boron	21.5J	ug/L	100	10.7	1	08/08/19 13:00	08/09/19 18:16	7440-42-8	
Calcium	<50.0	ug/L	200	50.0	1	08/08/19 13:00	08/09/19 18:16	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/08/19 13:00	08/09/19 18:16	7439-89-6	
Magnesium	17.2J	ug/L	50.0	13.0	1	08/08/19 13:00	08/09/19 18:16	7439-95-4	B
Manganese	<2.1	ug/L	5.0	2.1	1	08/08/19 13:00	08/09/19 18:16	7439-96-5	
Potassium	<79.0	ug/L	500	79.0	1	08/08/19 13:00	08/09/19 18:16	7440-09-7	
Sodium	148J	ug/L	500	144	1	08/08/19 13:00	08/09/19 18:16	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<6.5	mg/L	20.0	6.5	1		08/19/19 15:28		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	6.0	mg/L	5.0	5.0	1		08/12/19 15:10		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.22	mg/L	1.0	0.22	1		08/20/19 00:40	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		08/20/19 00:40	16984-48-8	
Sulfate	<0.23	mg/L	1.0	0.23	1		08/20/19 00:40	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Sample: S-LMW-9S **Lab ID: 60310790015** Collected: 08/09/19 09:35 Received: 08/10/19 01:45 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							
Boron	1660	ug/L	100	10.7	1	08/14/19 10:28	08/15/19 13:28	7440-42-8	
Calcium	214000	ug/L	200	50.0	1	08/14/19 10:28	08/15/19 13:28	7440-70-2	
Iron	66.7	ug/L	50.0	14.0	1	08/14/19 10:28	08/15/19 13:28	7439-89-6	
Magnesium	70100	ug/L	50.0	13.0	1	08/14/19 10:28	08/15/19 13:28	7439-95-4	
Manganese	401	ug/L	5.0	2.1	1	08/14/19 10:28	08/15/19 13:28	7439-96-5	
Potassium	5060	ug/L	500	79.0	1	08/14/19 10:28	08/15/19 13:28	7440-09-7	
Sodium	52300	ug/L	500	144	1	08/14/19 10:28	08/15/19 13:28	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	492	mg/L	20.0	6.5	1		08/19/19 15:33		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1110	mg/L	13.3	13.3	1		08/14/19 11:00		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	75.6	mg/L	10.0	2.2	10		08/22/19 02:35	16887-00-6	
Fluoride	0.38	mg/L	0.20	0.085	1		08/22/19 02:18	16984-48-8	
Sulfate	281	mg/L	50.0	11.5	50		08/22/19 02:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 601714 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60310790001, 60310790002, 60310790003

METHOD BLANK: 2461467 Matrix: Water

Associated Lab Samples: 60310790001, 60310790002, 60310790003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	11.8J	100	10.7	08/09/19 12:44	
Calcium	ug/L	<50.0	200	50.0	08/08/19 16:31	
Iron	ug/L	<14.0	50.0	14.0	08/08/19 16:31	
Magnesium	ug/L	<13.0	50.0	13.0	08/08/19 16:31	
Manganese	ug/L	<2.1	5.0	2.1	08/08/19 16:31	
Potassium	ug/L	<79.0	500	79.0	08/08/19 16:31	
Sodium	ug/L	<144	500	144	08/08/19 16:31	

LABORATORY CONTROL SAMPLE: 2461468

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	987	99	85-115	
Calcium	ug/L	10000	9780	98	85-115	
Iron	ug/L	10000	9860	99	85-115	
Magnesium	ug/L	10000	9530	95	85-115	
Manganese	ug/L	1000	988	99	85-115	
Potassium	ug/L	10000	9940	99	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2461469 2461470

Parameter	Units	60310791001		MSD		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result							
Boron	ug/L	217	1000	1000	1230	1210	101	100	70-130	1	20			
Calcium	ug/L	58100	10000	10000	70000	68700	119	106	70-130	2	20			
Iron	ug/L	1010	10000	10000	10700	10800	97	97	70-130	1	20			
Magnesium	ug/L	16700	10000	10000	26800	26400	101	97	70-130	1	20			
Manganese	ug/L	113	1000	1000	1100	1100	98	99	70-130	0	20			
Potassium	ug/L	4210	10000	10000	14400	14300	102	101	70-130	0	20			
Sodium	ug/L	14000	10000	10000	24700	24300	107	103	70-130	2	20			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2461471 2461472

Parameter	Units	60310791002		MSD		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result							
Boron	ug/L	12400	1000	1000	13200	13600	84	116	70-130	2	20			
Calcium	ug/L	171000	10000	10000	180000	184000	94	127	70-130	2	20			

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2461471												2461472	
Parameter	Units	60310791002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
Iron	ug/L	416	10000	10000	10100	10200	97	98	70-130	0	20		
Magnesium	ug/L	5320	10000	10000	14500	14700	92	94	70-130	1	20		
Manganese	ug/L	168	1000	1000	1140	1160	97	99	70-130	1	20		
Potassium	ug/L	22900	10000	10000	33000	33600	101	107	70-130	2	20		
Sodium	ug/L	46500	10000	10000	56500	57800	100	113	70-130	2	20		

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR
Pace Project No.: 60310790

QC Batch: 601954 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60310790004, 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790010

METHOD BLANK: 2462491 Matrix: Water
Associated Lab Samples: 60310790004, 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<10.7	100	10.7	08/09/19 19:07	
Calcium	ug/L	56.0J	200	50.0	08/09/19 19:07	
Iron	ug/L	<14.0	50.0	14.0	08/12/19 14:09	
Magnesium	ug/L	53.9	50.0	13.0	08/09/19 19:07	
Manganese	ug/L	<2.1	5.0	2.1	08/09/19 19:07	
Potassium	ug/L	<79.0	500	79.0	08/09/19 19:07	
Sodium	ug/L	<144	500	144	08/09/19 19:07	

LABORATORY CONTROL SAMPLE: 2462492

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	923	92	85-115	
Calcium	ug/L	10000	9410	94	85-115	
Iron	ug/L	10000	8860	89	85-115	
Magnesium	ug/L	10000	9600	96	85-115	
Manganese	ug/L	1000	948	95	85-115	
Potassium	ug/L	10000	9630	96	85-115	
Sodium	ug/L	10000	9760	98	85-115	

MATRIX SPIKE SAMPLE: 2462493

Parameter	Units	60311085001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	0.37 mg/L	1000	1380	101	70-130	
Calcium	ug/L	160 mg/L	10000	185000	243	70-130 M1	
Iron	ug/L	62.8	10000	10400	103	70-130	
Magnesium	ug/L	42400	10000	55800	134	70-130 M1	
Manganese	ug/L	132	1000	1100	97	70-130	
Potassium	ug/L	1490	10000	11800	103	70-130	
Sodium	ug/L	70800	10000	88100	173	70-130 M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2462494 2462495

Parameter	Units	60310790007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	14500	1000	1000	15400	15800	90	128	70-130	2	20	
Calcium	ug/L	277000	10000	10000	275000	285000	-18	83	70-130	4	20	M1
Iron	ug/L	114	10000	10000	8230	8550	81	84	70-130	4	20	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Parameter	Units	2462494		2462495		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60310790007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Magnesium	ug/L	56500	10000	10000	63800	66700	73	102	70-130	4	20		
Manganese	ug/L	1660	1000	1000	2510	2620	86	96	70-130	4	20		
Potassium	ug/L	5050	10000	10000	14800	15000	97	100	70-130	2	20		
Sodium	ug/L	148000	10000	10000	172000	159000	240	117	70-130	7	20 M1		

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR
Pace Project No.: 60310790

QC Batch: 601955 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60310790011, 60310790012, 60310790013, 60310790014

METHOD BLANK: 2462496 Matrix: Water
Associated Lab Samples: 60310790011, 60310790012, 60310790013, 60310790014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<10.7	100	10.7	08/09/19 18:05	
Calcium	ug/L	86.6J	200	50.0	08/09/19 18:05	
Iron	ug/L	<14.0	50.0	14.0	08/09/19 18:05	
Magnesium	ug/L	16.8J	50.0	13.0	08/09/19 18:05	
Manganese	ug/L	<2.1	5.0	2.1	08/09/19 18:05	
Potassium	ug/L	94.0J	500	79.0	08/09/19 18:05	
Sodium	ug/L	<144	500	144	08/12/19 15:07	

LABORATORY CONTROL SAMPLE: 2462497

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	964	96	85-115	
Calcium	ug/L	10000	9980	100	85-115	
Iron	ug/L	10000	9500	95	85-115	
Magnesium	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	992	99	85-115	
Potassium	ug/L	10000	10200	102	85-115	
Sodium	ug/L	10000	10500	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2462498 2462499

Parameter	Units	60310792013		60310792022		60310792022		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Boron	ug/L	88.5J	1000	1000	1070	1000	99	91	70-130	7	20		
Calcium	ug/L	138000	10000	10000	158000	145000	208	73	70-130	9	20	M1	
Iron	ug/L	10300	10000	10000	20500	18900	102	85	70-130	8	20		
Magnesium	ug/L	42700	10000	10000	56000	51300	132	86	70-130	9	20	M1	
Manganese	ug/L	3480	1000	1000	4730	4350	125	87	70-130	8	20		
Potassium	ug/L	698	10000	10000	11000	10300	103	96	70-130	7	20		
Sodium	ug/L	8280	10000	10000	19200	17800	109	96	70-130	7	20		

MATRIX SPIKE SAMPLE: 2462500

Parameter	Units	60310792022 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	110	1000	1030	92	70-130	
Calcium	ug/L	120000	10000	126000	61	70-130	M1
Iron	ug/L	10400	10000	21900	116	70-130	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

MATRIX SPIKE SAMPLE:		2462500					
Parameter	Units	60310792022 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Magnesium	ug/L	32600	10000	41000	84	70-130	
Manganese	ug/L	637	1000	1540	90	70-130	
Potassium	ug/L	4270	10000	13600	93	70-130	
Sodium	ug/L	9550	10000	18800	92	70-130	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 603088 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60310790015

METHOD BLANK: 2466336 Matrix: Water

Associated Lab Samples: 60310790015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<10.7	100	10.7	08/15/19 13:11	
Calcium	ug/L	<50.0	200	50.0	08/15/19 13:11	
Iron	ug/L	<14.0	50.0	14.0	08/15/19 13:11	
Magnesium	ug/L	<13.0	50.0	13.0	08/15/19 13:11	
Manganese	ug/L	<2.1	5.0	2.1	08/15/19 13:11	
Potassium	ug/L	<79.0	500	79.0	08/15/19 13:11	
Sodium	ug/L	<144	500	144	08/15/19 13:11	

LABORATORY CONTROL SAMPLE: 2466337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	972	97	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Iron	ug/L	10000	10300	103	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	10000	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2466338 2466339

Parameter	Units	60311242002		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Boron	ug/L	ND	1000	1000	1010	1040	96	98	70-130	2	20	
Calcium	ug/L	29100	10000	10000	37400	37600	82	85	70-130	1	20	
Iron	ug/L	ND	10000	10000	9820	10000	98	100	70-130	2	20	
Magnesium	ug/L	3940	10000	10000	13400	13600	94	97	70-130	2	20	
Manganese	ug/L	ND	1000	1000	1000	1030	100	103	70-130	3	20	
Potassium	ug/L	16000	10000	10000	25000	25200	90	92	70-130	1	20	
Sodium	ug/L	132000	10000	10000	134000	133000	20	17	70-130	0	20 M1	

MATRIX SPIKE SAMPLE: 2466340

Parameter	Units	60311616003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	0.30 mg/L	1000	1310	101	70-130	
Calcium	ug/L	32.6 mg/L	10000	42400	98	70-130	
Iron	ug/L	1.5 mg/L	10000	11600	101	70-130	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

MATRIX SPIKE SAMPLE:		2466340					
Parameter	Units	60311616003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Magnesium	ug/L	12.2 mg/L	10000	21900	97	70-130	
Manganese	ug/L	0.051 mg/L	1000	1080	102	70-130	
Potassium	ug/L	14.6 mg/L	10000	25000	104	70-130	
Sodium	ug/L	101 mg/L	10000	112000	103	70-130	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 603364

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60310790001, 60310790002, 60310790003

METHOD BLANK: 2467297

Matrix: Water

Associated Lab Samples: 60310790001, 60310790002, 60310790003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	<6.5	20.0	6.5	08/15/19 10:55	

LABORATORY CONTROL SAMPLE: 2467298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	500	486	97	90-110	

SAMPLE DUPLICATE: 2467299

Parameter	Units	60310412023 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	277	296	7	10	

SAMPLE DUPLICATE: 2467300

Parameter	Units	60310791002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	186	187	0	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 603666

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790011, 60310790013

METHOD BLANK: 2468274

Matrix: Water

Associated Lab Samples: 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790011, 60310790013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	<6.5	20.0	6.5	08/17/19 14:48	

LABORATORY CONTROL SAMPLE: 2468275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	500	485	97	90-110	

SAMPLE DUPLICATE: 2468276

Parameter	Units	60310792004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	316	313	1	10	H1

SAMPLE DUPLICATE: 2468277

Parameter	Units	60310790007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	310	343	10	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 603918

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60310790004, 60310790010, 60310790012, 60310790014, 60310790015

METHOD BLANK: 2469620

Matrix: Water

Associated Lab Samples: 60310790004, 60310790010, 60310790012, 60310790014, 60310790015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	<6.5	20.0	6.5	08/19/19 14:58	

LABORATORY CONTROL SAMPLE: 2469621

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	500	487	97	90-110	

SAMPLE DUPLICATE: 2469622

Parameter	Units	60310790004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	248	257	4	10	

SAMPLE DUPLICATE: 2469623

Parameter	Units	60311820009 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	633	668	5	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 601524

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60310790002, 60310790003

METHOD BLANK: 2460999

Matrix: Water

Associated Lab Samples: 60310790002, 60310790003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/07/19 13:10	

LABORATORY CONTROL SAMPLE: 2461000

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 2461001

Parameter	Units	60310791002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	822	809	2	10	

SAMPLE DUPLICATE: 2461002

Parameter	Units	60310412023 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	545	600	10	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 601841

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60310790001

METHOD BLANK: 2462110

Matrix: Water

Associated Lab Samples: 60310790001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/08/19 11:54	

