REPORT

2023 Annual Groundwater Monitoring and Corrective Action Report

LCPB Surface Impoundment, Labadie Energy Center, Franklin County, Missouri, USA

January 31, 2024

Project Number: 23007

Submitted to:

Ameren Missouri
1901 Chouteau Avenue
St. Louis, Missouri 63103

Submitted by:

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

EXECUTIVE SUMMARY AND STATUS OF THE LCPB GROUNDWATER MONITORING PROGRAM

This annual report was developed to meet the requirements of United States Environmental Protection Agency (USEPA) 40 CFR Part 257 “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule” (the CCR Rule). The CCR Rule requires owners or operators of existing CCR units to produce an Annual Groundwater Monitoring and Corrective Action Report (Annual Report) each year (§ 257.90(e)). Ameren Missouri (Ameren) has determined that the LCPB Coal Combustion Residuals (CCR) Surface Impoundment at the Labadie Energy Center (LEC) is subject to the requirements of the CCR Rule. This Annual Report for the LCPB describes CCR Rule groundwater monitoring activities from January 1, 2023 through December 31, 2023 including verification results related to late 2022 sampling.

Throughout 2023, the LCPB CCR unit has been operating under the Detection Monitoring Program (§257.94), which began October 17, 2017. As a part of Detection Monitoring, statistical evaluations are completed after each sampling event to determine if there are any values that represent a Statistically Significant Increase (SSI) over background concentrations. SSIs have been determined during each sampling event and a summary of the SSIs for the past year is provided in **Table 1**.

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

Event Name	Type of Event and Sampling Dates	Laboratory Analytical Data Receipt	Parameters Collected	Verified SSIs	SSI Determination Date	ASD Completion Date
October 2022 Sampling Event	Detection Monitoring, October 25-28, 2022	November 22, 2022	Appendix III, Major Cations and Anions	**pH:** LMW-2S **Boron:** LMW-1S, LMW-2S, LMW-3S, LMW-4S, LMW-6S, LMW-7S, LMW-8S **Chloride:** LMW-2S, LMW-3S, LMW-4S, LMW-7S **Fluoride:** LMW-3S, LMW-8S **Sulfate:** LMW-2S, LMW-3S, LMW-4S, LMW-7S, LMW-8S **TDS:** LMW-7S	February 20, 2023	May 19, 2023
	No Verification Sampling was required. No new SSIs were observed in the October 2022 sampling event.					
May 2023 Sampling Event	Detection Monitoring, May 11-24, 2023	June 29, 2023	Appendix III, Major Cations and Anions	**pH:** LMW-2S **Boron:** LMW-1S, LMW-2S, LMW-3S, LMW-4S, LMW-6S, LMW-7S, LMW-8S **Chloride:** LMW-2S, LMW-3S, LMW-4S, LMW-7S **Fluoride:** LMW-8S **Sulfate:** LMW-2S, LMW-3S, LMW-4S, LMW-7S	September 27, 2023	December 26, 2023
	Verification Sampling, July 13, 2023	NA(See Note 1)	Detected Appendix III parameters(See Note 2)			
November 2023 Sampling Event	Detection Monitoring, November 15-20, 2023	January 25, 2024	Appendix III, Major Cations and Anions	To be determined after statistical analysis and Verification Sampling are completed in 2024.		

Notes:
1) Not applicable – only a verification pH value was collected in the field, therefore no laboratory testing was required.
2) Only analytes/wells that were detected above the prediction limit and that had not already been verified were tested during Verification Sampling.
3) SSI – Statistically Significant Increase.
4) ASD – Alternative Source Demonstration.
5) TDS – Total Dissolved Solids.

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

There were no changes made to the monitoring system in 2023 with no new wells being installed or decommissioned. Substantial closure of the LCPB was completed in 2020, with the geomembrane liner system completed on December 15, 2020. Additional aspects of closure were completed in spring 2021, and the CCR unit is now closed. The LCPB has now transitioned into the post-closure care requirements of the CCR Rule. As outlined in §257.104 (Post-closure Care Requirements) of the CCR Rule, the monitoring system and programs must be maintained for at least 30 years after the completion of closure.

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APPENDICES

1.0 INSTALLATION OR DECOMISSIONING OF MONITORING WELLS

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

2.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

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

Table 2 – Summary of Groundwater Sampling Dates

Sampling Event	Groundwater Monitoring Wells										Monitoring Program
	BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S	
	Date of Sample Collection										
May 2023 Detection Monitoring	5/11/2023	5/11/2023	5/12/2023	5/19/2023	5/23/2023	5/24/2023	5/23/2023	5/18/2023	5/18/2023	5/18/2023	Detection
July 2023 Verification Sampling	-	-	-	-	7/13/2023	-	-	-	-	-	Detection
November 2023 Detection Monitoring	11/16/2023	11/16/2023	11/16/2023	11/20/2023	11/20/2023	11/17/2023	11/16/2023	11/15/2023	11/15/2023	11/16/2023	Detection
Total Number of Samples	2	2	2	2	3	2	2	2	2	2	NA

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

2.1 Detection Monitoring Program

A Detection Monitoring sampling event was completed October 25-28, 2022. The statistical analysis to evaluate for SSIs for the October 2022 event was not completed until 2023 and is included in this report. There were no new initial exceedances for the October 2022 event, therefore, no verification sampling was necessary. **Table 3** summarizes the results of the statistical analysis of the October 2022 Detection Monitoring event. Laboratory analytical data from each sampling event conducted in 2023 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 SSIs identified in October 2022 and is provided in

Appendix B. This ASD demonstrates that SSIs at the monitoring wells around LCPB are not caused by the LCPB CCR unit and the LCPB CCR unit remains in Detection Monitoring.

Detection Monitoring samples were collected May 11-24, 2023, and testing was completed for all Appendix III analytes, as well as major cations and anions. As outlined in the Statistical Analysis Plan for the site, updates to the statistical limits should be completed once four to eight new sample results are available. During the statistical analysis of the May 2023 sampling event, the statistical limits used to determine an SSI were updated according to the Statistical Analysis Plan. A new initial exceedance of one Appendix III analyte triggered verification sampling, which was completed July 13, 2023. The initial exceedance was not confirmed as an SSI. **Table 4** summarizes the results of the statistical analysis of the May 2023 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**. Similar to previous results, SSIs reported for the monitoring data are not caused by the LCPB CCR Unit and an ASD for this sampling event data is provided in **Appendix C**.

A Detection Monitoring sampling event was completed November 15-20, 2023 and testing was completed for all Appendix III analytes, as well as major cations and anions. The statistical analysis to evaluate for SSIs in the November 2023 data were not completed in 2023, so the results of this analysis will be provided in the 2024 Annual Report. **Table 5** summarizes the results of the November 2023 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

2.2 Groundwater Elevation, Flow Rate and Direction

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

Groundwater elevations were used to generate potentiometric surface maps included in **Appendix 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 Missouri River. Water flows into and out of the alluvial aquifer because of fluctuating river water levels that produce “bank recharge” and “bank discharge” conditions. Overall, based on the potentiometric surface maps, a general flow direction from the south/southwest (bluffs area) to the north/northeast (Missouri River) is observed under normal river conditions. However, during periods of high river levels, groundwater flow can temporarily reverse. During these times of high river stage and temporary flow direction changes, horizontal groundwater gradients generally decrease, and little net movement of groundwater occurs. Based on quarterly water level measurements collected in 2023, groundwater across the LEC exhibited typical flow towards the Missouri River throughout 2023.

Groundwater flow direction and hydraulic gradient were estimated for the alluvial aquifer wells at the Labadie Energy Center (LEC) using commercially available software to evaluate data since 2016. Results from this assessment indicate that while groundwater flow direction is variable, the overall net groundwater flow in the alluvial aquifer at the LEC is from the bluffs toward the river. Horizontal gradients calculated by the program range from 0.0001 to 0.0007 feet/foot with an estimated net annual groundwater movement of approximately 18 feet per year in the prevailing downgradient direction.

2.3 Sampling Issues

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

3.0 ACTIVITIES PLANNED FOR 2024

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

Tables

Table 3
October 2022 Detection Monitoring Results
LCPB Surface Impoundment
Labadie Energy Center, Franklin County, MO

			BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	PREDICTION LIMITS	BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S
October 2022 Detection Monitoring Event												
DATE	NA	NA	10/27/2022	10/27/2022	10/27/2022	10/25/2022	10/25/2022	10/25/2022	10/26/2022	10/28/2022	10/28/2022	10/27/2022
pH	SU	6.239-7.394	6.68	6.95	6.97	9.52	7.10	6.80	6.70	6.81	6.57	7.10
BORON, TOTAL	µg/L	147	91.2 J	45.3 J	2,240	3,250	4,340	5,490	55.6 J	1,150	7,050	2,760
CALCIUM, TOTAL	µg/L	219,000	185,000	146,000	108,000	75,900	112,000	139,000	170,000	118,000	185,000	82,700
CHLORIDE, TOTAL	mg/L	7.654	5.9	1.4	4.9	15.8	20.8	39.5	1.9	3.1 J	17.5	3.2 J
FLUORIDE, TOTAL	mg/L	0.2606	ND	ND	ND	ND	0.33 J	0.13 J	ND	0.26	ND	0.54
SULFATE, TOTAL	mg/L	75.37	66.5	34.4	74.3	299	198	174	12.3	29.0	202	93.1
TOTAL DISSOLVED SOLIDS	mg/L	792	710	496	430	556	700	756	501	450	829	404 J

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
5. Prediction Limits calculated using Sanitas Software.
6. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. There were no new initial exceedances for the October 2022 event; therefore, no Verification Sampling was necessary.