LABORATORY CONTROL SAMPLE: 2462111

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	980	98	80-120	

SAMPLE DUPLICATE: 2462112

Parameter	Units	60310791001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	282	288	2	10	

SAMPLE DUPLICATE: 2462113

Parameter	Units	60310792004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	660	717	8	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 602428

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790011, 60310790013

METHOD BLANK: 2464295

Matrix: Water

Associated Lab Samples: 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790011, 60310790013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/10/19 09:47	

LABORATORY CONTROL SAMPLE: 2464296

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

SAMPLE DUPLICATE: 2464297

Parameter	Units	60310940002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	49600	45400	9	10	

SAMPLE DUPLICATE: 2464299

Parameter	Units	60310790007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1870	1870	0	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 602605

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60310790004, 60310790010, 60310790012, 60310790014

METHOD BLANK: 2464881

Matrix: Water

Associated Lab Samples: 60310790004, 60310790010, 60310790012, 60310790014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/12/19 15:08	

LABORATORY CONTROL SAMPLE: 2464882

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

SAMPLE DUPLICATE: 2464883

Parameter	Units	60311128005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	10200	9980	2	10	

SAMPLE DUPLICATE: 2464884

Parameter	Units	60310792017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	481	490	2	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 603025

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60310790015

METHOD BLANK: 2466169

Matrix: Water

Associated Lab Samples: 60310790015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/14/19 10:57	

LABORATORY CONTROL SAMPLE: 2466170

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1100	110	80-120	

SAMPLE DUPLICATE: 2466171

Parameter	Units	60311486004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	374	392	5	10	

SAMPLE DUPLICATE: 2466172

Parameter	Units	60311344004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	634	663	4	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 603127 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60310790001, 60310790002, 60310790003

METHOD BLANK: 2466421 Matrix: Water

Associated Lab Samples: 60310790001, 60310790002, 60310790003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	08/14/19 11:57	
Fluoride	mg/L	<0.085	0.20	0.085	08/14/19 11:57	
Sulfate	mg/L	<0.23	1.0	0.23	08/14/19 11:57	

LABORATORY CONTROL SAMPLE: 2466422

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	5	4.7	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2466423 2466424

Parameter	Units	60310412023		60310412024		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	25.5	25	25	50.0	49.4	98	96	80-120	1	15		
Fluoride	mg/L	2.1	2.5	2.5	4.6	4.7	101	102	80-120	1	15		
Sulfate	mg/L	96.6	25	25	122	120	100	94	80-120	1	15	E	

MATRIX SPIKE SAMPLE: 2466425

Parameter	Units	60310952001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	46500	50000	99400	106	80-120	
Fluoride	mg/L	ND	25000	24700	99	80-120	
Sulfate	mg/L	21700	50000	73700	104	80-120	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch:	603862	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60310790004, 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790010, 60310790011, 60310790012, 60310790013, 60310790014		

METHOD BLANK:	2469461	Matrix:	Water
Associated Lab Samples:	60310790004, 60310790005, 60310790006, 60310790007, 60310790008, 60310790009, 60310790010, 60310790011, 60310790012, 60310790013, 60310790014		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	08/19/19 10:41	
Fluoride	mg/L	<0.085	0.20	0.085	08/19/19 10:41	
Sulfate	mg/L	<0.23	1.0	0.23	08/19/19 10:41	

LABORATORY CONTROL SAMPLE: 2469462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2469463 2469464

Parameter	Units	60310790007		2469464		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Chloride	mg/L	36.6	10	48.3	48.9	117	123	80-120	1	15	E,M1
Fluoride	mg/L	<0.085	2.5	2.3	2.3	92	94	80-120	2	15	
Sulfate	mg/L	930	500	1450	1450	104	105	80-120	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2469465 2469466

Parameter	Units	60310792013		2469466		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Chloride	mg/L	11.1	5	16.5	16.5	108	109	80-120	0	15	
Fluoride	mg/L	0.29	2.5	2.8	2.8	102	102	80-120	1	15	
Sulfate	mg/L	60.0	25	87.5	86.7	110	107	80-120	1	15	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 604620

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60310790015

METHOD BLANK: 2471616

Matrix: Water

Associated Lab Samples: 60310790015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	08/21/19 16:11	
Fluoride	mg/L	<0.085	0.20	0.085	08/21/19 16:11	
Sulfate	mg/L	<0.23	1.0	0.23	08/21/19 16:11	

LABORATORY CONTROL SAMPLE: 2471617

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	2.4	96	90-110	
Sulfate	mg/L	5	4.6	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2471618 2471619

Parameter	Units	60311382002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MS Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
Chloride	mg/L	137	50	50	196	199	117	124	80-120	2	15	M1			
Fluoride	mg/L	<2.0	25	25	25.3	25.5	96	97	80-120	1	15				
Sulfate	mg/L	217	100	100	313	311	95	93	80-120	1	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

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

QC Batch: 604760

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60310790005, 60310790006, 60310790012

METHOD BLANK: 2472155

Matrix: Water

Associated Lab Samples: 60310790005, 60310790006, 60310790012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	08/21/19 21:02	
Sulfate	mg/L	<0.23	1.0	0.23	08/21/19 21:02	

LABORATORY CONTROL SAMPLE: 2472156

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2472157 2472158

Parameter	Units	60310790005		2472157		2472158		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chloride	mg/L	36.1	250	250	250	296	284	95	90	80-120	4	15
Sulfate	mg/L	273	250	250	250	508	506	94	93	80-120	0	15

MATRIX SPIKE SAMPLE: 2472159

Parameter	Units	60312201005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	269	100	379	110	80-120	
Sulfate	mg/L	1440	500	1990	62	80-120 M1	

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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QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H1 Analysis conducted outside the EPA method holding time.

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60310790001	S-LMW-1S	EPA 200.7	601714	EPA 200.7	601738
60310790002	S-BMW-1S	EPA 200.7	601714	EPA 200.7	601738
60310790003	S-BMW-3S	EPA 200.7	601714	EPA 200.7	601738
60310790004	S-LMW-2S	EPA 200.7	601954	EPA 200.7	602073
60310790005	S-LMW-3S	EPA 200.7	601954	EPA 200.7	602073
60310790006	S-LMW-4S	EPA 200.7	601954	EPA 200.7	602073
60310790007	S-LMW-5S	EPA 200.7	601954	EPA 200.7	602073
60310790008	S-LMW-6S	EPA 200.7	601954	EPA 200.7	602073
60310790009	S-LMW-7S	EPA 200.7	601954	EPA 200.7	602073
60310790010	S-LMW-8S	EPA 200.7	601954	EPA 200.7	602073
60310790011	S-LMW-DUP-1	EPA 200.7	601955	EPA 200.7	602074
60310790012	S-LMW-DUP-2	EPA 200.7	601955	EPA 200.7	602074
60310790013	S-LMW-FB-1	EPA 200.7	601955	EPA 200.7	602074
60310790014	S-LMW-FB-2	EPA 200.7	601955	EPA 200.7	602074
60310790015	S-LMW-9S	EPA 200.7	603088	EPA 200.7	603144
60310790001	S-LMW-1S	SM 2320B	603364		
60310790002	S-BMW-1S	SM 2320B	603364		
60310790003	S-BMW-3S	SM 2320B	603364		
60310790004	S-LMW-2S	SM 2320B	603918		
60310790005	S-LMW-3S	SM 2320B	603666		
60310790006	S-LMW-4S	SM 2320B	603666		
60310790007	S-LMW-5S	SM 2320B	603666		
60310790008	S-LMW-6S	SM 2320B	603666		
60310790009	S-LMW-7S	SM 2320B	603666		
60310790010	S-LMW-8S	SM 2320B	603918		
60310790011	S-LMW-DUP-1	SM 2320B	603666		
60310790012	S-LMW-DUP-2	SM 2320B	603918		
60310790013	S-LMW-FB-1	SM 2320B	603666		
60310790014	S-LMW-FB-2	SM 2320B	603918		
60310790015	S-LMW-9S	SM 2320B	603918		
60310790001	S-LMW-1S	SM 2540C	601841		
60310790002	S-BMW-1S	SM 2540C	601524		
60310790003	S-BMW-3S	SM 2540C	601524		
60310790004	S-LMW-2S	SM 2540C	602605		
60310790005	S-LMW-3S	SM 2540C	602428		
60310790006	S-LMW-4S	SM 2540C	602428		
60310790007	S-LMW-5S	SM 2540C	602428		
60310790008	S-LMW-6S	SM 2540C	602428		
60310790009	S-LMW-7S	SM 2540C	602428		
60310790010	S-LMW-8S	SM 2540C	602605		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60310790

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60310790011	S-LMW-DUP-1	SM 2540C	602428		
60310790012	S-LMW-DUP-2	SM 2540C	602605		
60310790013	S-LMW-FB-1	SM 2540C	602428		
60310790014	S-LMW-FB-2	SM 2540C	602605		
60310790015	S-LMW-9S	SM 2540C	603025		
60310790001	S-LMW-1S	EPA 300.0	603127		
60310790002	S-BMW-1S	EPA 300.0	603127		
60310790003	S-BMW-3S	EPA 300.0	603127		
60310790004	S-LMW-2S	EPA 300.0	603862		
60310790005	S-LMW-3S	EPA 300.0	603862		
60310790005	S-LMW-3S	EPA 300.0	604760		
60310790006	S-LMW-4S	EPA 300.0	603862		
60310790006	S-LMW-4S	EPA 300.0	604760		
60310790007	S-LMW-5S	EPA 300.0	603862		
60310790008	S-LMW-6S	EPA 300.0	603862		
60310790009	S-LMW-7S	EPA 300.0	603862		
60310790010	S-LMW-8S	EPA 300.0	603862		
60310790011	S-LMW-DUP-1	EPA 300.0	603862		
60310790012	S-LMW-DUP-2	EPA 300.0	603862		
60310790012	S-LMW-DUP-2	EPA 300.0	604760		
60310790013	S-LMW-FB-1	EPA 300.0	603862		
60310790014	S-LMW-FB-2	EPA 300.0	603862		
60310790015	S-LMW-9S	EPA 300.0	604620		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60310790
Barcode with number 60310790

Client Name: Gorder

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: L-294 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.6, 2.0 Corr. Factor -1.0 Corrected 0.5, 1.0

Date and initials of person examining contents: 8/3/19

Temperature should be above freezing to 6°C

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes. Includes rows for Chain of Custody, Short Hold Time, Rush Turn Around Time, and various sample handling conditions.

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Jami Church Date: 8/8/19



CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information: Company: Golder Associates		Section B Required Project Information: Report To: Jeffrey Ingram		Section C Invoice Information: Attention:	
Address: 13515 Barrett Parkway Drive, Ste 260 Ballwin, MO 63021		Copy To: Ryan Feldmann/Eric Schneider		REGULATORY AGENCY <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Email To: jeffrey_ingram@golder.com		Purchase Order No.:		Site Location MO	
Phone: 636-724-9191 Fax: 636-724-9323		Project Name: Ameren Sioux Energy Center		STATE:	
Requested Due Date/TAT: Standard		Project Number: 153-1406-01.0003B (COC#6)			
Section D Required Client Information: Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOIL S SOLID SL WASTE W AIR A OTHER OT TANK T					
SAMPLE ID (A-Z, 0-9, /, -) Sample IDs MUST BE UNIQUE					

ITEM #	MATRIX CODE (see valid codes to left)	COLLECTED		DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATIVES	Analysis Test ↑ Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
		COMPOSITE START	COMPOSITE END/GRAB									
1	S-LMW-1S			8/21/11	1502							001
2	S-LMW-2S											
3	S-LMW-3S											
4	S-LMW-4S											
5	S-LMW-5S											
6	S-LMW-6S											
7	S-LMW-7S											
8	S-LMW-8S											
9	S-LMW-9S											
10	S-BMW-1S			8/11/11	1455							002
11	S-BMW-3S			8/11/11	1145							003
12	S-LMW-DUP-1											

ADDITIONAL COMMENTS *EPA 2007-B, Ca, Fe, Mg, Mn, K, Na				RELINQUISHED BY / AFFILIATION [Signature]	DATE 8/21/11 1635	ACCEPTED BY / AFFILIATION [Signature]	DATE 8/21/11 1635	RECEIVED ON <input checked="" type="checkbox"/> Ice (Y/N) <input checked="" type="checkbox"/> Cooler Sealed (Y/N) <input checked="" type="checkbox"/> Samples Intact (Y/N)
SAMPLER NAME AND SIGNATURE PRINT NAME of SAMPLER: Ryan Feldmann SIGNATURE of SAMPLER: [Signature]				DATE SIGNED (MM/DD/YYYY): 8/21/11				



Sample Condition Upon Receipt

WO#: 60310790



Client Name: Colder Assoc.

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other epic

Thermometer Used: J100 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.2 Corr. Factor +0.0 Corrected 0.2

Date and initials of person examining contents: 8-7-19/MS

Temperature should be above freezing to 6°C 0.6, 1.0, 0.3 0.6, 1.0, 0.3

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: Jamie Church Date: 8/8/19



CHAIN-OF-CUSTODY / Analytical Request Document

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

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

Section B
 Required Project Information:
 Report To: **Jeffrey Ingram**
 Copy To: **Ryan Feldmann/Eric Schneider**
 Purchase Order No.: _____
 Project Name: **Ameren Sioux Energy Center**
 Project Number: **153-1406-01.0003B (COC#6)**

Section C
 Invoice Information:
 Attention: _____
 Company Name: _____
 Address: _____
 Pace Quote Reference: _____
 Pace Project Manager: **Jamie Church**
 Pace Profile #: **9285**

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER

Site Location: _____ STATE: **MO**

Page: **1** of **2**

ITEM #	Valid Matrix Codes MATRIX CODE DW WT PRINKING WATER WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WP AR TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.												
		COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	DATE	TIME	DATE	TIME			Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus							
1	S-LMW-1S			G	WT	8/6/19	1030																		
2	S-LMW-2S			G	WT	8/5/19	1420																		
3	S-LMW-3S			G	WT	8/5/19	1450																		
4	S-LMW-4S			G	WT	8/5/19	1030																		
5	S-LMW-5S			G	WT	8/5/19	1135																		
6	S-LMW-6S			G	WT	8/5/19	1255																		
7	S-LMW-7S			G	WT	8/6/19	0925																		
8	S-LMW-8S			G	WT																				
9	S-LMW-9S			G	WT																				
10	S-BMW-1S			G	WT																				
11	S-BMW-3S			G	WT																				
12	S-LMW-DUP-1			G	WT	8/5/19																			

ADDITIONAL COMMENTS
 *EPA 200.7-B, Ca, Fe, Mg, Mn, K, Na

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: *Lucas Swindle*
 SIGNATURE of SAMPLER: *Lucas Swindle*
 DATE Signed (MM/DD/YYYY): **8/6/19**

Temp in °C: **0.6**, **1.0**, **0.3**

Received on Ice (Y/N): **Y**, **Y**, **Y**

Sealed Cooler (Y/N): **Y**, **Y**, **Y**

Samples Inlet (Y/N): **Y**, **Y**, **Y**



CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A
Required Client Information:
Company: **Golder Associates**

Address: **13515 Barrett Parkway Drive, Ste 260
Ballwin, MO 63021**

Email To: **jeffrey.ingram@golder.com**

Phone: **636-724-9191** Fax: **636-724-9323**

Requested Due Date/TAT: **Standard**

Section C
Invoice Information:
Attention: **Jeffrey Ingram**

Company Name: **Ryan Feldmann/Eric Schneider**

Address: **NPDES GROUND WATER RCRA DRINKING WATER OTHER DRINKING WATER**

Site Location: **MO**
STATE: **MO**

Project Name: **Ameren Sioux Energy Center**
Project Number: **153-1406-01.0003B (COC #6)**

Face Order Reference: **Jamie Church**

Face Project Manager: **9285**

Page: 2 of 2

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOL/SOLID SL OIL OL WP AR GS TS	Requested Client Information	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		PRESERVED	# OF CONTAINERS	ACCEPTED BY / AFFILIATION	DATE	TIME	DATE	TIME	Requested Analysis Filtered (Y/N)		Temp in °C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples In-lab (Y/N)
				COMPOSITE START	COMPOSITE END/GRAB								Metals*	Chloride/Fluoride/Sulfate				
1	S-LMW-DUP-2		WT G	8/6/19	-	H ₂ SO ₄ HCl NaOH Na ₂ O ₃ Methanol Other	3 2	Lucas/Swadey	8/6/19	1700	8/7/19	02550.0	Y	Y	Y	Y	Y	Y
2	S-LMW-FB-1		WT G	8/5/19	1408	Unpreserved	3 2	Lucas/Swadey	8/5/19	1700			Y	Y	Y	Y	Y	Y
3	S-LMW-FB-2		WT G	8/6/19	0812	Unpreserved	3 2	Lucas/Swadey	8/6/19	1700			Y	Y	Y	Y	Y	Y
4			WT G															
5			WT G															
6			WT G															
7			WT G															
8			WT G															
9			WT G															
10			WT G															
11			WT G															
12			WT G															

*EPA 200.7-B, Ca, Fe, Mn, K, Na

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: **Lucas Swadey**
 SIGNATURE of SAMPLER: *[Signature]*
 DATE Signed (MM/DD/YYYY): **8/6/19**



Sample Condition Upon Receipt

WO#: 60310790



Client Name: Golder

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: 2294 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 2.2 Corr. Factor 1.0 Corrected 1.2

Date and initials of person examining contents: 8/13/19

Temperature should be above freezing to 6°C

Chain of Custody present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: Jamie Chubb Date: 8/13/19

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:	Section B Required Project Information:	Section C Invoice Information:
Company: <u>Golden Associates</u>	Report To: <u>Jeffrey Ingram</u>	Attention:
Address: <u>13515 Barrett Parkway Dr Ste 200</u>	Copy To: <u>Ryan Feldmann / Eric Schneider</u>	Company Name:
<u>Baltimore, MD 21021</u>	Purchase Order No.:	Address:
Email To: <u>jeffrey-ingram@golder.com</u>	Project Name: <u>Ameren Sioux Energy Center</u>	Pace Quote Reference:
Phone: <u>636-724-9191</u> Fax: <u>636-724-9323</u>	Project Number: <u>153-140601.0003B</u>	Pace Project Manager: <u>Jamie Church</u>
Requested Due Date/TAT: <u>Standard</u>		Pace Profile #: <u>9285</u>

Page: 2013245 of

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER

Site Location: _____ STATE: _____

ITEM #	Section D Required Client Information	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Y/N	Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END					DATE	TIME		
1	S-LMWI-95	WT G	G	8/19/19	0935		32	1					00310790
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: <u>Mn, K, Na</u>	<u>Lucas Swindle / Golder</u>	<u>8/19/19</u>	<u>1311</u>	<u>Lucas Swindle</u>	<u>8/19/19</u>	<u>1700</u>	Received on <input type="checkbox"/> Sealed Cooler <input type="checkbox"/> Custody <input type="checkbox"/> Samples Intact <input type="checkbox"/>
	<u>Lucas Swindle</u>	<u>8/19/19</u>		<u>Lucas Swindle</u>	<u>8/19/19</u>		Temp in °C _____

ORIGINAL

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: Lucas Swindle
 SIGNATURE of SAMPLER: [Signature]

DATE Signed (MM/DD/YY): 8/19/19

MEMORANDUM**DATE** September 3, 2019**Project No.** 1531406**TO** Project File
Golder Associates**CC** Amanda Derhake, Jeff Ingram**FROM** Tommy Goodwin**EMAIL** Tommy_Goodwin@golder.com**DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPB – DATA PACKAGE 60310790A**

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren - Sioux - SCPB
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 1531406
 Validation Date: 9/3/2019

Laboratory: Pace Analytical - KS SDG #: 60310790A
 Analytical Method (type and no.): EPA 200.7 (Metals); SM 2320B (Alk); SM 2540C (TDS); EPA 300.0 (Anions)
 Matrix: Air Soil/Sed. Water Waste
 Sample Names S-LMW-1S, S-BMW-1S, S-BMW-3S, S-LMW-2S, S-LMW-3S, S-LMW-4S, S-LMW-5S, S-LMW-6S, S-LMW-7S, S-LMW-8S, S-LMW-9S
S-LMW-DUP-1, S-LMW-DUP-2, S-LMW-FB-1, S-LMW-FB-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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>8/1-8/9/2019</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (<u>grab</u> composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Sp.Cond, ORP, Temp, DO, Turb</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DUP-1 @ S-LMW-6S; DUP-2 @ S-LMW-2S
				FB-1 @ S-LMW-4S; FB-2 @ S-LMW-8S
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-90007: Alk, TDS; -90004: Alk;
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Comments/Notes:

MB: -90001-03: B (11.8); -90004-10: Ca (56.0), Mg (53.9), -90011-14: Ca (86.6), Mg (16.8), K (94.0)

FB-1: B (46.6), Ca (252), Mg (66.3), Na (229), TDS (20.0); FB-2: B (21.5), Mg (17.2), Na (148), TDS (6.0)

MS/MSD: -90007: Ca-MS (-18%), Na-MS (240%), Cl-MSD (123% and Exceeded Cal)

DUP-1: Fe (94), F (200); DUP-2: Fe (41); no qualification is necessary for DUP-2 samples.

Max Lab Duplicate RPD: 10% (Limit: 10%)

Dilution: Chloride and Sulfate were diluted in several samples; no qualification is necessary.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-BMW-1S	Boron (B)	100	U	Analyte Detected in Method Blank (MB); PQL>Result>MDL
S-BMW-3S	B	100	U	"
S-LMW-5S	Calcium (Ca)	277000	J	MS/MSD Exceeded Calibration Range
"	Sodium (Na)	148000	J	"
"	Chloride (Cl)	36.6	J	"
S-LMW-DUP-1	Iron (Fe)	72.9	J	Field Duplicate Exceeded RPD Limit; Result > MDL
"	Fluoride (F)	0.25	J	"
S-LMW-FB-2	Mg	50.0	U	Analyte Detected in Method Blank (MB); PQL>Result>MDL
S-LMW-6S	Fe	202	J	Field Duplicate Exceeded RPD Limit; Result > MDL

Signature: Tommy J. Good Jr.

Date: 9/3/2019

October 09, 2019

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

RE: Project: AMEREN SIOUX ENERGY CTR SCPB
Pace Project No.: 60316739

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on October 02, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 19-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60316739001	S-LMW-7S	Water	10/01/19 12:47	10/02/19 03:05
60316739002	S-LMW-FB-1	Water	10/01/19 12:52	10/02/19 03:05

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SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60316739001	S-LMW-7S	EPA 300.0	MGS	1	PASI-K
60316739002	S-LMW-FB-1	SM 2540C	MAP	1	PASI-K
		EPA 300.0	MGS	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

Sample: S-LMW-7S **Lab ID: 60316739001** Collected: 10/01/19 12:47 Received: 10/02/19 03:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Chloride	25.2	mg/L	2.0	0.44	2		10/07/19 21:33	16887-00-6	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

Sample: S-LMW-FB-1 **Lab ID: 60316739002** Collected: 10/01/19 12:52 Received: 10/02/19 03:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		10/04/19 16:33		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	<0.22	mg/L	1.0	0.22	1		10/04/19 21:05	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

QC Batch: 613627

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60316739002

METHOD BLANK: 2506053

Matrix: Water

Associated Lab Samples: 60316739002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	10/04/19 16:30	

LABORATORY CONTROL SAMPLE: 2506054

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

SAMPLE DUPLICATE: 2506055

Parameter	Units	60316736001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1250	1280	3	10	

SAMPLE DUPLICATE: 2506056

Parameter	Units	60316914012 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	6150	6760	9	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 SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

QC Batch: 613636

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60316739002

METHOD BLANK: 2506081

Matrix: Water

Associated Lab Samples: 60316739001, 60316739002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	10/04/19 11:02	

LABORATORY CONTROL SAMPLE: 2506082

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2506083 2506084

Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		60316718001 Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chloride	mg/L	151	50	50	208	177	115	52	80-120	16	15	E, M1, R1	

MATRIX SPIKE SAMPLE: 2506085

Parameter	Units	60316773003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	131	25	158	108	80-120	E

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

QC Batch: 613937	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60316739001	

METHOD BLANK: 2507245 Matrix: Water
Associated Lab Samples: 60316739001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	10/07/19 16:39	

LABORATORY CONTROL SAMPLE: 2507246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2507247 2507248

Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		60317056001	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chloride	mg/L	3.2J	25	25	25.1	25.2	88	88	80-120	1	15		

MATRIX SPIKE SAMPLE: 2507249

Parameter	Units	60316674006	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	4220	2000	6550	116	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

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

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60316739

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60316739002	S-LMW-FB-1	SM 2540C	613627		
60316739001	S-LMW-7S	EPA 300.0	613937		
60316739002	S-LMW-FB-1	EPA 300.0	613636		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt



Client Name: Golder Associates

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other 2PIC

Thermometer Used: T301 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.4 Corr. Factor 10.0 Corrected 1.4

Date and initials of person examining contents: VB 10/2/19

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

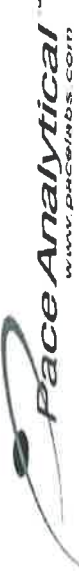
Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jamie Chubb Date: 10/3/19

CHAIN-OF-CUSTODY / Analytical Request Document

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



Section A Required Client Information: Company: Golder Associates		Section B Required Project Information: Report To: Jeffrey Ingram		Section C Invoice Information: Attention: _____	
Address: 13515 Barrett Parkway Drive, Ste 260 Ballwin, MO 63021		Copy To: Ryan Feldmann/Eric Schneider		REGULATORY AGENCY: NPDES <input checked="" type="checkbox"/> GROUND WATER UST <input type="checkbox"/> RCRA <input type="checkbox"/> DRINKING WATER OTHER <input type="checkbox"/>	
Email To: jeffrey_ingram@golder.com		Purchase Order No.: _____		Site Location: _____ MO _____	
Phone: 636-724-9191 Fax: 636-724-9323		Project Name: Ameren - S4B		Pace Quote Reference: Jamie Church	
Requested Due Date/TAT: Standard		Project Number: 153140601.0001B		Pace Profile #: 9285	

Page: 1 of 1

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOLIDS S OIL O SL VSP AR OT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		COMPOSITE START	COMPOSITE END/GRAB									
1	S-LMW-7S			G	WT	<i>Eric Schneider</i>	10/11/19	1738	<i>Eric Schneider</i>	10/21/19	0855	Y
2	S-LMW-FB-1			G	WT	<i>Eric Schneider</i>	10/11/19	1738	<i>Eric Schneider</i>	10/21/19	0855	Y
3				G	WT							
4				G	WT							
5				G	WT							
6				G	WT							
7				G	WT							
8				G	WT							
9				G	WT							
10				G	WT							
11				G	WT							
12				G	WT							
ADDITIONAL COMMENTS: _____												
Requested Analysis Filtered (Y/N): _____												
Preservatives: _____												
# OF CONTAINERS: _____												
Analysis Test: _____												
Residual Chlorine (Y/N): _____												
Pace Project No./ Lab I.D.: _____												

Temp in °C: _____		Received on Ice (Y/N): _____		Sealed Cooler (Y/N): _____		Samples Intact (Y/N): _____	
SAMPLER NAME AND SIGNATURE: _____				DATE Signed (MM/DD/YYYY): 10/10/19			
PRINT Name of SAMPLER: <i>Eric Schneider</i>				SIGNATURE of SAMPLER: <i>Eric Schneider</i>			



MEMORANDUM

DATE October 17, 2019

Project No. 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin

EMAIL Tommy_Goodwin@golder.com

DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPB – VERIFICATION SAMPLING - DATA PACKAGE 60316739

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: Golder Associates
 Project Name: Ameren - Sioux - SCPB - VS
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 1531406
 Validation Date: 10/17/2019

Laboratory: Pace Analytical - KS

SDG #: 60316739

Analytical Method (type and no.): EPA 300.0 (Anions); SM 2540C (TDS)

Matrix: Air Soil/Sed. Water Waste

Sample Names S-LMW-7S, S-LMW-FB-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>10/1/2019</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
e) Sample type indicated (<u>grab</u> /composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Sp.Cond, ORP, Temp, DO, Turb</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Note Deficiencies: _____				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	FB-1 @ S-LMW-7S _____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Comments/Notes:

Dilution: Chloride diluted in some samples; no qualification is necessary.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	
 	 	 	 	