Prepared By: GTM
Checked By: ANT
Reviewed By: MNH

Table 4
May 2023 Detection Monitoring Results
LCPB Surface Impoundment
Labadie Energy Center, Franklin County, MO

			BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	PREDICTION LIMITS	BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S
May 2023 Detection Monitoring Event												
DATE	NA	NA	5/11/2023	5/11/2023	5/12/2023	5/19/2023	5/23/2023	5/24/2023	5/23/2023	5/18/2023	5/18/2023	5/18/2023
pH	SU	6.416-7.307	6.76	7.03	7.09	9.55	7.34	6.86	6.80	6.87	6.84	7.27
BORON, TOTAL	µg/L	141.2	88.2 J	45.3 J	930	3,180	4,300	4,580	40.6 J	1,060	7,890	1,050
CALCIUM, TOTAL	µg/L	221,000	191,000	141,000	109,000	79,600	88,400	163,000	153,000	119,000	161,000	81,900
CHLORIDE, TOTAL	mg/L	7.564	6.6	2.2	4.6	14.6	27.0	66.0	4.9	3.0	18.7	1.6
FLUORIDE, TOTAL	mg/L	0.2154	ND	ND	ND	ND	0.20 J	ND	ND	ND	ND	0.36
SULFATE, TOTAL	mg/L	75.18	65.9	39.7	40.3	311	251 J	133	8.5	26.8	209	44.7
TOTAL DISSOLVED SOLIDS	mg/L	828	801	607	597	567	693	767	503	448	800	400
July 2023 Verification Sampling Event												
DATE	NA	NA					7/13/2023					
pH	SU	6.416-7.307					7.12					
BORON, TOTAL	µg/L	141.2										
CALCIUM, TOTAL	µg/L	221,000										
CHLORIDE, TOTAL	mg/L	7.564										
FLUORIDE, TOTAL	mg/L	0.2154										
SULFATE, TOTAL	mg/L	75.18										
TOTAL DISSOLVED SOLIDS	mg/L	828										

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

Prepared By: GTM
Checked By: JSI
Reviewed By: MNH

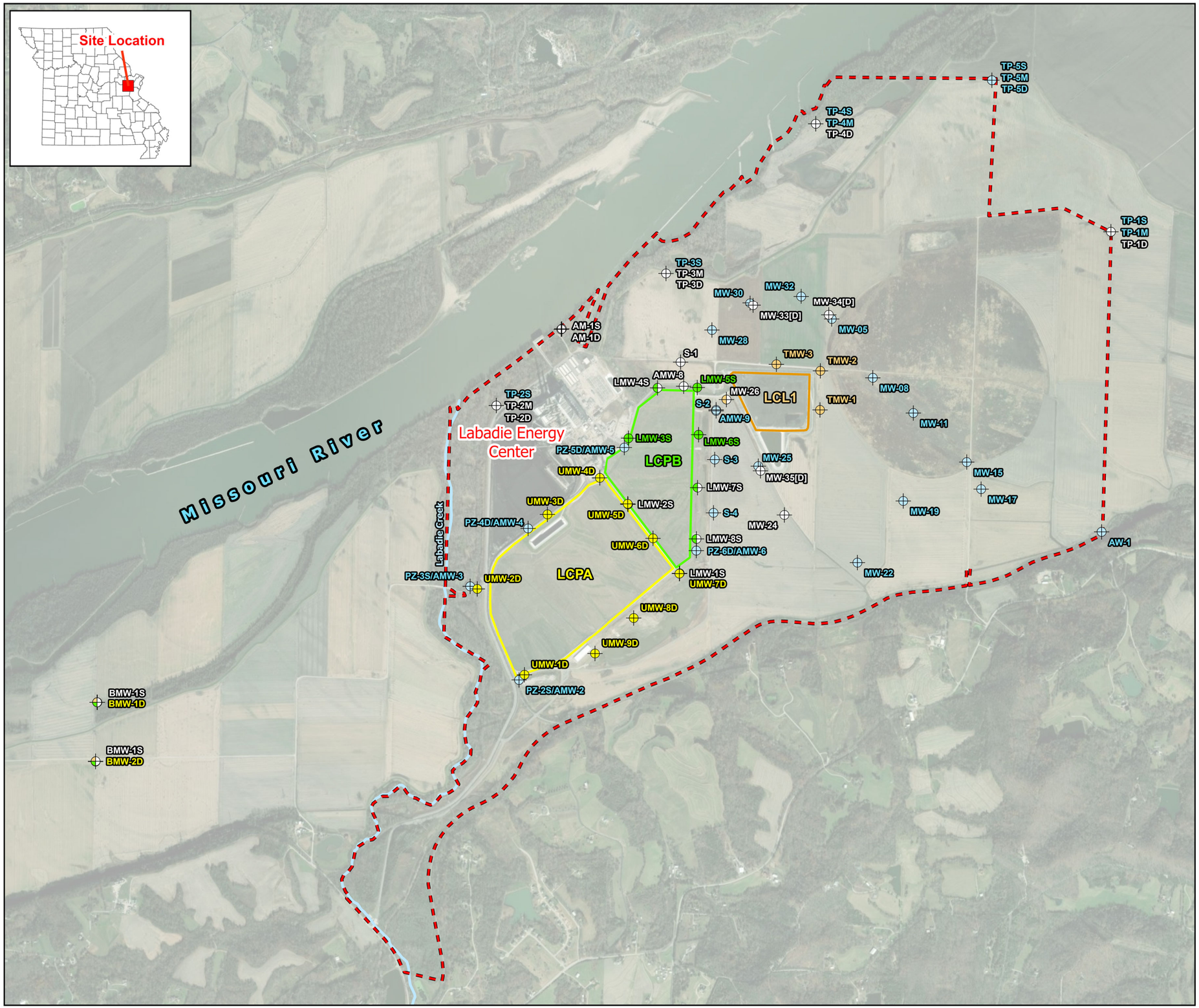
Table 5
November 2023 Detection Monitoring Results
LCPB Surface Impoundment
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S
November Detection Monitoring Event											
DATE	NA	11/16/2023	11/16/2023	11/16/2023	11/20/2023	11/20/2023	11/17/2023	11/16/2023	11/15/2023	11/15/2023	11/16/2023
pH	SU	6.71	7.04	7.16	9.54	7.12	6.88	6.79	6.89	6.82	7.02
BORON, TOTAL	µg/L	113	50.8 J	1,060	3,450	4,220	3,470	55.0 J	806	6,580	1,550
CALCIUM, TOTAL	µg/L	208,000	150,000	103,000	84,300	109,000	178,000	154,000	131,000	184,000	118,000
CHLORIDE, TOTAL	mg/L	5.3	2.8	4.0	15.0	21.1	60.7	3.9	3.2	13.5	3.9
FLUORIDE, TOTAL	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SULFATE, TOTAL	mg/L	72.4	38.3	41.2	337	92.3	116	7.9 J	31.6	192	79.2
TOTAL DISSOLVED SOLIDS	mg/L	692	471	348	533 J	671	722	434	479 J	607	462

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

Prepared By: JSI
Checked By: ANT
Reviewed By: MNH

Figures



TITLE

LABADIE ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND MONITORING WELL LOCATION MAP

Legend

Approximate Property Boundary

Labadie Energy Center CCR Units

- LCPA - Closed Bottom Ash Surface Impoundment
- LCPB - Closed Fly Ash Surface Impoundment
- LCL1 - Utility Waste Landfill Cell 1

Monitoring Well Network

- Corrective Action Monitoring Well
- LCPA Monitoring Well
- LCPB Monitoring Well
- LCPB and Corrective Action Monitoring Well
- LCL1 Monitoring Well
- LCL1 and Corrective Action Monitoring Well
- Background Well Used for LCPA, Corrective Action, LCPB, and LCL1 Monitoring
- Monitoring Well Used for Water Level Elevation Measurements Only

NOTES

1. All locations and boundaries are approximate.

REFERENCES

1. Zahner and Associates, Inc. 2016. Lot Consolidation Plat of "Labadie Energy Center" - Prepared for Ameren Missouri. Revised June 15, 2016.
2. USGS (United States Geological Survey), National Water Information System, USGS Gauge 06935550 Missouri River near Labadie, MO.

0 500 1,000 2,000 3,000 4,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-12-18
PREPARED	JSI	PROJECT No.	23007
REVIEW	GTM		
APPROVED	MNH		

FIGURE 1

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

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.1-LEC\4.1.2 - Production\Other Maps\Annual Report Figure 1.aprx

Appendix A
Laboratory Analytical Data

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

January 29, 2024

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

RE: Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between May 13, 2023 and May 26, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

REV-1, 1/29/24: Parameters not required under the CCR rule removed.