Signature: Tommy J. Hood

Date: 10/17/2019

October 17, 2019

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

RE: Project: AMEREN SIOUX ENERGY CTR SCPB
Pace Project No.: 60317026

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on October 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 19-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60317026001	S-LMW-4S	Water	10/02/19 09:40	10/04/19 02:55
60317026002	S-LMW-DUP-1	Water	10/02/19 09:40	10/04/19 02:55

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60317026001	S-LMW-4S	SM 2540C	MAP	1	PASI-K
		EPA 300.0	MGS	1	PASI-K
60317026002	S-LMW-DUP-1	SM 2540C	MAP	1	PASI-K
		EPA 300.0	MGS	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

Sample: S-LMW-4S **Lab ID: 60317026001** Collected: 10/02/19 09:40 Received: 10/04/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	800	mg/L	10.0	10.0	1		10/08/19 10:38		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	22.1	mg/L	2.0	0.44	2		10/16/19 10:12	16887-00-6	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

Sample: S-LMW-DUP-1 **Lab ID: 60317026002** Collected: 10/02/19 09:40 Received: 10/04/19 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	815	mg/L	10.0	10.0	1		10/08/19 10:38		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	21.5	mg/L	2.0	0.44	2		10/15/19 16:55	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

QC Batch: 614056

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60317026001, 60317026002

METHOD BLANK: 2507578

Matrix: Water

Associated Lab Samples: 60317026001, 60317026002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	10/08/19 10:37	

LABORATORY CONTROL SAMPLE: 2507579

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

SAMPLE DUPLICATE: 2507581

Parameter	Units	60317050002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	310	318	2	10	

SAMPLE DUPLICATE: 2507585

Parameter	Units	60317050006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	706	721	2	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 SIOUX ENERGY CTR SCPB
Pace Project No.: 60317026

QC Batch: 614196 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60317026001, 60317026002

METHOD BLANK: 2508100 Matrix: Water
Associated Lab Samples: 60317026001, 60317026002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	10/15/19 15:08	

LABORATORY CONTROL SAMPLE: 2508101

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2508102 2508103

Parameter	Units	2508102		2508103		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60317026001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	22.1	10	10	34.2	32.5	121	105	80-120	5	15 M1

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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QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60317026

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60317026001	S-LMW-4S	SM 2540C	614056		
60317026002	S-LMW-DUP-1	SM 2540C	614056		
60317026001	S-LMW-4S	EPA 300.0	614196		
60317026002	S-LMW-DUP-1	EPA 300.0	614196		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60317026



Client Name: Golder Associates

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other zplc

Thermometer Used: T-301 Type of Ice: (Wet) Blue None

Cooler Temperature (°C): As-read 0.1 Corr. Factor +0.0 Corrected 0.1

Date and initials of person examining contents: 10-4-19 HS

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: Jamie Chung _____ Date: 10/8/19



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:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260 Ballwin, MO 63021	Copy To:	Ryan Feldmann/Eric Schneider	Company Name:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Address:	
Phone:	636-724-9191	Project Name:	Ameren SCPB	Site Location:	RCRA
Requested Due Date/TAT:	Standard	Project Number:	153140601-0003	State:	MO
				NPDES:	SEWIND WATER
				UST:	
				OTHER:	

Page: 1 of 1

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WWT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WP CW TS	Requested Client Information	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
			DATE	TIME						
1	S-LMW-45		10-2-19	10:40		1	Unpreserved	N		001
2	S-LMW-Dup-1		10-2-19	10:40		1	Unpreserved	N		002
3								N		
4								N		
5								N		
6								N		
7								N		
8								N		
9								N		
10								N		
11								N		
12								N		

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
Annie McManus (Golder)	10-2-19	13:33	Annie McManus	10/13/19	13:34	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)
Annie McManus (Golder)	10/13/19		E Bralott Pace	10/14/19	02:55	Y	Y	Y
Camela McManus	10/13/19	13:35						

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: Annie McManus
 SIGNATURE of SAMPLER: Annie McManus
 DATE Signed (MM/DD/YYYY): 10/12/19



GOLDER

MEMORANDUM

DATE January 8, 2020

Project No. 153140601

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin

EMAIL Tommy_Goodwin@golder.com

DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPB - DATA PACKAGE 60317026

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

- When MS/MSD recovery exceeded the QC limits, the associated sample result was qualified as an estimate (J).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren - Sioux - SCPB
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 153140601
 Validation Date: 1/8/2020

Laboratory: Pace Analytical - KS

SDG #: 60317026

Analytical Method (type and no.): SM 2540C (TDS); EPA 300.0 (Anions)

Matrix: Air Soil/Sed. Water Waste

Sample Names S-LMW-4S, S-LMW-DUP-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>10/2/2019</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (<u>grab</u> composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Sp.Cond, ORP, Temp, DO, Turb</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DUP-1 @ S-LMW-4S _____
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes _____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Notes _____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Comments/Notes:

MS: -01 Chloride MS %Rec High

Max Field Duplicate RPD: 3% (Limit 20%)

Dilution: Chloride diluted in both samples; no qualification is necessary.

December 03, 2019

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

RE: Project: AMEREN SIOUX ENERGY CTR SCPB
Pace Project No.: 60321513

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on November 16, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Inorganic Drinking Water Certification #: 10090

Arkansas Drinking Water

Arkansas Certification #: 19-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212020-2

Oklahoma Certification #: 9205/9935

Florida: Cert E871149 SEKS WET

Texas Certification #: T104704407-19-12

Utah Certification #: KS000212018-8

Illinois Certification #: 004592

Kansas Field Laboratory Accreditation: # E-92587

Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60321513001	S-LMW-1S	Water	11/15/19 13:14	11/16/19 02:35
60321513002	S-LMW-2S	Water	11/15/19 14:05	11/16/19 02:35
60321513003	S-LMW-3S	Water	11/15/19 11:05	11/16/19 02:35
60321513004	S-LMW-4S	Water	11/15/19 12:04	11/16/19 02:35
60321513005	S-LMW-5S	Water	11/15/19 10:52	11/16/19 02:35
60321513006	S-LMW-6S	Water	11/15/19 11:48	11/16/19 02:35
60321513007	S-LMW-7S	Water	11/15/19 12:31	11/16/19 02:35
60321513008	S-LMW-8S	Water	11/15/19 13:31	11/16/19 02:35
60321513009	S-LMW-9S	Water	11/15/19 14:18	11/16/19 02:35
60321513010	S-BMW-1S	Water	11/15/19 14:43	11/16/19 02:35
60321513011	S-BMW-3S	Water	11/15/19 12:18	11/16/19 02:35
60321513012	S-LMW-DUP-1	Water	11/15/19 12:18	11/16/19 02:35
60321513013	S-LMW-DUP-2	Water	11/15/19 12:18	11/16/19 02:35
60321513014	S-LMW-FB-1	Water	11/15/19 11:40	11/16/19 02:35
60321513015	S-LMW-FB-2	Water	11/15/19 13:20	11/16/19 02:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60321513001	S-LMW-1S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321513002	S-LMW-2S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321513003	S-LMW-3S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321513004	S-LMW-4S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321513005	S-LMW-5S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321513006	S-LMW-6S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB, MGS	3	PASI-K
60321513007	S-LMW-7S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB, MGS	3	PASI-K
60321513008	S-LMW-8S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB, MGS	3	PASI-K
60321513009	S-LMW-9S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB, MGS	3	PASI-K
60321513010	S-BMW-1S	EPA 200.7	HKC	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60321513011	S-BMW-3S	SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
60321513012	S-LMW-DUP-1	SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
60321513013	S-LMW-DUP-2	EPA 300.0	CNB, MGS	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321513014	S-LMW-FB-1	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
60321513015	S-LMW-FB-2	SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
		EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-1S **Lab ID: 60321513001** Collected: 11/15/19 13:14 Received: 11/16/19 02:35 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							
Boron	1270	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 17:44	7440-42-8	
Calcium	79400	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 17:44	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 17:44	7439-89-6	
Magnesium	21200	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 17:44	7439-95-4	
Manganese	84.3	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 17:44	7439-96-5	
Potassium	6620	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 17:44	7440-09-7	
Sodium	18100	ug/L	500	144	1	11/26/19 09:12	11/26/19 17:44	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	246	mg/L	20.0	6.5	1		11/25/19 12:36		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	386	mg/L	5.0	5.0	1		11/22/19 08:53		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	18.2	mg/L	1.0	0.22	1		11/27/19 10:49	16887-00-6	
Fluoride	0.29	mg/L	0.20	0.085	1		11/27/19 10:49	16984-48-8	
Sulfate	70.2	mg/L	10.0	2.3	10		11/29/19 21:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-2S **Lab ID: 60321513002** Collected: 11/15/19 14:05 Received: 11/16/19 02:35 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							
Boron	11200	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 17:46	7440-42-8	M1
Calcium	170000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 17:46	7440-70-2	M1
Iron	69.8	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 17:46	7439-89-6	B
Magnesium	29800	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 17:46	7439-95-4	
Manganese	404	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 17:46	7439-96-5	
Potassium	7710	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 17:46	7440-09-7	
Sodium	67100	ug/L	500	144	1	11/26/19 09:12	11/26/19 17:46	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	277	mg/L	20.0	6.5	1		11/25/19 12:41		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	927	mg/L	10.0	10.0	1		11/22/19 08:53		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	102	mg/L	20.0	4.4	20		11/27/19 12:08	16887-00-6	
Fluoride	0.31	mg/L	0.20	0.085	1		11/27/19 12:56	16984-48-8	
Sulfate	317	mg/L	50.0	11.5	50		11/29/19 21:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-3S **Lab ID: 60321513003** Collected: 11/15/19 11:05 Received: 11/16/19 02:35 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							
Boron	961	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 17:57	7440-42-8	
Calcium	165000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 17:57	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 17:57	7439-89-6	
Magnesium	34100	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 17:57	7439-95-4	
Manganese	193	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 17:57	7439-96-5	
Potassium	5620	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 17:57	7440-09-7	
Sodium	40200	ug/L	500	144	1	11/26/19 09:12	11/26/19 17:57	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	310	mg/L	20.0	6.5	1		11/25/19 12:52		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	798	mg/L	10.0	10.0	1		11/22/19 08:53		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	66.3	mg/L	5.0	1.1	5		11/27/19 13:59	16887-00-6	
Fluoride	0.26	mg/L	0.20	0.085	1		11/27/19 13:43	16984-48-8	
Sulfate	238	mg/L	50.0	11.5	50		11/29/19 22:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-4S **Lab ID: 60321513004** Collected: 11/15/19 12:04 Received: 11/16/19 02:35 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							
Boron	4290	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 17:59	7440-42-8	
Calcium	180000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 17:59	7440-70-2	
Iron	16.4J	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 17:59	7439-89-6	B
Magnesium	39500	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 17:59	7439-95-4	
Manganese	542	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 17:59	7439-96-5	
Potassium	4850	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 17:59	7440-09-7	
Sodium	19500	ug/L	500	144	1	11/26/19 09:12	11/26/19 17:59	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	460	mg/L	20.0	6.5	1		11/25/19 12:58		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	816	mg/L	10.0	10.0	1		11/22/19 08:53		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	23.0	mg/L	5.0	1.1	5		11/27/19 15:02	16887-00-6	
Fluoride	0.16J	mg/L	0.20	0.085	1		11/27/19 14:46	16984-48-8	
Sulfate	170	mg/L	20.0	4.6	20		11/29/19 22:28	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-5S **Lab ID: 60321513005** Collected: 11/15/19 10:52 Received: 11/16/19 02:35 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							
Boron	14900	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:02	7440-42-8	
Calcium	266000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:02	7440-70-2	
Iron	193	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:02	7439-89-6	B
Magnesium	56000	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:02	7439-95-4	
Manganese	1610	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:02	7439-96-5	
Potassium	4760	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:02	7440-09-7	
Sodium	142000	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:02	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	342	mg/L	20.0	6.5	1		11/25/19 13:04		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1770	mg/L	13.3	13.3	1		11/22/19 08:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	31.0	mg/L	2.0	0.44	2		11/29/19 22:44	16887-00-6	
Fluoride	0.39	mg/L	0.20	0.085	1		11/27/19 15:18	16984-48-8	
Sulfate	852	mg/L	100	23.0	100		11/29/19 22:59	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-6S **Lab ID: 60321513006** Collected: 11/15/19 11:48 Received: 11/16/19 02:35 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							
Boron	19300	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:04	7440-42-8	
Calcium	292000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:04	7440-70-2	
Iron	132	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:04	7439-89-6	B
Magnesium	72500	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:04	7439-95-4	
Manganese	603	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:04	7439-96-5	
Potassium	5220	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:04	7440-09-7	
Sodium	110000	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:04	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	368	mg/L	20.0	6.5	1		11/25/19 13:09		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1870	mg/L	13.3	13.3	1		11/22/19 08:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	4.1	mg/L	1.0	0.22	1		11/27/19 16:05	16887-00-6	
Fluoride	0.21	mg/L	0.20	0.085	1		11/27/19 16:05	16984-48-8	
Sulfate	917	mg/L	100	23.0	100		12/02/19 13:57	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-7S **Lab ID: 60321513007** Collected: 11/15/19 12:31 Received: 11/16/19 02:35 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							
Boron	4830	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:06	7440-42-8	
Calcium	208000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:06	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:06	7439-89-6	
Magnesium	61800	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:06	7439-95-4	
Manganese	588	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:06	7439-96-5	
Potassium	4650	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:06	7440-09-7	
Sodium	35500	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:06	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	413	mg/L	20.0	6.5	1		11/25/19 13:16		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1140	mg/L	13.3	13.3	1		11/22/19 08:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	28.0	mg/L	2.0	0.44	2		12/02/19 13:07	16887-00-6	
Fluoride	0.21	mg/L	0.20	0.085	1		11/27/19 16:53	16984-48-8	
Sulfate	402	mg/L	50.0	11.5	50		11/30/19 00:03	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-8S **Lab ID: 60321513008** Collected: 11/15/19 13:31 Received: 11/16/19 02:35 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							
Boron	8590	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:08	7440-42-8	
Calcium	153000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:08	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:08	7439-89-6	
Magnesium	40100	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:08	7439-95-4	
Manganese	432	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:08	7439-96-5	
Potassium	4400	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:08	7440-09-7	
Sodium	60200	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:08	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	262	mg/L	20.0	6.5	1		11/25/19 13:21		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	922	mg/L	10.0	10.0	1		11/22/19 08:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	36.2	mg/L	5.0	1.1	5		11/27/19 18:12	16887-00-6	
Fluoride	0.83	mg/L	0.20	0.085	1		11/27/19 17:56	16984-48-8	
Sulfate	399	mg/L	50.0	11.5	50		12/02/19 13:40	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-9S **Lab ID: 60321513009** Collected: 11/15/19 14:18 Received: 11/16/19 02:35 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							
Boron	1640	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:11	7440-42-8	
Calcium	189000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:11	7440-70-2	
Iron	75.5	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:11	7439-89-6	B
Magnesium	70300	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:11	7439-95-4	
Manganese	446	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:11	7439-96-5	
Potassium	4350	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:11	7440-09-7	
Sodium	48600	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:11	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	480	mg/L	20.0	6.5	1		11/25/19 13:28		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1110	mg/L	13.3	13.3	1		11/22/19 08:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	77.2	mg/L	10.0	2.2	10		11/27/19 19:00	16887-00-6	
Fluoride	0.27	mg/L	0.20	0.085	1		11/27/19 19:16	16984-48-8	
Sulfate	287	mg/L	50.0	11.5	50		12/02/19 14:14	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-BMW-1S **Lab ID: 60321513010** Collected: 11/15/19 14:43 Received: 11/16/19 02:35 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							
Boron	118	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:13	7440-42-8	
Calcium	143000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:13	7440-70-2	M1
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:13	7439-89-6	
Magnesium	29700	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:13	7439-95-4	
Manganese	426	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:13	7439-96-5	
Potassium	424J	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:13	7440-09-7	
Sodium	5360	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:13	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	428	mg/L	20.0	6.5	1		11/25/19 15:41		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	551	mg/L	10.0	10.0	1		11/22/19 08:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	6.4	mg/L	1.0	0.22	1		11/27/19 19:32	16887-00-6	
Fluoride	0.28	mg/L	0.20	0.085	1		11/27/19 19:32	16984-48-8	
Sulfate	26.5	mg/L	2.0	0.46	2		11/30/19 01:38	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-BMW-3S **Lab ID: 60321513011** Collected: 11/15/19 12:18 Received: 11/16/19 02:35 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							
Boron	80.1J	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:17	7440-42-8	
Calcium	102000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:17	7440-70-2	
Iron	6800	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:17	7439-89-6	
Magnesium	25600	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:17	7439-95-4	
Manganese	519	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:17	7439-96-5	
Potassium	3840	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:17	7440-09-7	
Sodium	6610	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:17	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO ₃	342	mg/L	20.0	6.5	1		11/25/19 15:52		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	418	mg/L	5.0	5.0	1		11/22/19 08:54		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	7.6	mg/L	1.0	0.22	1		11/27/19 21:07	16887-00-6	
Fluoride	0.23	mg/L	0.20	0.085	1		11/27/19 21:07	16984-48-8	
Sulfate	34.4	mg/L	2.0	0.46	2		11/27/19 21:23	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-DUP-1 **Lab ID: 60321513012** Collected: 11/15/19 12:18 Received: 11/16/19 02:35 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							
Boron	875	ug/L	100	10.7	1	11/26/19 09:12	11/27/19 15:38	7440-42-8	
Calcium	173000	ug/L	200	50.0	1	11/26/19 09:12	11/27/19 15:38	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/27/19 15:38	7439-89-6	
Magnesium	33300	ug/L	50.0	13.0	1	11/26/19 09:12	11/27/19 15:38	7439-95-4	
Manganese	181	ug/L	5.0	2.1	1	11/26/19 09:12	11/27/19 15:38	7439-96-5	
Potassium	5600	ug/L	500	79.0	1	11/26/19 09:12	11/27/19 15:38	7440-09-7	
Sodium	38900	ug/L	500	144	1	11/26/19 09:12	11/27/19 15:38	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	303	mg/L	20.0	6.5	1		11/25/19 15:57		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	779	mg/L	10.0	10.0	1		11/22/19 11:14		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	62.4	mg/L	5.0	1.1	5		12/02/19 13:24	16887-00-6	
Fluoride	0.25	mg/L	0.20	0.085	1		11/27/19 21:38	16984-48-8	
Sulfate	234	mg/L	50.0	11.5	50		11/27/19 21:54	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-DUP-2 **Lab ID: 60321513013** Collected: 11/15/19 12:18 Received: 11/16/19 02:35 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							
Boron	4130	ug/L	100	10.7	1	11/26/19 09:12	11/27/19 15:35	7440-42-8	
Calcium	199000	ug/L	200	50.0	1	11/26/19 09:12	11/27/19 16:15	7440-70-2	
Iron	58.2	ug/L	50.0	14.0	1	11/26/19 09:12	11/27/19 15:35	7439-89-6	B
Magnesium	40100	ug/L	50.0	13.0	1	11/26/19 09:12	11/27/19 15:35	7439-95-4	
Manganese	535	ug/L	5.0	2.1	1	11/26/19 09:12	11/27/19 15:35	7439-96-5	
Potassium	4990	ug/L	500	79.0	1	11/26/19 09:12	11/27/19 15:35	7440-09-7	
Sodium	19800	ug/L	500	144	1	11/26/19 09:12	11/27/19 16:15	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	468	mg/L	20.0	6.5	1		11/25/19 16:04		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	832	mg/L	10.0	10.0	1		11/22/19 11:14		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	23.4	mg/L	2.0	0.44	2		11/27/19 22:42	16887-00-6	
Fluoride	0.13J	mg/L	0.20	0.085	1		11/27/19 22:26	16984-48-8	
Sulfate	166	mg/L	50.0	11.5	50		11/27/19 22:58	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-FB-1 **Lab ID: 60321513014** Collected: 11/15/19 11:40 Received: 11/16/19 02:35 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							
Boron	<10.7	ug/L	100	10.7	1	11/26/19 09:12	11/27/19 15:40	7440-42-8	
Calcium	67.7J	ug/L	200	50.0	1	11/26/19 09:12	11/27/19 15:40	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/27/19 15:40	7439-89-6	
Magnesium	<13.0	ug/L	50.0	13.0	1	11/26/19 09:12	11/27/19 15:40	7439-95-4	
Manganese	<2.1	ug/L	5.0	2.1	1	11/26/19 09:12	11/27/19 15:40	7439-96-5	
Potassium	<79.0	ug/L	500	79.0	1	11/26/19 09:12	11/27/19 15:40	7440-09-7	
Sodium	<144	ug/L	500	144	1	11/26/19 09:12	11/27/19 15:40	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<6.5	mg/L	20.0	6.5	1		11/25/19 16:09		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		11/22/19 11:14		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.22	mg/L	1.0	0.22	1		11/27/19 23:14	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		11/27/19 23:14	16984-48-8	
Sulfate	<0.23	mg/L	1.0	0.23	1		11/27/19 23:14	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Sample: S-LMW-FB-2 **Lab ID: 60321513015** Collected: 11/15/19 13:20 Received: 11/16/19 02:35 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							
Boron	<10.7	ug/L	100	10.7	1	11/26/19 09:12	11/27/19 15:42	7440-42-8	
Calcium	<50.0	ug/L	200	50.0	1	11/26/19 09:12	11/27/19 15:42	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/27/19 15:42	7439-89-6	
Magnesium	<13.0	ug/L	50.0	13.0	1	11/26/19 09:12	11/27/19 15:42	7439-95-4	
Manganese	<2.1	ug/L	5.0	2.1	1	11/26/19 09:12	11/27/19 15:42	7439-96-5	
Potassium	<79.0	ug/L	500	79.0	1	11/26/19 09:12	11/27/19 15:42	7440-09-7	
Sodium	<144	ug/L	500	144	1	11/26/19 09:12	11/27/19 15:42	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<6.5	mg/L	20.0	6.5	1		11/25/19 16:12		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		11/22/19 11:14		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.22	mg/L	1.0	0.22	1		11/27/19 23:29	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		11/27/19 23:29	16984-48-8	
Sulfate	<0.23	mg/L	1.0	0.23	1		11/27/19 23:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