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

Sincerely,

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

Enclosures

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
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CERTIFICATIONS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Pace Analytical Services Kansas

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

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60429254002	**L-LMW-6S**	Water	05/18/23 17:10	05/20/23 04:40
60429254005	**L-LMW-FB-1**	Water	05/18/23 17:25	05/20/23 04:40
60429254006	**L-LMW-3S**	Water	05/23/23 10:36	05/24/23 04:46
60429254007	**L-LMW-5S**	Water	05/23/23 12:40	05/24/23 04:46
60429254008	**L-LMW-DUP-1**	Water	05/23/23 00:00	05/24/23 04:46
60429254009	**L-LMW-MS-1**	Water	05/23/23 10:36	05/24/23 04:46
60429254010	**L-LMW-MSD-1**	Water	05/23/23 10:36	05/24/23 04:46
60428743003	**L-LMW-1S**	Water	05/12/23 09:04	05/13/23 04:43
60429254001	**L-LMW-2S**	Water	05/19/23 10:54	05/20/23 04:40
60428743024	**L-LMW-4S**	Water	05/24/23 17:13	05/26/23 04:34
60429254003	**L-LMW-7S**	Water	05/18/23 15:23	05/20/23 04:40
60429254004	**L-LMW-8S**	Water	05/18/23 14:00	05/20/23 04:40
60428743001	**L-BMW-1S**	Water	05/11/23 13:22	05/13/23 04:43
60428743002	**L-BMW-2S**	Water	05/11/23 10:34	05/13/23 04:43

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60429254002	**L-LMW-6S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60429254005	**L-LMW-FB-1**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60429254006	**L-LMW-3S**	EPA 200.7	MA1	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	BLA	3	PASI-K
60429254007	**L-LMW-5S**	EPA 200.7	MA1	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	BLA	3	PASI-K
60429254008	**L-LMW-DUP-1**	EPA 200.7	MA1	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	BLA	3	PASI-K
60428743003	**L-LMW-1S**	EPA 200.7	MA1	7	PASI-K
		SM 2320B	BLA	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60429254001	**L-LMW-2S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428743024	**L-LMW-4S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	BLA	3	PASI-K
60429254003	**L-LMW-7S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60429254004	**L-LMW-8S**	EPA 200.7	JXD	7	PASI-K

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	JS2	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428743001	**L-BMW-1S**	EPA 200.7	MA1	7	PASI-K
		SM 2320B	BLA	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60428743002	**L-BMW-2S**	EPA 200.7	MA1	7	PASI-K
		SM 2320B	BLA	1	PASI-K
		SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-6S **Lab ID: 60429254002** Collected: 05/18/23 17:10 Received: 05/20/23 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**1060**	ug/L	100	6.4	1	06/13/23 13:43	06/19/23 09:04	7440-42-8	
Calcium	**119000**	ug/L	200	26.9	1	06/13/23 13:43	06/19/23 09:04	7440-70-2	
Iron	**8160**	ug/L	50.0	9.1	1	06/13/23 13:43	06/19/23 09:04	7439-89-6	
Magnesium	**21100**	ug/L	50.0	20.1	1	06/13/23 13:43	06/19/23 09:04	7439-95-4	
Manganese	**1140**	ug/L	5.0	0.39	1	06/13/23 13:43	06/19/23 09:04	7439-96-5	
Potassium	**4610**	ug/L	500	69.7	1	06/13/23 13:43	06/19/23 09:04	7440-09-7	
Sodium	**10800**	ug/L	500	115	1	06/13/23 13:43	06/19/23 09:04	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**402**	mg/L	20.0	10.5	1		05/24/23 12:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**448**	mg/L	10.0	10.0	1		05/24/23 09:11		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.0**	mg/L	1.0	0.53	1		06/13/23 13:43	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/23 13:43	16984-48-8	
Sulfate	**26.8**	mg/L	20.0	11.0	20		06/13/23 13:56	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-FB-1 **Lab ID: 60429254005** Collected: 05/18/23 17:25 Received: 05/20/23 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**<6.4**	ug/L	100	6.4	1	06/13/23 13:43	06/19/23 09:16	7440-42-8	
Calcium	**37.0J**	ug/L	200	26.9	1	06/13/23 13:43	06/19/23 09:16	7440-70-2	B
Iron	**<9.1**	ug/L	50.0	9.1	1	06/13/23 13:43	06/19/23 09:16	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	06/13/23 13:43	06/19/23 09:16	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	06/13/23 13:43	06/19/23 09:16	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	06/13/23 13:43	06/19/23 09:16	7440-09-7	
Sodium	**<115**	ug/L	500	115	1	06/13/23 13:43	06/19/23 09:16	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		05/24/23 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**9.0**	mg/L	5.0	5.0	1		05/24/23 09:12		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		06/13/23 15:30	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/23 15:30	16984-48-8	
Sulfate	**<0.55**	mg/L	1.0	0.55	1		06/13/23 15:30	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-3S **Lab ID: 60429254006** Collected: 05/23/23 10:36 Received: 05/24/23 04:46 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**4300**	ug/L	100	6.4	1	05/26/23 09:27	06/12/23 12:27	7440-42-8	
Calcium	**88400**	ug/L	200	26.9	1	05/26/23 09:27	06/12/23 12:27	7440-70-2	
Iron	**5770**	ug/L	50.0	9.1	1	05/26/23 09:27	06/12/23 12:27	7439-89-6	
Magnesium	**8860**	ug/L	50.0	20.1	1	05/26/23 09:27	06/12/23 12:27	7439-95-4	
Manganese	**572**	ug/L	5.0	0.39	1	05/26/23 09:27	06/12/23 12:27	7439-96-5	
Potassium	**7950**	ug/L	500	69.7	1	05/26/23 09:27	06/12/23 12:27	7440-09-7	
Sodium	**105000**	ug/L	500	115	1	05/26/23 09:27	06/12/23 12:27	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**224**	mg/L	20.0	10.5	1		05/31/23 18:37		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**693**	mg/L	10.0	10.0	1		05/30/23 13:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**27.0**	mg/L	20.0	10.5	20		06/15/23 20:26	16887-00-6	
Fluoride	**0.20**	mg/L	0.20	0.12	1		06/15/23 19:32	16984-48-8	D6
Sulfate	**251**	mg/L	20.0	11.0	20		06/15/23 20:26	14808-79-8	M1

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-5S **Lab ID: 60429254007** Collected: 05/23/23 12:40 Received: 05/24/23 04:46 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**40.6J**	ug/L	100	6.4	1	05/26/23 09:27	06/12/23 12:34	7440-42-8	
Calcium	**153000**	ug/L	200	26.9	1	05/26/23 09:27	06/12/23 12:34	7440-70-2	
Iron	**40.2J**	ug/L	50.0	9.1	1	05/26/23 09:27	06/12/23 12:34	7439-89-6	
Magnesium	**14000**	ug/L	50.0	20.1	1	05/26/23 09:27	06/12/23 12:34	7439-95-4	
Manganese	**7.1**	ug/L	5.0	0.39	1	05/26/23 09:27	06/12/23 12:34	7439-96-5	
Potassium	**3400**	ug/L	500	69.7	1	05/26/23 09:27	06/12/23 12:34	7440-09-7	
Sodium	**9380**	ug/L	500	115	1	05/26/23 09:27	06/12/23 12:34	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**445**	mg/L	20.0	10.5	1		05/31/23 18:48		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**503**	mg/L	10.0	10.0	1		05/30/23 13:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**4.9**	mg/L	1.0	0.53	1		06/15/23 21:46	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/23 21:46	16984-48-8	
Sulfate	**8.5**	mg/L	1.0	0.55	1		06/15/23 21:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-DUP-1 **Lab ID: 60429254008** Collected: 05/23/23 00:00 Received: 05/24/23 04:46 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**40.7J**	ug/L	100	6.4	1	05/26/23 09:27	06/12/23 12:36	7440-42-8	
Calcium	**154000**	ug/L	200	26.9	1	05/26/23 09:27	06/12/23 12:36	7440-70-2	
Iron	**40.0J**	ug/L	50.0	9.1	1	05/26/23 09:27	06/12/23 12:36	7439-89-6	
Magnesium	**14200**	ug/L	50.0	20.1	1	05/26/23 09:27	06/12/23 12:36	7439-95-4	
Manganese	**7.4**	ug/L	5.0	0.39	1	05/26/23 09:27	06/12/23 12:36	7439-96-5	
Potassium	**3400**	ug/L	500	69.7	1	05/26/23 09:27	06/12/23 12:36	7440-09-7	
Sodium	**9350**	ug/L	500	115	1	05/26/23 09:27	06/12/23 12:36	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**447**	mg/L	20.0	10.5	1		05/31/23 18:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**505**	mg/L	10.0	10.0	1		05/30/23 13:32		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**4.9**	mg/L	1.0	0.53	1		06/15/23 22:13	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/23 22:13	16984-48-8	
Sulfate	**8.5**	mg/L	1.0	0.55	1		06/15/23 22:13	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-1S **Lab ID: 60428743003** Collected: 05/12/23 09:04 Received: 05/13/23 04:43 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**930**	ug/L	100	6.4	1	05/16/23 14:40	06/01/23 11:52	7440-42-8	
Calcium	**109000**	ug/L	200	26.9	1	05/16/23 14:40	06/01/23 11:52	7440-70-2	
Iron	**430**	ug/L	50.0	9.1	1	05/16/23 14:40	06/01/23 11:52	7439-89-6	
Magnesium	**18800**	ug/L	50.0	20.1	1	05/16/23 14:40	06/01/23 11:52	7439-95-4	
Manganese	**587**	ug/L	5.0	0.39	1	05/16/23 14:40	06/01/23 11:52	7439-96-5	
Potassium	**3440**	ug/L	500	69.7	1	05/16/23 14:40	06/01/23 11:52	7440-09-7	
Sodium	**7040**	ug/L	500	115	1	05/16/23 14:40	06/01/23 11:52	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**327**	mg/L	20.0	10.5	1		05/17/23 15:21		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**597**	mg/L	10.0	10.0	1		05/19/23 11:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**4.6**	mg/L	1.0	0.53	1		05/31/23 23:12	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/31/23 23:12	16984-48-8	L2
Sulfate	**40.3**	mg/L	10.0	5.5	10		06/01/23 11:27	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-2S **Lab ID: 60429254001** Collected: 05/19/23 10:54 Received: 05/20/23 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**3180**	ug/L	100	6.4	1	06/13/23 13:43	06/19/23 09:00	7440-42-8	
Calcium	**79600**	ug/L	200	26.9	1	06/13/23 13:43	06/19/23 09:00	7440-70-2	
Iron	**25.7J**	ug/L	50.0	9.1	1	06/13/23 13:43	06/19/23 09:00	7439-89-6	B
Magnesium	**104**	ug/L	50.0	20.1	1	06/13/23 13:43	06/19/23 09:00	7439-95-4	
Manganese	**1.6J**	ug/L	5.0	0.39	1	06/13/23 13:43	06/19/23 09:00	7439-96-5	B
Potassium	**9670**	ug/L	500	69.7	1	06/13/23 13:43	06/19/23 09:00	7440-09-7	
Sodium	**69900**	ug/L	500	115	1	06/13/23 13:43	06/19/23 09:00	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**44.6**	mg/L	20.0	10.5	1		05/24/23 13:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**567**	mg/L	10.0	10.0	1		05/25/23 12:06		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**14.6**	mg/L	1.0	0.53	1		06/13/23 20:50	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/23 20:50	16984-48-8	
Sulfate	**311**	mg/L	20.0	11.0	20		06/13/23 21:04	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-4S **Lab ID: 60428743024** Collected: 05/24/23 17:13 Received: 05/26/23 04:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**4580**	ug/L	100	6.4	1	05/31/23 09:57	06/07/23 09:05	7440-42-8	
Calcium	**163000**	ug/L	200	26.9	1	05/31/23 09:57	06/07/23 09:05	7440-70-2	M1
Iron	**5840**	ug/L	50.0	9.1	1	05/31/23 09:57	06/07/23 09:05	7439-89-6	
Magnesium	**27600**	ug/L	50.0	20.1	1	05/31/23 09:57	06/07/23 09:05	7439-95-4	
Manganese	**1430**	ug/L	5.0	0.39	1	05/31/23 09:57	06/07/23 09:05	7439-96-5	
Potassium	**6570**	ug/L	500	69.7	1	05/31/23 09:57	06/07/23 09:05	7440-09-7	
Sodium	**74700**	ug/L	500	115	1	05/31/23 09:57	06/07/23 09:05	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**414**	mg/L	20.0	10.5	1		06/02/23 11:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**767**	mg/L	10.0	10.0	1		05/31/23 13:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**66.0**	mg/L	20.0	10.5	20		06/18/23 22:14	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/18/23 22:00	16984-48-8	
Sulfate	**133**	mg/L	20.0	11.0	20		06/18/23 22:14	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-7S **Lab ID: 60429254003** Collected: 05/18/23 15:23 Received: 05/20/23 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**7890**	ug/L	100	6.4	1	06/13/23 13:43	06/19/23 09:06	7440-42-8	
Calcium	**161000**	ug/L	200	26.9	1	06/13/23 13:43	06/19/23 09:06	7440-70-2	
Iron	**3630**	ug/L	50.0	9.1	1	06/13/23 13:43	06/19/23 09:06	7439-89-6	
Magnesium	**36200**	ug/L	50.0	20.1	1	06/13/23 13:43	06/19/23 09:06	7439-95-4	
Manganese	**1580**	ug/L	5.0	0.39	1	06/13/23 13:43	06/19/23 09:06	7439-96-5	
Potassium	**7100**	ug/L	500	69.7	1	06/13/23 13:43	06/19/23 09:06	7440-09-7	
Sodium	**50800**	ug/L	500	115	1	06/13/23 13:43	06/19/23 09:06	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**431**	mg/L	20.0	10.5	1		05/24/23 12:32		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**800**	mg/L	10.0	10.0	1		05/24/23 09:11		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**18.7**	mg/L	1.0	0.53	1		06/13/23 14:10	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/23 14:10	16984-48-8	
Sulfate	**209**	mg/L	20.0	11.0	20		06/13/23 14:23	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-LMW-8S **Lab ID: 60429254004** Collected: 05/18/23 14:00 Received: 05/20/23 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**1050**	ug/L	100	6.4	1	06/13/23 13:43	06/19/23 09:14	7440-42-8	
Calcium	**81900**	ug/L	200	26.9	1	06/13/23 13:43	06/19/23 09:14	7440-70-2	
Iron	**742**	ug/L	50.0	9.1	1	06/13/23 13:43	06/19/23 09:14	7439-89-6	
Magnesium	**13200**	ug/L	50.0	20.1	1	06/13/23 13:43	06/19/23 09:14	7439-95-4	
Manganese	**48.1**	ug/L	5.0	0.39	1	06/13/23 13:43	06/19/23 09:14	7439-96-5	
Potassium	**3880**	ug/L	500	69.7	1	06/13/23 13:43	06/19/23 09:14	7440-09-7	
Sodium	**35300**	ug/L	500	115	1	06/13/23 13:43	06/19/23 09:14	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**302**	mg/L	20.0	10.5	1		05/24/23 12:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**400**	mg/L	10.0	10.0	1		05/24/23 09:12		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**1.6**	mg/L	1.0	0.53	1		06/13/23 14:36	16887-00-6	
Fluoride	**0.36**	mg/L	0.20	0.12	1		06/13/23 14:36	16984-48-8	
Sulfate	**44.7**	mg/L	20.0	11.0	20		06/13/23 14:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-BMW-1S **Lab ID: 60428743001** Collected: 05/11/23 13:22 Received: 05/13/23 04:43 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**88.2J**	ug/L	100	6.4	1	05/16/23 14:40	06/01/23 11:45	7440-42-8	
Calcium	**191000**	ug/L	200	26.9	1	05/16/23 14:40	06/01/23 11:45	7440-70-2	
Iron	**24700**	ug/L	50.0	9.1	1	05/16/23 14:40	06/01/23 11:45	7439-89-6	
Magnesium	**42900**	ug/L	50.0	20.1	1	05/16/23 14:40	06/01/23 11:45	7439-95-4	
Manganese	**2510**	ug/L	5.0	0.39	1	05/16/23 14:40	06/01/23 11:45	7439-96-5	
Potassium	**5060**	ug/L	500	69.7	1	05/16/23 14:40	06/01/23 11:45	7440-09-7	
Sodium	**15800**	ug/L	500	115	1	05/16/23 14:40	06/01/23 11:45	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**674**	mg/L	20.0	10.5	1		05/17/23 14:28		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**801**	mg/L	13.3	13.3	1		05/18/23 11:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.6**	mg/L	1.0	0.53	1		05/31/23 22:47	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/31/23 22:47	16984-48-8	L2
Sulfate	**65.9**	mg/L	10.0	5.5	10		06/01/23 11:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Sample: L-BMW-2S **Lab ID: 60428743002** Collected: 05/11/23 10:34 Received: 05/13/23 04:43 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**45.3J**	ug/L	100	6.4	1	05/16/23 14:40	06/01/23 11:49	7440-42-8	
Calcium	**141000**	ug/L	200	26.9	1	05/16/23 14:40	06/01/23 11:49	7440-70-2	
Iron	**12.9J**	ug/L	50.0	9.1	1	05/16/23 14:40	06/01/23 11:49	7439-89-6	B
Magnesium	**20900**	ug/L	50.0	20.1	1	05/16/23 14:40	06/01/23 11:49	7439-95-4	
Manganese	**1.3J**	ug/L	5.0	0.39	1	05/16/23 14:40	06/01/23 11:49	7439-96-5	B
Potassium	**5800**	ug/L	500	69.7	1	05/16/23 14:40	06/01/23 11:49	7440-09-7	
Sodium	**4580**	ug/L	500	115	1	05/16/23 14:40	06/01/23 11:49	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**408**	mg/L	20.0	10.5	1		05/17/23 14:47		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**607**	mg/L	10.0	10.0	1		05/18/23 11:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.2**	mg/L	1.0	0.53	1		05/31/23 23:00	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		05/31/23 23:00	16984-48-8	L2
Sulfate	**39.7**	mg/L	10.0	5.5	10		06/01/23 11:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 847355
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743001, 60428743002, 60428743003

METHOD BLANK: 3357531 Matrix: Water
Associated Lab Samples: 60428743001, 60428743002, 60428743003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/01/23 11:39	
Calcium	ug/L	28.4J	200	26.9	06/01/23 11:39	
Iron	ug/L	16.0J	50.0	9.1	06/01/23 11:39	
Magnesium	ug/L	<20.1	50.0	20.1	06/01/23 11:39	
Manganese	ug/L	1.9J	5.0	0.39	06/01/23 11:39	
Potassium	ug/L	<69.7	500	69.7	06/01/23 11:39	
Sodium	ug/L	<115	500	115	06/01/23 11:39	