QC Batch:	624736	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015		

METHOD BLANK:	2547231	Matrix:	Water
Associated Lab Samples:	60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<10.7	100	10.7	11/26/19 17:42	
Calcium	ug/L	<50.0	200	50.0	11/26/19 17:42	
Iron	ug/L	21.5J	50.0	14.0	11/26/19 17:42	
Magnesium	ug/L	<13.0	50.0	13.0	11/26/19 17:42	
Manganese	ug/L	<2.1	5.0	2.1	11/26/19 17:42	
Potassium	ug/L	<79.0	500	79.0	11/26/19 17:42	
Sodium	ug/L	<144	500	144	11/26/19 17:42	

LABORATORY CONTROL SAMPLE: 2547232

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1030	103	85-115	
Calcium	ug/L	10000	9320	93	85-115	
Iron	ug/L	10000	9140	91	85-115	
Magnesium	ug/L	10000	9890	99	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	9900	99	85-115	
Sodium	ug/L	10000	9950	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547233 2547234

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Boron	ug/L	1000	11200	1000	12600	132	144	70-130	1	20	M1
Calcium	ug/L	10000	170000	10000	182000	127	140	70-130	1	20	M1
Iron	ug/L	10000	69.8	10000	9170	91	93	70-130	2	20	
Magnesium	ug/L	10000	29800	10000	40000	102	104	70-130	0	20	
Manganese	ug/L	1000	404	1000	1410	101	102	70-130	1	20	
Potassium	ug/L	10000	7710	10000	17900	102	103	70-130	1	20	
Sodium	ug/L	10000	67100	10000	78300	112	116	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

MATRIX SPIKE SAMPLE: 2547235		60321513010	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	118	1000	1140	102	70-130	
Calcium	ug/L	143000	10000	146000	26	70-130	M1
Iron	ug/L	<14.0	10000	8880	89	70-130	
Magnesium	ug/L	29700	10000	38000	83	70-130	
Manganese	ug/L	426	1000	1400	97	70-130	
Potassium	ug/L	424J	10000	10200	98	70-130	
Sodium	ug/L	5360	10000	14900	96	70-130	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

QC Batch:	624469	Analysis Method:	SM 2320B
QC Batch Method:	SM 2320B	Analysis Description:	2320B Alkalinity
Associated Lab Samples:	60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009		

METHOD BLANK:	2546433	Matrix:	Water
Associated Lab Samples:	60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	11/25/19 10:54	

LABORATORY CONTROL SAMPLE: 2546434

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	495	99	90-110	

SAMPLE DUPLICATE: 2546435

Parameter	Units	60321436001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	938	987	5	10	

SAMPLE DUPLICATE: 2546437

Parameter	Units	60321513002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	277	281	1	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

QC Batch: 624580 Analysis Method: SM 2320B
 QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
 Associated Lab Samples: 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015

METHOD BLANK: 2546893 Matrix: Water
 Associated Lab Samples: 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20.0	6.5	11/25/19 15:29	

LABORATORY CONTROL SAMPLE: 2546894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	488	98	90-110	

SAMPLE DUPLICATE: 2546895

Parameter	Units	60321513010 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	428	429	0	10	

SAMPLE DUPLICATE: 2546897

Parameter	Units	60321518006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	381	406	6	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

QC Batch: 624081 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011

METHOD BLANK: 2544812 Matrix: Water
 Associated Lab Samples: 60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/22/19 08:51	

LABORATORY CONTROL SAMPLE: 2544813

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

SAMPLE DUPLICATE: 2544814

Parameter	Units	60321433002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2440	2470	1	10	

SAMPLE DUPLICATE: 2544815

Parameter	Units	60321513002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	927	959	3	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

QC Batch: 624082

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60321513012, 60321513013, 60321513014, 60321513015

METHOD BLANK: 2544816

Matrix: Water

Associated Lab Samples: 60321513012, 60321513013, 60321513014, 60321513015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/22/19 11:13	

LABORATORY CONTROL SAMPLE: 2544817

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	964	96	80-120	

SAMPLE DUPLICATE: 2544818

Parameter	Units	60321513012 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	779	854	9	10	

SAMPLE DUPLICATE: 2544819

Parameter	Units	60321518006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	628	643	2	10	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

QC Batch: 625047 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015

METHOD BLANK: 2548479 Matrix: Water

Associated Lab Samples: 60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	11/27/19 10:18	
Fluoride	mg/L	<0.085	0.20	0.085	11/27/19 10:18	
Sulfate	mg/L	<0.23	1.0	0.23	11/27/19 10:18	

METHOD BLANK: 2550027 Matrix: Water

Associated Lab Samples: 60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	11/29/19 20:37	
Fluoride	mg/L	<0.085	0.20	0.085	11/29/19 20:37	
Sulfate	mg/L	<0.23	1.0	0.23	11/29/19 20:37	

METHOD BLANK: 2550207 Matrix: Water

Associated Lab Samples: 60321513001, 60321513002, 60321513003, 60321513004, 60321513005, 60321513006, 60321513007, 60321513008, 60321513009, 60321513010, 60321513011, 60321513012, 60321513013, 60321513014, 60321513015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.22	1.0	0.22	12/02/19 09:31	
Fluoride	mg/L	<0.085	0.20	0.085	12/02/19 09:31	
Sulfate	mg/L	<0.23	1.0	0.23	12/02/19 09:31	

LABORATORY CONTROL SAMPLE: 2548480

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	4.5	90	90-110	

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QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

LABORATORY CONTROL SAMPLE: 2550028

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	2.4	95	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

LABORATORY CONTROL SAMPLE: 2550208

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2548481 2548482

Parameter	Units	60321513002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Chloride	mg/L	102	100	100	100	218	210	116	108	80-120	4	15			
Fluoride	mg/L	0.31	2.5	2.5	2.5	3.1	3.1	110	112	80-120	1	15			
Sulfate	mg/L	317	250	250	250	568	565	100	99	80-120	0	15			

MATRIX SPIKE SAMPLE: 2548483

Parameter	Units	60321513010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	6.4	5	11.6	103	80-120	
Fluoride	mg/L	0.28	2.5	3.0	110	80-120	
Sulfate	mg/L	26.5	10	37.2	107	80-120	

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QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