LABORATORY CONTROL SAMPLE: 3357532

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1010	101	85-115	
Calcium	ug/L	10000	10900	109	85-115	
Iron	ug/L	10000	10800	108	85-115	
Magnesium	ug/L	10000	10700	107	85-115	
Manganese	ug/L	1000	942	94	85-115	
Potassium	ug/L	10000	10400	104	85-115	
Sodium	ug/L	10000	10600	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3357533 3357534

Parameter	Units	60428744001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1040	1000	1000	1970	1950	92	90	70-130	1	20	
Calcium	ug/L	118000	10000	10000	123000	122000	49	37	70-130	1	20	M1
Iron	ug/L	3580	10000	10000	13600	13400	100	98	70-130	1	20	
Magnesium	ug/L	25000	10000	10000	34100	33700	91	87	70-130	1	20	
Manganese	ug/L	409	1000	1000	1360	1360	95	95	70-130	0	20	
Potassium	ug/L	7650	10000	10000	17800	17500	101	98	70-130	2	20	
Sodium	ug/L	60900	10000	10000	68500	67700	76	68	70-130	1	20	M1

MATRIX SPIKE SAMPLE: 3357535

Parameter	Units	60428744007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	79.4J	1000	1070	99	70-130	
Calcium	ug/L	111000	10000	125000	144	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

MATRIX SPIKE SAMPLE: 3357535

Parameter	Units	60428744007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	22600	10000	33900	113	70-130	
Magnesium	ug/L	29900	10000	41500	117	70-130	
Manganese	ug/L	371	1000	1390	102	70-130	
Potassium	ug/L	4000	10000	14600	106	70-130	
Sodium	ug/L	13400	10000	24500	111	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849320
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254006, 60429254007, 60429254008

METHOD BLANK: 3364759 Matrix: Water
Associated Lab Samples: 60429254006, 60429254007, 60429254008

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

LABORATORY CONTROL SAMPLE: 3364760

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	967	97	85-115	
Calcium	ug/L	10000	10300	103	85-115	
Iron	ug/L	10000	10300	103	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	10200	102	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3364761 3364762

Parameter	Units	60429254006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	4300	1000	1000	5290	5200	99	90	70-130	2	20	
Calcium	ug/L	88400	10000	10000	98300	97100	99	87	70-130	1	20	
Iron	ug/L	5770	10000	10000	16100	15600	104	98	70-130	4	20	
Magnesium	ug/L	8860	10000	10000	18700	18400	98	96	70-130	1	20	
Manganese	ug/L	572	1000	1000	1560	1540	99	96	70-130	1	20	
Potassium	ug/L	7950	10000	10000	18400	17900	104	99	70-130	3	20	
Sodium	ug/L	105000	10000	10000	115000	113000	103	80	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849921
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743024

METHOD BLANK: 3366629 Matrix: Water
Associated Lab Samples: 60428743024

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/07/23 08:59	
Calcium	ug/L	<26.9	200	26.9	06/07/23 08:59	
Iron	ug/L	<9.1	50.0	9.1	06/07/23 08:59	
Magnesium	ug/L	<20.1	50.0	20.1	06/07/23 08:59	
Manganese	ug/L	0.79J	5.0	0.39	06/07/23 08:59	
Potassium	ug/L	<69.7	500	69.7	06/07/23 08:59	
Sodium	ug/L	<115	500	115	06/07/23 08:59	

LABORATORY CONTROL SAMPLE: 3366630

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	998	100	85-115	
Calcium	ug/L	10000	10600	106	85-115	
Iron	ug/L	10000	11100	111	85-115	
Magnesium	ug/L	10000	10400	104	85-115	
Manganese	ug/L	1000	1020	102	85-115	
Potassium	ug/L	10000	10200	102	85-115	
Sodium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3366631 3366632

Parameter	Units	60428743024 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	4580	1000	1000	5470	5560	89	97	70-130	2	20	
Calcium	ug/L	163000	10000	10000	170000	172000	69	89	70-130	1	20	M1
Iron	ug/L	5840	10000	10000	16500	17000	106	111	70-130	3	20	
Magnesium	ug/L	27600	10000	10000	37700	37800	101	102	70-130	0	20	
Manganese	ug/L	1430	1000	1000	2380	2410	95	98	70-130	1	20	
Potassium	ug/L	6570	10000	10000	17100	17400	106	108	70-130	1	20	
Sodium	ug/L	74700	10000	10000	84200	85200	95	105	70-130	1	20	

MATRIX SPIKE SAMPLE: 3366633

Parameter	Units	60428743025 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	9710	1000	10700	98	70-130	
Calcium	ug/L	110000	10000	120000	97	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

MATRIX SPIKE SAMPLE: 3366633

Parameter	Units	60428743025 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	5990	10000	16300	103	70-130	
Magnesium	ug/L	23000	10000	33500	105	70-130	
Manganese	ug/L	294	1000	1290	100	70-130	
Potassium	ug/L	7560	10000	18400	109	70-130	
Sodium	ug/L	99600	10000	110000	99	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 852043
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254001, 60429254002, 60429254003, 60429254004, 60429254005

METHOD BLANK: 3374470 Matrix: Water
Associated Lab Samples: 60429254001, 60429254002, 60429254003, 60429254004, 60429254005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/19/23 08:50	
Calcium	ug/L	46.0J	200	26.9	06/19/23 08:50	
Iron	ug/L	19.9J	50.0	9.1	06/19/23 08:50	
Magnesium	ug/L	<20.1	50.0	20.1	06/19/23 08:50	
Manganese	ug/L	0.53J	5.0	0.39	06/19/23 08:50	
Potassium	ug/L	<69.7	500	69.7	06/19/23 08:50	
Sodium	ug/L	<115	500	115	06/19/23 08:50	

LABORATORY CONTROL SAMPLE: 3374471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	2000	1840	92	85-115	
Calcium	ug/L	20000	19600	98	85-115	
Iron	ug/L	20000	19700	99	85-115	
Magnesium	ug/L	20000	19300	96	85-115	
Manganese	ug/L	2000	1950	97	85-115	
Potassium	ug/L	20000	18900	95	85-115	
Sodium	ug/L	20000	19300	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3374472 3374473

Parameter	Units	60429091008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	45.6J	2000	2000	1890	1950	92	95	70-130	3	20	
Calcium	ug/L	140000	20000	20000	163000	164000	114	123	70-130	1	20	
Iron	ug/L	13.5J	20000	20000	19300	19600	96	98	70-130	2	20	
Magnesium	ug/L	26000	20000	20000	45600	46700	98	104	70-130	2	20	
Manganese	ug/L	11.4	2000	2000	1830	1890	91	94	70-130	3	20	
Potassium	ug/L	3970	20000	20000	23400	24300	97	102	70-130	4	20	
Sodium	ug/L	4910	20000	20000	24700	25400	99	103	70-130	3	20	

MATRIX SPIKE SAMPLE: 3374474

Parameter	Units	60429254001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	3180	2000	4940	88	70-130	
Calcium	ug/L	79600	20000	95300	78	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

MATRIX SPIKE SAMPLE: 3374474

Parameter	Units	60429254001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	25.7J	20000	19100	95	70-130	
Magnesium	ug/L	104	20000	18700	93	70-130	
Manganese	ug/L	1.6J	2000	1880	94	70-130	
Potassium	ug/L	9670	20000	28600	94	70-130	
Sodium	ug/L	69900	20000	86400	82	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 847594
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743001, 60428743002, 60428743003

METHOD BLANK: 3358236 Matrix: Water
Associated Lab Samples: 60428743001, 60428743002, 60428743003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	05/17/23 13:59	

LABORATORY CONTROL SAMPLE: 3358237

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

SAMPLE DUPLICATE: 3358238

Parameter	Units	60428567001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	436	435	0	10	

SAMPLE DUPLICATE: 3358239

Parameter	Units	60428744001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	330	338	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 848809
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254001, 60429254002, 60429254003, 60429254004, 60429254005

METHOD BLANK: 3362800 Matrix: Water
Associated Lab Samples: 60429254001, 60429254002, 60429254003, 60429254004, 60429254005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	05/24/23 11:08	

LABORATORY CONTROL SAMPLE: 3362801

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

SAMPLE DUPLICATE: 3362802

Parameter	Units	10653909001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	491	488	1	10	

SAMPLE DUPLICATE: 3362803

Parameter	Units	60429254004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	302	310	3	10	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849897
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254006, 60429254007, 60429254008

METHOD BLANK: 3366540 Matrix: Water
Associated Lab Samples: 60429254006, 60429254007, 60429254008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	05/31/23 17:43	

LABORATORY CONTROL SAMPLE: 3366541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	461	92	90-110	

SAMPLE DUPLICATE: 3366542

Parameter	Units	60429379011 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	187	187	0	10	

SAMPLE DUPLICATE: 3366543

Parameter	Units	60429254006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	224	222	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 850364
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743024

METHOD BLANK: 3368319 Matrix: Water
Associated Lab Samples: 60428743024

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	06/02/23 09:48	

LABORATORY CONTROL SAMPLE: 3368320

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	490	98	90-110	

SAMPLE DUPLICATE: 3368321

Parameter	Units	60429414001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	389	390	0	10	

SAMPLE DUPLICATE: 3368322

Parameter	Units	60429499002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	92.4	89.5	3	10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 847756
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743001, 60428743002

METHOD BLANK: 3358896 Matrix: Water
Associated Lab Samples: 60428743001, 60428743002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/18/23 11:26	

LABORATORY CONTROL SAMPLE: 3358897

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1050	105	80-120	

SAMPLE DUPLICATE: 3358898

Parameter	Units	60428659001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	865	905	5	10	

SAMPLE DUPLICATE: 3358899

Parameter	Units	60428744001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	667	641	4	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 848073
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743003

METHOD BLANK: 3360160 Matrix: Water
Associated Lab Samples: 60428743003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/19/23 11:07	

LABORATORY CONTROL SAMPLE: 3360161

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

SAMPLE DUPLICATE: 3360162

Parameter	Units	60428661001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	245	230	6	10	

SAMPLE DUPLICATE: 3360163

Parameter	Units	60428794008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	619	606	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 848758
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254002, 60429254003, 60429254004, 60429254005

METHOD BLANK: 3362666 Matrix: Water
Associated Lab Samples: 60429254002, 60429254003, 60429254004, 60429254005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/24/23 09:08	

LABORATORY CONTROL SAMPLE: 3362667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1070	107	80-120	

SAMPLE DUPLICATE: 3362668

Parameter	Units	60429277005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	121	119	2	10	

SAMPLE DUPLICATE: 3362669

Parameter	Units	60429277006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1060	1050	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849038
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254001

METHOD BLANK: 3363629 Matrix: Water
Associated Lab Samples: 60429254001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/25/23 12:05	

LABORATORY CONTROL SAMPLE: 3363630

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	991	99	80-120	

SAMPLE DUPLICATE: 3363631

Parameter	Units	60429277007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1030	989	4	10	

SAMPLE DUPLICATE: 3363632

Parameter	Units	60428744014 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	<5.0	<5.0		10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849617
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254006, 60429254007

METHOD BLANK: 3365966 Matrix: Water
Associated Lab Samples: 60429254006, 60429254007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/30/23 13:27	

LABORATORY CONTROL SAMPLE: 3365967

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

SAMPLE DUPLICATE: 3365968

Parameter	Units	60429379009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1610	1590	1	10	

SAMPLE DUPLICATE: 3365969

Parameter	Units	60429254006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	693	677	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849619
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254008

METHOD BLANK: 3365973 Matrix: Water
Associated Lab Samples: 60429254008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/30/23 13:31	

LABORATORY CONTROL SAMPLE: 3365974

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120	

SAMPLE DUPLICATE: 3365975

Parameter	Units	60429254008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	505	500	1	10	

SAMPLE DUPLICATE: 3365976

Parameter	Units	60429592009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2820	2840	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849982
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743024

METHOD BLANK: 3366861 Matrix: Water
Associated Lab Samples: 60428743024

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/31/23 13:13	

LABORATORY CONTROL SAMPLE: 3366862

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	996	100	80-120	

SAMPLE DUPLICATE: 3366863

Parameter	Units	60428743023 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	569	551	3	10	

SAMPLE DUPLICATE: 3366864

Parameter	Units	60428743031 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	870	870	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 849825
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428743001, 60428743002, 60428743003

METHOD BLANK: 3366406 Matrix: Water
Associated Lab Samples: 60428743001, 60428743002, 60428743003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	05/31/23 19:13	
Fluoride	mg/L	<0.12	0.20	0.12	05/31/23 19:13	
Sulfate	mg/L	<0.55	1.0	0.55	05/31/23 19:13	

LABORATORY CONTROL SAMPLE: 3366407

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	91	90-110	
Fluoride	mg/L	2.5	2.2	88	90-110	L2
Sulfate	mg/L	5	5.2	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3366408 3366409

Parameter	Units	60428744001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	40.4	100	100	111	109	71	69	80-120	2	15	M1
Fluoride	mg/L	<0.12	2.5	2.5	1.8	1.8	73	73	80-120	1	15	M0
Sulfate	mg/L	172	100	100	264	259	92	87	80-120	2	15	

SAMPLE DUPLICATE: 3366410

Parameter	Units	60428744001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	40.4	33.3	19	15	D6
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	172	165	4	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 851544
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254002, 60429254003, 60429254004, 60429254005

METHOD BLANK: 3372729 Matrix: Water
Associated Lab Samples: 60429254002, 60429254003, 60429254004, 60429254005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/13/23 09:55	
Fluoride	mg/L	<0.12	0.20	0.12	06/13/23 09:55	
Sulfate	mg/L	<0.55	1.0	0.55	06/13/23 09:55	

LABORATORY CONTROL SAMPLE: 3372730

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3372731 3372732

Parameter	Units	60430287001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	158	5	5	159	159	18	21	80-120	0	15	E,M1
Fluoride	mg/L	<0.20	2.5	2.5	2.8	2.6	107	103	80-120	4	15	
Sulfate	mg/L	723	5	5	727	731	83	159	80-120	1	15	E,M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 851545
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60429254001

METHOD BLANK: 3372733 Matrix: Water
Associated Lab Samples: 60429254001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/13/23 18:23	
Fluoride	mg/L	<0.12	0.20	0.12	06/13/23 18:23	
Sulfate	mg/L	<0.55	1.0	0.55	06/13/23 18:23	

LABORATORY CONTROL SAMPLE: 3372734

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	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3372735 3372736

Parameter	Units	60430373004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.0	5	5	5.5	5.7	90	94	80-120	4	15	
Fluoride	mg/L	1.1	2.5	2.5	3.8	3.9	107	111	80-120	3	15	
Sulfate	mg/L	742	500	500	1320	1240	116	99	80-120	7	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 852379
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429254006, 60429254007, 60429254008

METHOD BLANK: 3375535 Matrix: Water
Associated Lab Samples: 60429254006, 60429254007, 60429254008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/15/23 08:30	
Fluoride	mg/L	<0.12	0.20	0.12	06/15/23 08:30	
Sulfate	mg/L	<0.55	1.0	0.55	06/15/23 08:30	

LABORATORY CONTROL SAMPLE: 3375536

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	96	90-110	
Sulfate	mg/L	5	4.7	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3375539 3375537

Parameter	Units	60429254006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	27.0	100	100	115	115	88	88	80-120	1	15	
Fluoride	mg/L	0.20	2.5	2.5	2.9	2.8	107	104	80-120	3	15	
Sulfate	mg/L	251	100	100	329	330	78	79	80-120	0	15	M1

SAMPLE DUPLICATE: 3375538

Parameter	Units	60429254006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	27.0	25.4	6	15	
Fluoride	mg/L	0.20	0.24	16	15	D6
Sulfate	mg/L	251	229	9	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

QC Batch: 852884
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60428743024

METHOD BLANK: 3377816 Matrix: Water
Associated Lab Samples: 60428743024

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/18/23 12:32	
Fluoride	mg/L	<0.12	0.20	0.12	06/18/23 12:32	
Sulfate	mg/L	<0.55	1.0	0.55	06/18/23 12:32	

LABORATORY CONTROL SAMPLE: 3377817

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	96	90-110	
Sulfate	mg/L	5	4.7	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3377818 3377819

Parameter	Units	60430518007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	173	100	100	268	268	95	95	80-120	0	15	
Fluoride	mg/L	ND	50	50	48.2	48.0	96	96	80-120	0	15	
Sulfate	mg/L	ND	100	100	107	105	94	93	80-120	2	15	

MATRIX SPIKE SAMPLE: 3377820

Parameter	Units	60430570005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	220	100	323	102	80-120	
Fluoride	mg/L	ND	25	24.7	99	80-120	
Sulfate	mg/L	82.1	50	133	102	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60428743001	**L-BMW-1S**	EPA 200.7	847355	EPA 200.7	847429
60428743002	**L-BMW-2S**	EPA 200.7	847355	EPA 200.7	847429
60428743003	**L-LMW-1S**	EPA 200.7	847355	EPA 200.7	847429
60429254001	**L-LMW-2S**	EPA 200.7	852043	EPA 200.7	852106
60429254002	**L-LMW-6S**	EPA 200.7	852043	EPA 200.7	852106
60429254003	**L-LMW-7S**	EPA 200.7	852043	EPA 200.7	852106
60429254004	**L-LMW-8S**	EPA 200.7	852043	EPA 200.7	852106
60429254005	**L-LMW-FB-1**	EPA 200.7	852043	EPA 200.7	852106
60429254006	**L-LMW-3S**	EPA 200.7	849320	EPA 200.7	849454
60429254007	**L-LMW-5S**	EPA 200.7	849320	EPA 200.7	849454
60429254008	**L-LMW-DUP-1**	EPA 200.7	849320	EPA 200.7	849454
60428743024	**L-LMW-4S**	EPA 200.7	849921	EPA 200.7	849977
60428743001	**L-BMW-1S**	SM 2320B	847594		
60428743002	**L-BMW-2S**	SM 2320B	847594		
60428743003	**L-LMW-1S**	SM 2320B	847594		
60429254001	**L-LMW-2S**	SM 2320B	848809		
60429254002	**L-LMW-6S**	SM 2320B	848809		
60429254003	**L-LMW-7S**	SM 2320B	848809		
60429254004	**L-LMW-8S**	SM 2320B	848809		
60429254005	**L-LMW-FB-1**	SM 2320B	848809		
60429254006	**L-LMW-3S**	SM 2320B	849897		
60429254007	**L-LMW-5S**	SM 2320B	849897		
60429254008	**L-LMW-DUP-1**	SM 2320B	849897		
60428743024	**L-LMW-4S**	SM 2320B	850364		
60428743001	**L-BMW-1S**	SM 2540C	847756		
60428743002	**L-BMW-2S**	SM 2540C	847756		
60428743003	**L-LMW-1S**	SM 2540C	848073		
60429254001	**L-LMW-2S**	SM 2540C	849038		
60429254002	**L-LMW-6S**	SM 2540C	848758		
60429254003	**L-LMW-7S**	SM 2540C	848758		
60429254004	**L-LMW-8S**	SM 2540C	848758		
60429254005	**L-LMW-FB-1**	SM 2540C	848758		
60429254006	**L-LMW-3S**	SM 2540C	849617		
60429254007	**L-LMW-5S**	SM 2540C	849617		
60429254008	**L-LMW-DUP-1**	SM 2540C	849619		
60428743024	**L-LMW-4S**	SM 2540C	849982		
60428743001	**L-BMW-1S**	EPA 300.0	849825		
60428743002	**L-BMW-2S**	EPA 300.0	849825		
60428743003	**L-LMW-1S**	EPA 300.0	849825		
60429254001	**L-LMW-2S**	EPA 300.0	851545		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LCPB-Revised Report
Pace Project No.: 60429254