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 SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60321513001	S-LMW-1S	EPA 200.7	624736	EPA 200.7	624858
60321513002	S-LMW-2S	EPA 200.7	624736	EPA 200.7	624858
60321513003	S-LMW-3S	EPA 200.7	624736	EPA 200.7	624858
60321513004	S-LMW-4S	EPA 200.7	624736	EPA 200.7	624858
60321513005	S-LMW-5S	EPA 200.7	624736	EPA 200.7	624858
60321513006	S-LMW-6S	EPA 200.7	624736	EPA 200.7	624858
60321513007	S-LMW-7S	EPA 200.7	624736	EPA 200.7	624858
60321513008	S-LMW-8S	EPA 200.7	624736	EPA 200.7	624858
60321513009	S-LMW-9S	EPA 200.7	624736	EPA 200.7	624858
60321513010	S-BMW-1S	EPA 200.7	624736	EPA 200.7	624858
60321513011	S-BMW-3S	EPA 200.7	624736	EPA 200.7	624858
60321513012	S-LMW-DUP-1	EPA 200.7	624736	EPA 200.7	624858
60321513013	S-LMW-DUP-2	EPA 200.7	624736	EPA 200.7	624858
60321513014	S-LMW-FB-1	EPA 200.7	624736	EPA 200.7	624858
60321513015	S-LMW-FB-2	EPA 200.7	624736	EPA 200.7	624858
60321513001	S-LMW-1S	SM 2320B	624469		
60321513002	S-LMW-2S	SM 2320B	624469		
60321513003	S-LMW-3S	SM 2320B	624469		
60321513004	S-LMW-4S	SM 2320B	624469		
60321513005	S-LMW-5S	SM 2320B	624469		
60321513006	S-LMW-6S	SM 2320B	624469		
60321513007	S-LMW-7S	SM 2320B	624469		
60321513008	S-LMW-8S	SM 2320B	624469		
60321513009	S-LMW-9S	SM 2320B	624469		
60321513010	S-BMW-1S	SM 2320B	624580		
60321513011	S-BMW-3S	SM 2320B	624580		
60321513012	S-LMW-DUP-1	SM 2320B	624580		
60321513013	S-LMW-DUP-2	SM 2320B	624580		
60321513014	S-LMW-FB-1	SM 2320B	624580		
60321513015	S-LMW-FB-2	SM 2320B	624580		
60321513001	S-LMW-1S	SM 2540C	624081		
60321513002	S-LMW-2S	SM 2540C	624081		
60321513003	S-LMW-3S	SM 2540C	624081		
60321513004	S-LMW-4S	SM 2540C	624081		
60321513005	S-LMW-5S	SM 2540C	624081		
60321513006	S-LMW-6S	SM 2540C	624081		
60321513007	S-LMW-7S	SM 2540C	624081		
60321513008	S-LMW-8S	SM 2540C	624081		
60321513009	S-LMW-9S	SM 2540C	624081		
60321513010	S-BMW-1S	SM 2540C	624081		
60321513011	S-BMW-3S	SM 2540C	624081		
60321513012	S-LMW-DUP-1	SM 2540C	624082		
60321513013	S-LMW-DUP-2	SM 2540C	624082		
60321513014	S-LMW-FB-1	SM 2540C	624082		
60321513015	S-LMW-FB-2	SM 2540C	624082		
60321513001	S-LMW-1S	EPA 300.0	625047		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR SCPB

Pace Project No.: 60321513

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60321513002	S-LMW-2S	EPA 300.0	625047		
60321513003	S-LMW-3S	EPA 300.0	625047		
60321513004	S-LMW-4S	EPA 300.0	625047		
60321513005	S-LMW-5S	EPA 300.0	625047		
60321513006	S-LMW-6S	EPA 300.0	625047		
60321513007	S-LMW-7S	EPA 300.0	625047		
60321513008	S-LMW-8S	EPA 300.0	625047		
60321513009	S-LMW-9S	EPA 300.0	625047		
60321513010	S-BMW-1S	EPA 300.0	625047		
60321513011	S-BMW-3S	EPA 300.0	625047		
60321513012	S-LMW-DUP-1	EPA 300.0	625047		
60321513013	S-LMW-DUP-2	EPA 300.0	625047		
60321513014	S-LMW-FB-1	EPA 300.0	625047		
60321513015	S-LMW-FB-2	EPA 300.0	625047		

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Sample Condition Upon Receipt

WO#: 60321513

 60321513

Client Name: Golden

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-277 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 2.8, 2.3 Corr. Factor 0.2 Corrected 3.0, 2.5

Date and initials of person examining contents: 11/14/19

Temperature should be above freezing to 6°C

Chain of Custody present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>W</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: Janae Church Date: 11/20/19

CHAIN-OF-CUSTODY / Analytical Request Document

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



Page: 1 of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Golder Associates	Report To: Jeffrey Ingram	Attention:	Company Name:	NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER	RCRA <input type="checkbox"/> UST <input type="checkbox"/> OTHER <input type="checkbox"/>
Address: 13515 Barrett Parkway Dr., Ste 260	Copy To:	Address:	Address:	Site Location	STATE: MO
Email To: jeffrey_ingram@golder.com	Purchase Order No.:	Pace Quote Reference:	Pace Project Manager:		
Phone: 636-724-9191	Project Name: Ameren Sioux Energy Center SCPB	Project Profile #:	Project Profile #:		
Requested Due Date/TAT: Standard	Project Number:				

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DW DRINKING WATER WT WATER WW WASTE WATER P PRODUCT SL SOIL/SOLID OL OIL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives HCl HNO ₃ H ₂ SO ₄ Unpreserved	Analysis Test ↑ Metals* Chloride/Fluoride/Sulfate TDS Alkalinity	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START	COMPOSITE END/GRAB							
1	S-LMW-1S		WT G	G		11-5-19	1314	2					201
2	S-LMW-2S		WT G	G		11-5-19	1405	2					202
3	S-LMW-3S		WT G	G		11-5-19	1105	2					203
4	S-LMW-4S		WT G	G		11-5-19	1204	2					204
5	S-LMW-5S		WT G	G		11-5-19	1052	2					205
6	S-LMW-6S		WT G	G		11-5-19	1148	2					206
7	S-LMW-7S		WT G	G		11-5-19	1231	2					207
8	S-LMW-8S		WT G	G		11-5-19	1331	2					208
9	S-LMW-9S		WT G	G		11-5-19	1418	2					209
10	S-BMW-1S		WT G	G		11-5-19	1443	2					210
11	S-BMW-3S		WT G	G		11-5-19	1218	2					211
12	S-LMW-DUP-1		WT G	G		11-5-19	-	2					212

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7-B, Ca, Fe, Mn, Mg, K, Na	Annie Muensterh / Golder	11-15-19	1540	Angela Munnaw	11-15-19	1545	Received on Ice (Y/N) <input type="checkbox"/> Cooler (Y/N) <input type="checkbox"/> Custody Sealed (Y/N) <input type="checkbox"/> Samples Intact (Y/N) <input type="checkbox"/>
	Angela Munnaw	11-15-19	1545	Angela Munnaw	11-15-19	1545	Received on Ice (Y/N) <input type="checkbox"/> Cooler (Y/N) <input type="checkbox"/> Custody Sealed (Y/N) <input type="checkbox"/> Samples Intact (Y/N) <input type="checkbox"/>

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER: Annie Muensterh	DATE Signed (MM/DD/YYYY): 11-15-19
SIGNATURE of SAMPLER: <i>Annie Muensterh</i>	

*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.



CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Golder Associates	Report To: Jeffrey Ingram	Report To: Jeffrey Ingram	Company Name:	Attention:	
Address: 13515 Barrett Parkway Dr., Ste 260 Ballwin, MO 63021	Purchase Order No.:	Address:	REGULATORY AGENCY	NPDES	GROUND WATER
Email To: jeffrey_ingram@golder.com	Project Name: Ameren Sioux Energy Center SCPB	Pace Quote Reference:	UST	RCRA	DRINKING WATER
Phone: 636-724-9191	Project Number:	Pace Project Manager:	MO	OTHER	
Requested Due Date/TAT: Standard		Pace Profile #:	Site Location STATE: MO		

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW WATER PRODUCT P SOLID OIL SOLIDS OIL OIL	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Analysis Test ↑ Metals* Chloride/Fluoride/Sulfate TDS Alkalinity	Requested Analysis Filtered (Y/N)	Temp in °F	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)	
				COMPOSITE START	COMPOSITE END/GRAB														
1		WT	G	11-15-11		11-15-11	15:45	11/15/11	15:45		2								
2	S-LMW-DUP-2	WT	G								2								
3	S-LMW-FB-1	WT	G								2								
4	S-LMW-FB-2	WT	G								2								
5		WT	G																
6		WT	G																
7		WT	G																
8		WT	G																
9		WT	G																
10		WT	G																
11		WT	G																
12		WT	G																

RELINQUISHED BY / AFFILIATION: AMGEN DATE: 11/15/11 TIME: 15:45

ACCEPTED BY / AFFILIATION: [Signature] DATE: 11/15/11 TIME: 01:55

SAMPLE CONDITIONS: Received on Ice (Y/N) Y, Custody Sealed (Y/N) Y, Samples Intact (Y/N) Y

SAMPLER NAME AND SIGNATURE: [Signature]
 PRINT Name of SAMPLER: [Name]
 SIGNATURE of SAMPLER: [Signature]
 (MM/DD/YYYY): [Date]

MEMORANDUM**DATE** January 9, 2020**Project No.** 153140601**TO** Project File
Golder Associates**CC** Amanda Derhake, Jeff Ingram**FROM** Tommy Goodwin**EMAIL** Tommy_Goodwin@golder.com**DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPB – DATA PACKAGE 60321513**

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

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a compound was detected in a blank (i.e. method, field) and the blank comparison criterion was not met, associated sample results were qualified as estimates (J) or non-detects (U).
- When MS/MSD recovery exceeded the QC limits, the associated sample result was qualified as an estimate (J).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren - Sioux - SCPB
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 153140601
 Validation Date: 1/8/2020

Laboratory: Pace Analytical - KS

SDG #: 60321513

Analytical Method (type and no.): EPA 200.7 (Metals); SM 2320B (Alk); SM 2540C (TDS); EPA 300.0 (Anions)

Matrix: Air Soil/Sed. Water Waste

Sample Names S-LMW-1S, S-LMW-2S, S-LMW-3S, S-LMW-4S, S-LMW-5S, S-LMW-6S, S-LMW-7S, S-LMW-8S, S-LMW-9S, S-BMW-1S, S-BMW-3S, S-LMW-DUP-1, S-LMW-DUP-2, S-LMW-FB-1, S-LMW-FB-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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>11/15/2019</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u></u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u></u>
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u></u>
e) Sample type indicated (<u>grab</u> /composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u></u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u></u>
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Sp.Cond, ORP, Temp, DO, Turb</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u></u>
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u></u>
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u></u>
Note Deficiencies: <u></u>				
<u></u>				
<u></u>				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u></u>
b) Was the COC signed by both field and laboratory personnel?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Page 2 of COC not completed/signed by field staff</u>
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u></u>

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DUP-1 @ S-LMW-3S, DUP-2 @ S-LMW-4S
				FB-1 @ S-LMW-6S, FB-2 @ S-LMW-8S
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-002 (Alk, TDS); -010 (Alk); -012 (TDS)
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Comments/Notes:

MB: -13001-15: Fe (21.5),

FB-1: Ca (67.7)

MS/MSD: -13002: B (MS/MSD-H_132/144%), Ca (MSD-H_140%)

-13010: Ca (MS-L_26%)

DUP-2: Fe (112), FI (20.7), no qualification necessary for DUP-2 samples

Max Lab Duplicate RPD: 9% (Limit 10%)

Dilutions: Chloride and Sulfate diluted in several samples; no qualification is necessary.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-LMW-2S	Boron (B)	11,200	J	MS/MSD Outside Calibration Range
"	Calcium (Ca)	170,000	J	MSD Outside Calibration Range
S-LMW-4S	Iron (Fe)	50.0	U	Analyte Detected in Method Blank (MB); PQL>Result>MDL
S-BMW-1S	Ca	143,000	J	MSD Outside Calibration Range

Signature:  _____

Date: 1/9/2020 _____

APPENDIX B

**Alternative Source Demonstration -
November 2018 Sampling Event**

TECHNICAL MEMORANDUM

DATE May 16, 2019

Project No. 1531406

TO Ameren Missouri
1901 Chouteau Ave, St. Louis, Mo 63103

FROM Golder Associates Inc.

SCPB – ALTERNATIVE SOURCE DEMONSTRATION – NOVEMBER 2018 SAMPLING EVENT

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), Golder Associates Inc. ("Golder") has prepared this Technical Memorandum that indicates Statistically Significant Increases (SSIs) calculated at Ameren Missouri's (Ameren) Sioux Energy Center (SEC), fly ash surface impoundment (SCPB) result from an alternative source. This SCPB Alternative Source Demonstration (ASD) 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.

2.0 BACKGROUND

In November 2017, the first round of detection monitoring was completed at the SEC's SCPB Coal Combustion Residual (CCR) Unit in St. Charles County, Missouri. This sampling was completed in accordance with the CCR Rule and SSIs were identified and verified. In February/March 2018, additional drilling and a detailed analysis of results were completed for the SCPB and it was determined that the SSIs in the CCR Rule groundwater monitoring wells at the SCPB were not caused by impacts from the SCPB. The SSIs observed in SCPB wells were caused by an alternative source, which is the unlined, adjacent SCPA surface impoundment. A copy of the ASD report for the November 2017 sampling event is provided in Appendix B of the 2018 SCPB Annual Groundwater Monitoring and Corrective Action Report.

3.0 NOVEMBER 2018 SAMPLING EVENT

A summary of the November 2018 sampling results can be found in Table 1 of this Technical Memorandum. Figure 1 of this Technical Memorandum displays where November 2018 SCPB CCR Rule groundwater monitoring well samples plot in comparison to cations/anions for the SCPA pore-water, SCPB pore-water, and background groundwater zones. As displayed in this figure, the monitoring wells around the SCPB plot in similar locations to those from November 2017. These results also display that monitoring wells that have SSIs in the November 2018 sampling event plot between the background groundwater quality and the SCPA pore-water. Like the November 2017 Sampling Event ASD, results from this diagram demonstrate that groundwater data from the monitoring wells around the SCPB are impacted by the SCPA and not the SCPB.