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60429254002	**L-LMW-6S**	EPA 300.0	851544		
60429254003	**L-LMW-7S**	EPA 300.0	851544		
60429254004	**L-LMW-8S**	EPA 300.0	851544		
60429254005	**L-LMW-FB-1**	EPA 300.0	851544		
60429254006	**L-LMW-3S**	EPA 300.0	852379		
60429254007	**L-LMW-5S**	EPA 300.0	852379		
60429254008	**L-LMW-DUP-1**	EPA 300.0	852379		
60428743024	**L-LMW-4S**	EPA 300.0	852884		

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sample	WO#: 60429254
	Revision: 2	Effective Date: 01/12/2022

Client Name: Rocksmith

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

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

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

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

Thermometer Used: IR99 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 16.6 **Corr. Factor** +0.2 **Corrected** 16.8

Temperature should be above freezing to 6°C 1.6, 1.2 1.2, 1.1

Date and initials of person examining contents:

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	cooler w/ 16.8 temp had only
Samples arrived within holding time:	☑Yes ☐No ☐N/A	Radium
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☐Yes ☑No ☐N/A	Receive BPJC For 8S sulfide
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#: 67187, 62071	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added. 65599, 55200
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☑No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☑No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	Rocksmith Geoengineers, LLC.
Address:	5233 Roanoke Drive
	St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone: 314-974-6578	Fax:
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	AMEREN LCPB
Project Number:	COC #3

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15857, line 1

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Chloride/Fluoride/Sulfate	App III and Cat/An Metals*	Alkalinity	TDS	Appendix IV Metals **	Mercury	Radium 226/Radium 228	Ferrous/Ferric Iron	SM4500-S2D Sulfide	UWL Metals***	COD/TOC	TOX	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Requested Analysis Filtered (Y/N)																	N	N	N	N	N	N	N	N	N	N	N	N	
1	L-LMW-1S	WT	G																											
2	L-LMW-2S	WT	G			5-19-23	1054		6	1	2	3							✓	✓	✓	✓	✓	✓		✓	✓	✓		
3	L-LMW-3S	WT	G																											
4	L-LMW-4S	WT	G																											
5	L-LMW-5S	WT	G																											
6	L-LMW-6S	WT	G			5-18-23	1710		6	1	2	3							✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		
7	L-LMW-7S	WT	G			"	1523		6	1	2	3							✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		
8	L-LMW-8S	WT	G			"	1400		6	1	2	3							✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		
9	L-BMW-1S	WT	G																											
10	L-BMW-2S	WT	G																											
11	L-LMW-DUP-1	WT	G																											
12	L-LMW-FB-1	WT	G			5-18-23	1725		6	1	2	3							✓	✓	✓	✓	✓	✓		✓	✓	✓		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
App III and Cat/An Metals - EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	Grant Marcy / Rocksmith	5-19-23	1600		5-20-23	0440	1.6.8	N	Y	Y
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl							1.2	Y	Y	Y
***Al, Cu, Ni, Ag, Zn + Hardness							1.4	Y	Y	Y
Radium 226/228 to Pace PA										

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Marcy

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/19/23

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

Client: Rock Smith Profile #:

Site: Ameren LCPS COC # J Notes: For 8S log BP3C for sulfide

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other	AG2S
1																															
2	WT												1						1		1	2	1				1				1
3																															
4																															
5																															
6	WT												1						1			2	1				1				1
7	WT												1						1			2	1				1				1
8	WT												1						1			2	1			1					1
9																															
10																															
11																															
12	WT												1						1			2					1				

Container Codes

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

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

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

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

Work Order Number:

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	Rocksmith Geoengineers, LLC.
Address:	5233 Roanoke Drive
	St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone: 314-974-6578	Fax:
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	AMEREN LCPB
Project Number:	COC #3

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15857, line 1

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Appendix IV Metals **	Mercury	Radium 226/Radium 228	Ferrous/Ferric Iron	SM4500-S2D Sulfide	UWL Metals***	COD/TOC	TOX	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-LMW-1S	WT	G			5-12-23	0904		8	2	2	3		1				N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2	L-LMW-2S	WT	G															N													
3	L-LMW-3S	WT	G															N													
4	L-LMW-4S	WT	G															N													
5	L-LMW-5S	WT	G															N													
6	L-LMW-6S	WT	G															N													
7	L-LMW-7S	WT	G															N													
8	L-LMW-8S	WT	G															N													
9	L-BMW-1S	WT	G			5-11-23	1322		8	2	2	3		1				N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
10	L-BMW-2S	WT	G			1	1034		8	2	2	3		1				N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
11	L-LMW-DUP-1	WT	G															N													
12	L-LMW-FB-1	WT	G															N													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
App III and Cat/An Metals - EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	Grant Morey / WSP	5-12-23	1530				
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl							
***Al, Cu, Ni, Ag, Zn + Hardness							
Radium 226/228 to Pace PA							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: Grant Morey

DATE Signed (MM/DD/YY): 05/12/23

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

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

WO# : 60429254

60429254

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

Client Name: Rocksmith Geoeng

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: T249 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 1.5/1.9/1.7 Corr. Factor +0.2 Corrected 1.7/2.1/1.9

2.2/17.3/19.1

Temperature should be above freezing to 6°C 2.0/19.1/18.9

Date and initials of person examining contents: pv 5/24/23

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#: 67181/62071	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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Address:	5233 Roanoke Drive
	St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone: 314-974-6578	Fax:
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	AMEREN LCPB
Project Number:	COC #3

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15857, line 1

REGULATORY AGENCY

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

Site Location STATE: MO

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

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Chloride/Fluoride/Sulfate	App III and Cat/An Metals*	Alkalinity	TDS	Appendix IV Metals**	Mercury	Radium 226/Radium 228	Ferrous/Ferric Iron	SM4500-S2D Sulfide	UWL Metals***	COD/TOC	TOX	Residual Chlorine (Y/N)	Pace Project No./Lab I.D.
																			N	N	N	N	N	N	N	N	N	N	N	N	
1	L-LMW-1S	WT	G																											60429254
2	L-LMW-2S	WT	G																											
3	L-LMW-3S	WT	G			5-23-23	1036		6	1	2	3							✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		
4	L-LMW-4S	WT	G																											
5	L-LMW-5S	WT	G			5-23-23	1240		6	1	2	3																		
6	L-LMW-6S	WT	G																											
7	L-LMW-7S	WT	G																											
8	L-LMW-8S	WT	G																											
9	L-BMW-1S	WT	G																											
10	L-BMW-2S	WT	G																											
11	L-LMW-DUP-1	WT	G			5-23-23	—		6	1	2	3							✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		
12	L-LMW-FB-1	WT	G																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
App III and Cat/An Metals - EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	Grant Morey / Rocksmith	5-23-23	1530		5/24	0446
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl						
***Al, Cu, Ni, Ag, Zn + Hardness						
Radium 226/228 to Pace PA						

SAMPLE CONDITIONS				
		Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Temp: 1.7	Y	Y	Y	
2.1				
1.9				
2.2				
1.3	N			
1.1				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: Grant Morey

DATE Signed (MM/DD/YY): 05/23/23

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

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 of 2

Section A Required Client Information:

Company:	Rocksmith Geoengineers, LLC.
Address:	5233 Roanoke Drive
	St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone:	314-974-6578 Fax:
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	AMEREN LCPB
Project Number:	COC #3

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15857, line 1

REGULATORY AGENCY

NPDES	GROUND WATER	DRINKING WATER
UST	RCRA	OTHER ______

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

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

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

Requested Analysis Filtered (Y/N): N for all analyses

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Chloride/Fluoride/Sulfate	App III and Cat/An Metals*	Alkalinity	TDS	Appendix IV Metals **	Mercury	Radium 226/Radium 228	Ferrous/Ferric Iron	SM4500-S2D Sulfide	UWL Metals***	COD/TOC	TOX	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60429254
1	L-LMW-MS-1	WT	G			5-23-23	1036		6	1	2	3							✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		Collected @ L-LMW-3S
2	L-LMW-MSD-1	WT	G			5-23-23	1036		6	1	2	3							✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		⊥
3		WT	G																													
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																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
App III and Cat/An Metals - EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	Grant Morey / Rocksmith	5-23-23	1530	[signature]	5/24	0446	1.7	Y	Y	Y
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl							2.1	↓	↓	↓
***Al, Cu, Ni, Ag, Zn + Hardness							1.9	↓	↓	↓
Radium 226/228 to Pace PA							2.2	↓	↓	↓
							12.3 / 19.1	N		