Additional supporting lines of evidence from the November 2017 Sampling Event ASD are also applicable in this November 2018 Sampling Event ASD. Additional evidence includes:

- Potentiometric surface mapping from 2018 continues to show that while groundwater conditions can be variable, net groundwater flow around the SCPB is toward the east/southeast, flowing from the SCPA toward the SCPB. This supports the conclusion that the unlined SCPA is the source of impacts at the downgradient monitoring wells because impacted monitoring wells around the SCPB are frequently downgradient from the SCPA.
- The SCPB was constructed with an engineered liner system consisting of a 60-mil High Density Polyethylene (HDPE) geomembrane liner with a bottom elevation of approximately 419 FT MSL at its lowest point. The low permeability HDPE liner system in the SCPB is a barrier to CCR impact migration and provides containment for CCR.
- The SCPA began operation in 1967 and has a bottom elevation estimated to be approximately 370 FT MSL. In addition to the different pore-water fingerprints, there are elevated concentrations of CCR impact indicators in the intermediate and deep zones of groundwater in the alluvial aquifer as shown in the SCPA Annual report. Since impacts are present in the shallow, middle, and deep alluvial zones and are not isolated to the shallow zone where SCPB impacts would most readily occur, the impacts are most likely from the SCPA, which extends to deeper depths in the aquifer.

In summary, groundwater chemistry, pore-water chemistry fingerprints, cell construction and hydrogeological evidence all demonstrate that impacts (SSIs) calculated during the November 2018 Sampling Event for the SCPB CCR Unit were not caused by impacts from the SCPB surface impoundment, and the SCPA surface impoundment is the source of the SCPB SSIs.

CERTIFICATION STATEMENT

This *SCP*B – *Alternative Source Demonstration – November 2018 Sampling Event* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule under the direction of a licensed professional engineer with Golder Associates Inc.

I hereby certify that this *SCP*B – *Alternative Source Demonstration – November 2018 Sampling Event* located at 8501 Missouri 94, West Alton, Missouri 63386 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

GOLDER ASSOCIATES INC.



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

Principal, Practice Leader

Table 1
November 2018 Detection Monitoring Results
SCPB Surface Impoundment
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS								
			BMW-1S	BMW-3S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	LMW-9S
November 2018 Detection Monitoring Event													
DATE	NA	NA	11/12/2018	11/12/2018	11/14/2018	11/16/2018	11/16/2018	11/14/2018	11/16/2018	11/14/2018	11/14/2018	11/14/2018	11/16/2018
pH	SU	6.369-7.556	7.46	7.49	7.40	6.95	6.75	6.06	6.74	6.81	6.84	6.93	6.82
BORON, TOTAL	µg/L	107.5	72.9 J	61.5 J	539	8,530	298	1,020	13,400	10,400	2,740	8,500	1,760
CALCIUM, TOTAL	µg/L	170,705	157,000	124,000	79,400	197,000	188,000	179,000	280,000	199,000	221,000	177,000	194,000
CHLORIDE, TOTAL	mg/L	12.34	6.7	10.1	42.6	174	51.3	2.9	27.9	2.2	11.6	38.9	278
FLUORIDE, TOTAL	mg/L	0.38	0.34	0.36	0.37	0.32	0.26	0.35	0.34	0.32	0.34	0.87	0.56
SULFATE, TOTAL	mg/L	34.49	28.8	25.6	62.2	188	54.3	50.0	912	385	396	405	163
TOTAL DISSOLVED SOLIDS	mg/L	565	556	436	346	1,040	709	814	1,530	771	1,020	925	1,020
January 2019 Verification Sampling Event													
DATE	NA	NA				1/7/2019	1/7/2019	1/7/2019					1/7/2019
pH	SU	6.369-7.556				7.00	6.85	6.94					6.97
BORON, TOTAL	µg/L	107.5											
CALCIUM, TOTAL	µg/L	170,705					168,000	139,000					182,000
CHLORIDE, TOTAL	mg/L	12.34											
FLUORIDE, TOTAL	mg/L	0.38											
SULFATE, TOTAL	mg/L	34.49						38.1 J					
TOTAL DISSOLVED SOLIDS	mg/L	565				1,010		530					

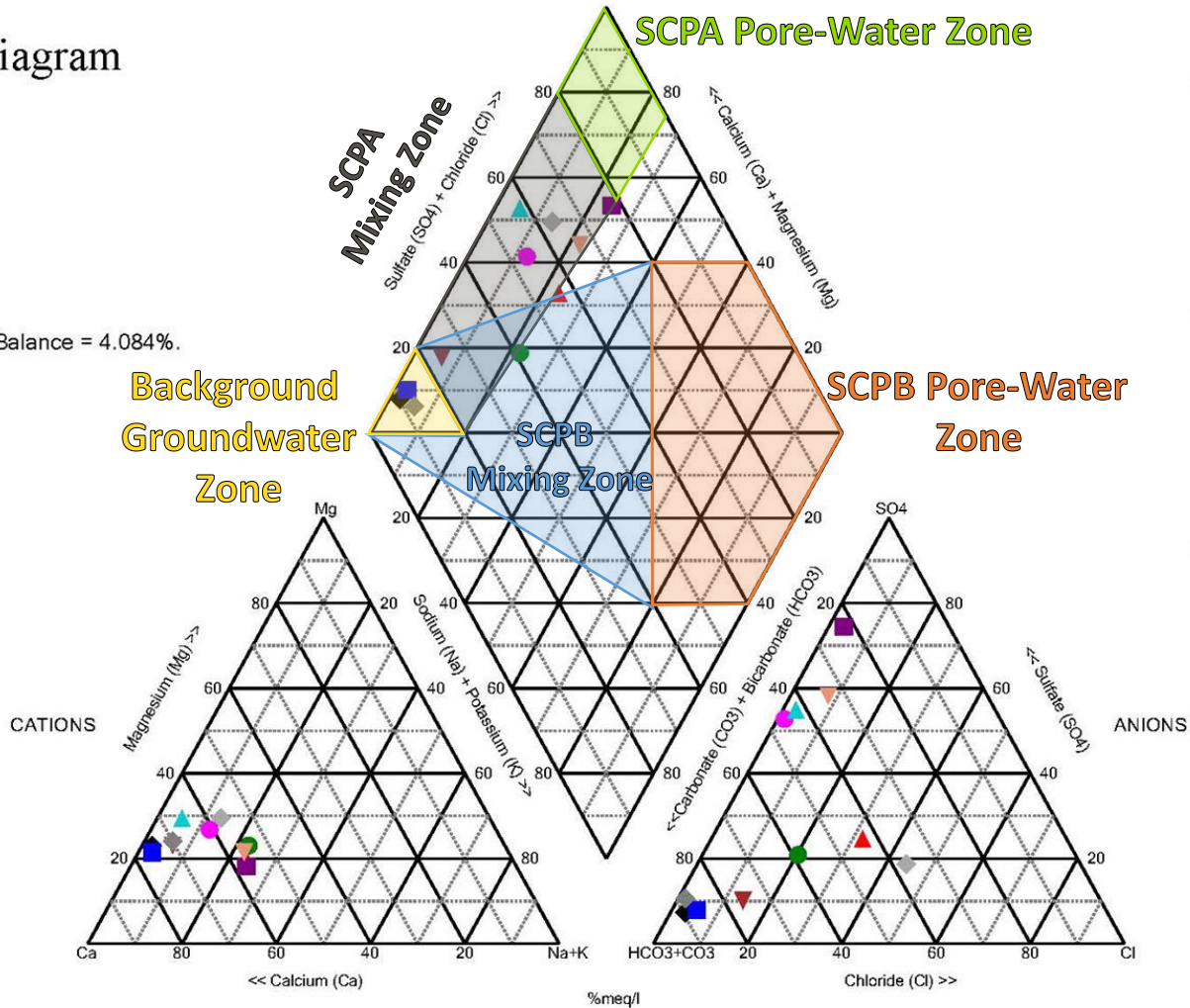
NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Prediction Limits calculated using Sanitas Software.
6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
9. Only analytes/wells that were detected above the prediction limit and that had not already been verified were tested during Verification Sampling.

Prepared By: RJF
Checked By: EMS
Reviewed By: MNH

Piper Diagram

Cation-Anion Balance = 4.084%.



- ◆ S-BMW-1S* 11/12/2018
- S-BMW-3S* 11/12/2018
- S-LMW-1S 11/14/2018
- ▲ S-LMW-2S 11/16/2018
- ▼ S-LMW-3S 11/16/2018
- ◆ S-LMW-4S 11/14/2018
- S-LMW-5S 11/16/2018
- S-LMW-6S 11/14/2018
- ▲ S-LMW-7S 11/14/2018
- ▼ S-LMW-8S 11/14/2018
- ◆ S-LMW-9S 11/16/2018

Notes:

- 1.) Data used to generate diagram available SCPB Annual Report.
- 2.) Piper diagram generated using Sanitas Software.

CLIENT/PROJECT
**AMEREN MISSOURI
 SIOUX ENERGY CENTER**



TITLE
**SCPB PIPER DIAGRAM FOR NOVEMBER
 2018**

PREPARED JSI	CHECKED JAP	REVIEWED MNH	DATE 2019-03-29	SCALE NA	FILE NO. NA	PROJECT NO. 153-1406.0003	DRAWING NO. NA	SUBTITLE NA	REV. NO. 0	FIGURE 1
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APPENDIX C

**Alternative Source Demonstration-
August 2019 Sampling Event**

TECHNICAL MEMORANDUM

DATE January 2020

Project No. 153140601

TO Ameren Missouri
1901 Chouteau Ave, St. Louis, Mo 63103

FROM Mark Haddock, Jeffrey Ingram

SCPB – ALTERNATIVE SOURCE DEMONSTRATION – AUGUST 2019 SAMPLING EVENT

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), Golder Associates Inc. ("Golder") has prepared this Technical Memorandum that indicates Statistically Significant Increases (SSIs) calculated at Ameren Missouri's (Ameren) Sioux Energy Center (SEC), fly ash surface impoundment (SCPB) result from an alternative source. This SCPB Alternative Source Demonstration (ASD) 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.

2.0 BACKGROUND

In November 2017, the first round of detection monitoring was completed at the SEC's SCPB Coal Combustion Residual (CCR) Unit in St. Charles County, Missouri. This sampling was completed in accordance with the CCR Rule and SSIs were identified and verified. In February/March 2018, additional drilling and a detailed analysis of results were completed for the SCPB and it was determined that the SSIs in the CCR Rule groundwater monitoring wells at the SCPB were not caused by impacts from the SCPB. The SSIs observed in SCPB wells were caused by an alternative source, which is the adjacent SCPA surface impoundment. A copy of the ASD report for the November 2017 sampling event is provided in Appendix B of the 2018 SCPB Annual Groundwater Monitoring and Corrective Action Report.

3.0 AUGUST 2019 SAMPLING EVENT

A summary of the August 2019 sampling results can be found in **Table 1. Figure 1** of this Technical Memorandum displays where August 2019 SCPB CCR Rule groundwater monitoring well samples plot in comparison to cations/anions for the SCPA pore-water, SCPB pore-water, and background groundwater zones. As displayed in this figure, the monitoring wells around the SCPB plot in similar locations to those from 2017 and wells in the August 2019 sampling event plot between the background groundwater quality and the SCPA pore-water zones. Like the November 2017 Sampling Event ASD, results from this diagram demonstrate that groundwater quality in the monitoring wells around the SCPB is impacted by the SCPA and not the SCPB.

Additional supporting lines of evidence from the November 2017 Sampling Event ASD are also applicable in this August 2019 Sampling Event ASD. Summaries of supporting lines of evidence include:

- Potentiometric surface mapping from 2018 and 2019 continue to show that while groundwater conditions can be variable, net groundwater flow around the SCPB is toward the northeast, flowing from the SCPA toward the SCPB. This supports the conclusion that the unlined SCPA is the source of impacts at the downgradient monitoring wells because impacted monitoring wells around the SCPB are frequently downgradient from the SCPA.
- The SCPB was constructed with an engineered liner system consisting of a 60-mil High Density Polyethylene (HDPE) geomembrane liner with a bottom elevation of approximately 419 feet above mean sea level (FT MSL) at its lowest point. The SCPA began operation in 1967 and has a bottom elevation estimated to be at approximately 370 FT MSL. Additionally, as shown in the SCPA Annual Report, there are elevated concentrations of CCR indicators in the intermediate and deep zones of the alluvial aquifer. Since impacts are present in the shallow, middle, and deep alluvial zones and are not isolated to the shallow zone, the impacts are most likely from the SCPA, which extends to deeper depths in the aquifer.

In summary, groundwater chemistry, pore-water chemistry fingerprints, cell construction and hydrogeological evidence all demonstrate that impacts (SSIs) calculated during the August 2019 Sampling Event for the SCPB CCR Unit were not caused by impacts from the SCPB surface impoundment, and the SCPA surface impoundment is the source of the SCPB SSIs.

CERTIFICATION STATEMENT

This *SCPB – Alternative Source Demonstration – August 2019 Sampling Event* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule under the direction of a licensed professional engineer with Golder Associates Inc.

I hereby certify that this *SCPB – Alternative Source Demonstration – August 2019 Sampling Event* located at 8501 Missouri 94, West Alton, Missouri 63386 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

GOLDER ASSOCIATES INC.



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

Principal, Practice Leader

Table 1
August 2019 Detection Monitoring Results
SCPB Surface Impoundment
Sioux Energy Center, St. Charles County, MO

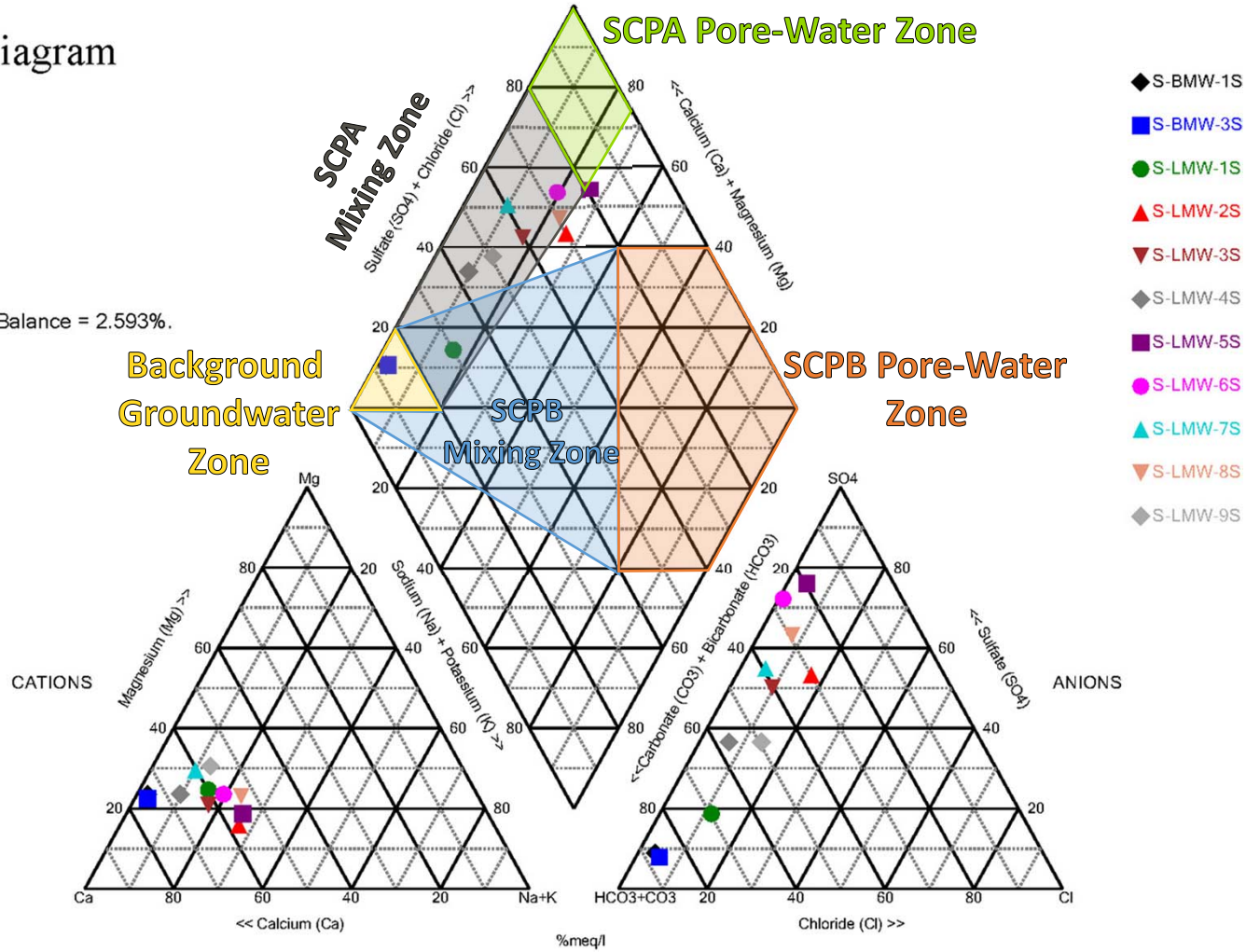
ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS								
			BMW-1S	BMW-3S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	LMW-9S
August 2019 Detection Monitoring Event													
DATE	NA	NA	8/2/2019	8/2/2019	8/2/2019	8/6/2019	8/5/2019	8/5/2019	8/5/2019	8/5/2019	8/5/2019	8/6/2019	8/9/2019
pH	SU	6.387-7.785	6.90	7.53	7.41	7.14	6.99	6.82	6.83	6.87	6.82	6.96	6.66
BORON, TOTAL	µg/L	118	ND	ND	279 J	9,830	804	4,090	14,500	18,600	4,360	8,060	1,660
CALCIUM, TOTAL	µg/L	168,826	149,000	122,000	61,200	150,000	140,000	149,000	277,000 J	268,000	214,000	160,000	214,000
CHLORIDE, TOTAL	mg/L	12.32	8.8	10.6	16.5	76.9	36.1	25.3	36.6 J	3.6	29.1	35.1	75.6
FLUORIDE, TOTAL	mg/L	0.395	0.31	0.35	0.34	0.37	0.35	0.24	ND	ND	0.37	0.92	0.38
SULFATE, TOTAL	mg/L	37.38	34.1	25.3	38.9	339	273	210	930	787	431	432	281
TOTAL DISSOLVED SOLIDS	mg/L	565	548	452	285	982	800	851	1,870	1,660	1,150	1,010	1,110
October 2019 Verification Sampling Event													
DATE	NA	NA						10/2/2019				10/1/2019	
pH	SU	6.387-7.785						6.67				6.74	
BORON, TOTAL	µg/L	118											
CALCIUM, TOTAL	µg/L	168,826											
CHLORIDE, TOTAL	mg/L	12.32						22.1 J			25.2		
FLUORIDE, TOTAL	mg/L	0.395											
SULFATE, TOTAL	mg/L	37.38											
TOTAL DISSOLVED SOLIDS	mg/L	565						800					

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. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Prediction Limits calculated using Sanitas Software.
6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
9. Only analytes/wells that were detected above the prediction limit and that had not already been verified were tested during Verification Sampling.

Piper Diagram

Cation-Anion Balance = 2.593%.



Notes:

- 1.) Data used to generate diagram is available in the SCPB Annual Report.
- 2.) Piper diagram generated using Sanitas Software.

CLIENT/PROJECT
AMEREN MISSOURI
SIOUX ENERGY CENTER



TITLE
SCPB PIPER DIAGRAM FOR AUGUST 2019

PREPARED JSI	CHECKED RJF	REVIEWED MNH	DATE 2020/01/16	SCALE NA	FILE NO. NA	PROJECT NO. 153-1406-01.0003	DRAWING NO. NA	SUBTITLE NA	REV. NO. 0	FIGURE 1
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APPENDIX D

Potentiometric Surface Maps



LEGEND

- Sioux Energy Center Property Boundary
- CCR Units**
 - SCPA - Bottom Ash Surface Impoundment
 - SCPB - Fly Ash Surface Impoundment
 - SCPC - WFGD Surface Impoundment
 - SCL4A - Dry CCR Disposal Area
- Groundwater Flow Direction

Groundwater Elevation Contour (FT MSL)

- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- SCPA Surface Impoundment Pond Gauge
- River Gauge Location
- Monitoring Well or Piezometer

NOTES

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
- 3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
- 4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- 5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 6.) TP-1S, PZ-6S, AND DG-11 WERE NOT USED IN POTENTIOMETRIC CONTOURING.

REFERENCE

- 1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
- 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
- 3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

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

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
JANUARY 07, 2019 POTENTIOMETRIC SURFACE MAP

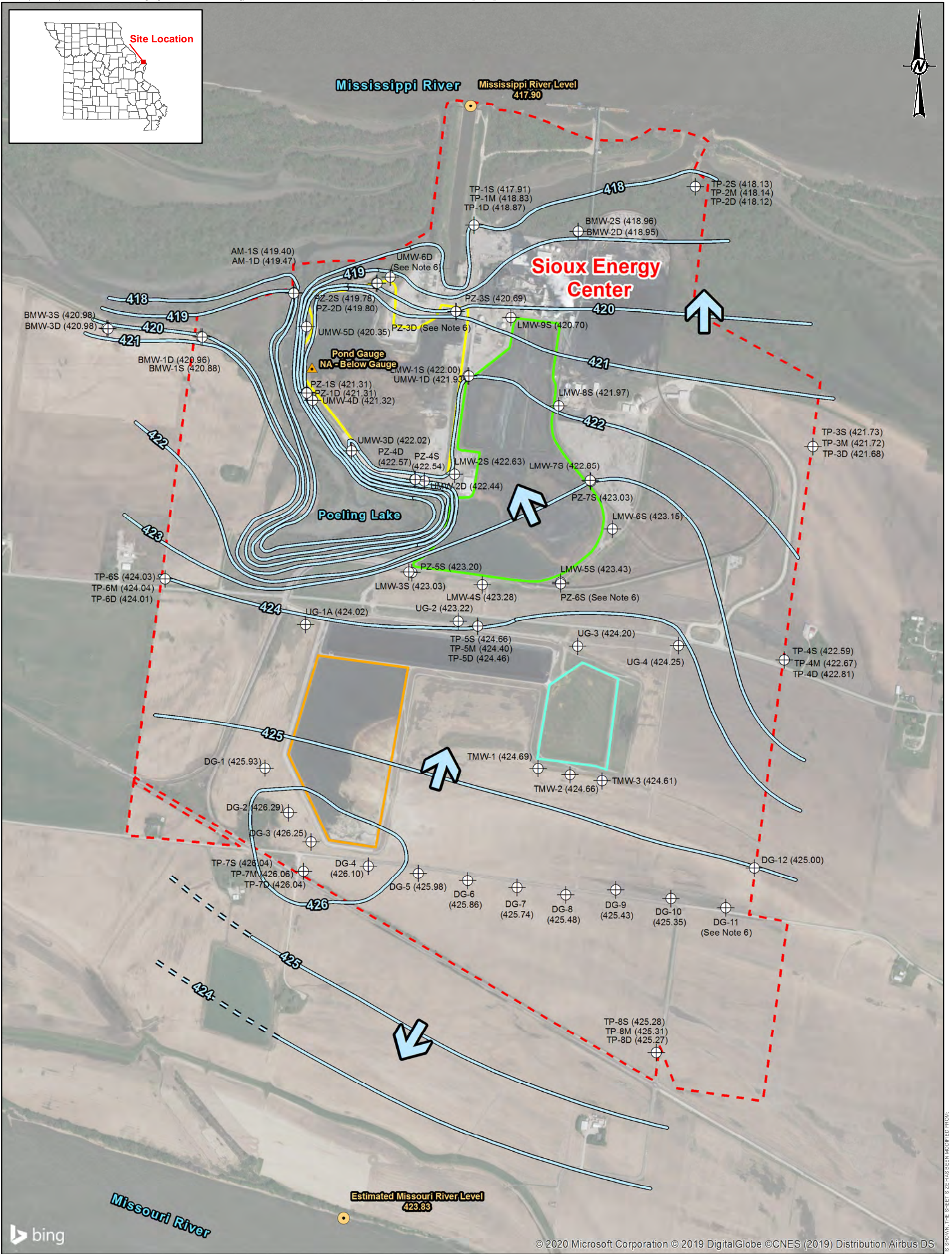
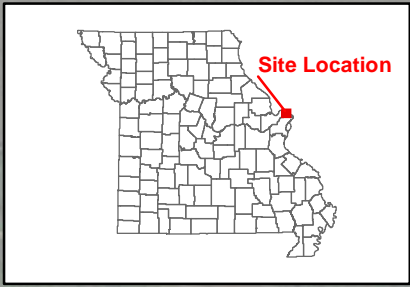
CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-24
PREPARED	JSI
DESIGN	JSI
REVIEW	AMM
APPROVED	MNH

PROJECT No. 153-1406 PHASE 0003

FIGURE P1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 11in



bing

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- LEGEND**
- - - Sioux Energy Center Property Boundary
 - CCR Units**
 - SCPA - Bottom Ash Surface Impoundment
 - SCPB - Fly Ash Surface Impoundment
 - SCPC - WFGD Surface Impoundment
 - SCL4A - Dry CCR Disposal Area
 - Groundwater Flow Direction

- Groundwater Elevation Contour (FT MSL)**
- = = Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Elevation Contour (FT MSL)
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- SCPA Surface Impoundment Pond Gauge
- River Gauge Location
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- 5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 6.) DG-11, PZ-3D, PZ-6S, AND UMW-6D WERE NOT USED IN POTENTIOMETRIC CONTOURING.

REFERENCE

- 1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
- 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
- 3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).



CLIENT
**AMEREN MISSOURI
SIOUX ENERGY CENTER**



PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
AUGUST 1, 2019 POTENTIOMETRIC SURFACE MAP

CONSULTANT



YYYY-MM-DD	2019-10-09
PREPARED	EMS
DESIGN	JSI
REVIEW	AMM
APPROVED	MNH

PROJECT No.
153-1406

PHASE
0003

FIGURE
P2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 11in



LEGEND

	Sioux Energy Center Property Boundary
CCR Units	
	SCPA - Bottom Ash Surface Impoundment
	SCPB - Fly Ash Surface Impoundment
	SCPC - WFGD Surface Impoundment
	SCL4A - Dry CCR Disposal Area
	Groundwater Flow Direction

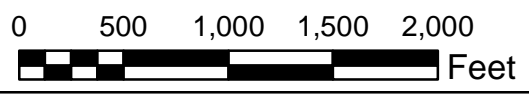
	Inferred Groundwater Elevation Contour (FT MSL)
	Groundwater Elevation Contour (FT MSL)
Ground/Surface Water Measurement Locations	
	SCPA Surface Impoundment Pond Gauge
	River Gauge Location
	Monitoring Well or Piezometer

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- 6.) DG-11 AND PZ-6S WERE NOT USED IN POTENTIOMETRIC CONTOURING.

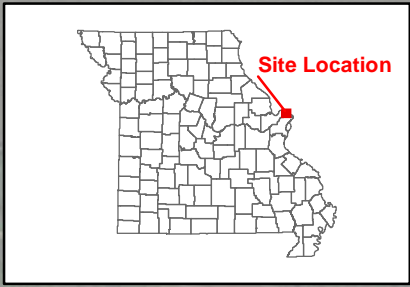
REFERENCE

- 1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
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CLIENT		
AMEREN MISSOURI SIOUX ENERGY CENTER		
PROJECT		
CCR GROUNDWATER MONITORING PROGRAM		
TITLE		
OCTOBER 1, 2019 POTENTIOMETRIC SURFACE MAP		
CONSULTANT		
PROJECT No.	PHASE	DATE
153-1406	0003	2019-10-21
		PREPARED
		AMM
		DESIGN
		JSI
		REVIEW
		BCW
		APPROVED
		MNH

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 11in



- LEGEND**
- - - Sioux Energy Center
 - - - Property Boundary
 - CCR Units**
 - SCPA - Bottom Ash Surface Impoundment
 - SCPB - Fly Ash Surface Impoundment
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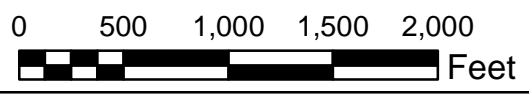
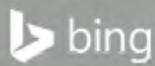
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CLIENT			
AMEREN MISSOURI		SIOUX ENERGY CENTER	
PROJECT		CCR GROUNDWATER MONITORING PROGRAM	
TITLE			
NOVEMBER 13, 2019 POTENTIOMETRIC SURFACE MAP			
CONSULTANT			
PROJECT No.	153-140601	PHASE	0003
CLIENT	AMEREN MISSOURI	DATE	2020-01-07
PREPARED	EMS	DESIGN	JSI
REVIEW	TJG	APPROVED	CMR



IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 11in



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