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/23/23

DC#_Title: ENV-FRM-LENE-0001_Sample Container Count
Revision: 3 | Effective Date: | Issued by: Lenexa

1/2

Client: Rocksmith Geoeng

Profile # Append to 60429254

Site:

Notes BP1N = Radium / AG2S = SI. 21 WET

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other	AG2S
1																															
2																															
3	WT												3						3			2	3								3	
4																															
5	WT												1						1			2	1								1	
6																															
7																															
8																															
9																															
10																															
11	WT												1						1			2	1								1	
12																															

Container Codes

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

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

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

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

Work Order Number: 60429254

2/2

Client: Locksmith Geoeng

Profile # Append to 60429254

Site:

Notes BP1N = Radium

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1	WT																					2										
2	WT																					2										
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Container Codes

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

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

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

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

Work Order Number: 60429254

WO# : 60429254

60429254

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Doc

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

Page: 1 of 1

Section A Required Client Information:

Company:	Rocksmith Geoengineers, LLC.
Address:	5233 Roanoke Drive
	St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone: 314-974-6578	Fax:
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	AMEREN LCPB
Project Number:	COC #3

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15857, line 1

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Chloride/Fluoride/Sulfate	App III and Cat/An Metals*	Alkalinity	TDS	Appendix IV Metals **	Mercury	Radium 226/Radium 228	Ferrous/Ferric Iron	SM4500-S2D Sulfide	UWL Metals***	COD/TOC	TOX	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N	N	N	N	N	N	N	N	N	
1	~~L-LMW-MS-1~~	WT	G																												
2	~~L-LMW-MSD-1~~	WT	G																												
3	L-LMW-45	WT	G			5-24-23	1713		6	1	2	3							✓	✓	✓	✓	✓	✓			✓	✓	✓		
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																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
App III and Cat/An Metals - EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	Grant Morey/Rocksmith	5-25-23	1430				
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl							
***Al, Cu, Ni, Ag, Zn + Hardness							
Radium 226/228 to Pace PA							

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	Grant Morey		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY): 05/25/23				

Memorandum

January 30, 2024

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23007
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	Grant.Morey@Rocksmithgeo.com
RE:	**Data Validation Summary, Labadie Energy Center – LCPB – Data Package 60429254**		

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren LCPB
Project Number: 23007
Reviewer: G. Morey
Validation Date: 1/30/2024

Laboratory: Pace Analytical
SDG #: 60429254
Analytical Method (type and no.): EPA 200.7/200.8 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names L-LMW-6S, L-LMW-FB-1, L-LMW-3S, L-LMW-5S, L-LMW-DUP-1, L-LMW-MS-1, L-LMW-MSD-1, L-LMW-1S, L-LMW-2S, L-LMW-4S, L-LMW-7S, L-LMW-8S, L-BMW-1S, L-BMW-2S

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			5/11/2023 - 5/24/2023
b) Sampling team indicated?	x			GTM
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	No lab narrative.

Note Deficiencies: Revised report issued for only parameters required under the CCR rule.

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

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

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

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

Comments/Notes:

General:

Dilutions noted for chloride and/or sulfate in several samples.

Method Blanks:

3357531: calcium (28.4J), iron (16.0J), and manganese (1.9J). Associated with samples -001 through -003. Iron and manganese results at -002 < RL, qualified as non-detect at RL.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks (continued):

3366629: manganese (0.79J). Associated with sample -024. No qualification necessary, result > RL and 10x blank.

3374470: calcium (46.0J), iron (19.9J), manganese (0.53J). Associated with samples -001 through -005. Iron and manganese results at -001 and calcium result at -005 < RL, qualified as non-detect at RL's.

Field Blanks:

L-LMW-FB-1 @ L-LMW-6S: calcium (37.0J). No qualification necessary, result > RL and 10x blank.

Laboratory Control Samples:

3366407: LCS recovery low for fluoride, associated with samples -001 through -003. Results flagged with UJ.

Duplicates:

L-LMW-DUP-1 @ L-LMW-5S: All RPD's within control limits, no qualification necessary.

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

3366410: Lab DUP RPD exceeds limit for chloride, associated with unrelated sample, no qualification necessary.

3375538: Lab DUP RPD exceeds limit for fluoride, associated with sample -003, result qualified as estimate.

MS/MSD:

3357533/3357534: MS/MSD recovery low for calcium and sodium. Associated with unrelated sample, no qualification necessary.

3357535: MS recovery high for calcium, no MSD. Associated with unrelated sample, no qualification necessary.

3366631/3366632: MS recovery low for calcium, MSD recovery and RPD within control limits, no qualification necessary.

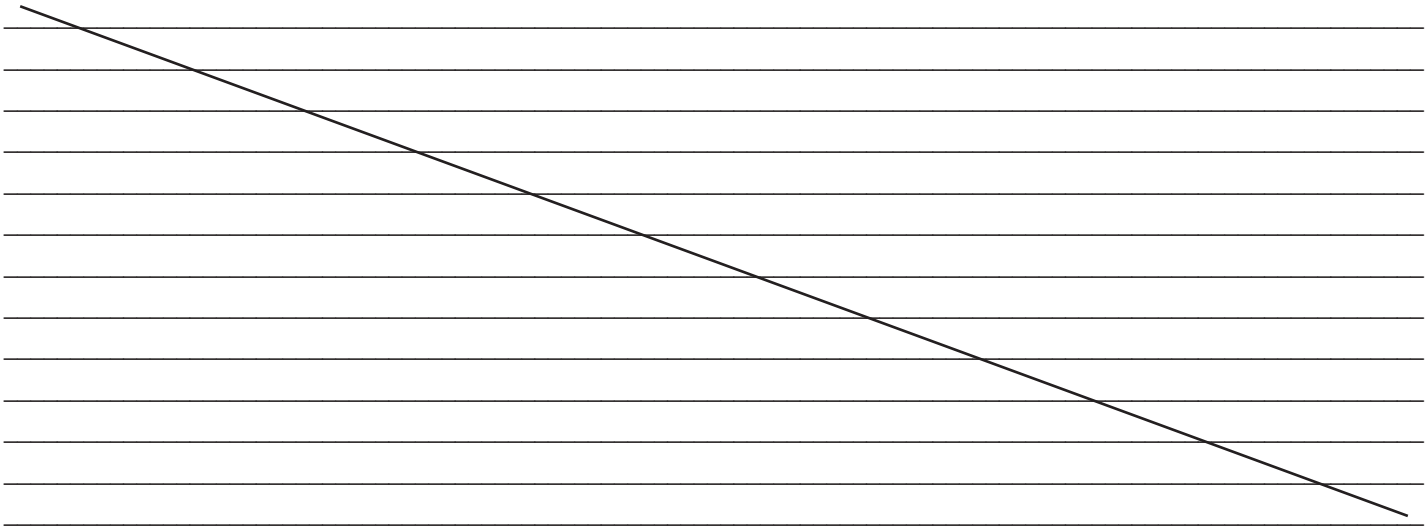
3366408/3366409: MS/MSD recoveries low for Chloride and Fluoride, associated with unrelated sample, no qualification necessary.

3372731/3372732: MS/MSD recoveries low for chloride, MSD recovery high for sulfate. Associated with unrelated sample, no qualification necessary.

3375539/3375537: MS/MSD recoveries low for sulfate. Associated with sample -006, result qualified as estimate.

3374552/3374553: Analyte concentration exceeded calibration range, associated with unrelated sample, no qualification necessary.

3375539/3375537: MS/MSD recovery low for sulfate. Associated with unrelated sample, no qualification necessary.



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-LMW-2S	Iron	50	U	Analyte detected in method blank, result < RL
"	Manganese	5.0	U	"
L-BMW-2S	Iron	50	U	"
"	Manganese	5.0	U	"
L-LMW-FB-1	Calcium	200	U	"
L-BMW-1S	Fluoride	0.12	UJ	LCS recovery low
L-BMW-2S	"	0.12	UJ	"
L-LMW-1S	"	0.12	UJ	"
L-LMW-3S	Fluoride	0.20	J	Lab DUP RPD exceeds limit
"	Sulfate	251	J-	MS/MSD recoveries low

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 1/30/2024

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

January 29, 2024

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

RE: Project: AMEREN LCPB
Pace Project No.: 60442425

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between November 18, 2023 and November 21, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

REV-1, 1/29/24: Parameters not required under the CCR rule removed.

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

Sincerely,

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

Enclosures

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

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CERTIFICATIONS

Project: AMEREN LCPB
Pace Project No.: 60442425

Pace Analytical Services Kansas

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

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SAMPLE SUMMARY

Project: AMEREN LCPB
Pace Project No.: 60442425

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60442425001	**L-LMW-5S**	Water	11/16/23 15:09	11/18/23 04:55
60442425002	**L-LMW-6S**	Water	11/15/23 13:05	11/18/23 04:55
60442425003	**L-LMW-DUP-1**	Water	11/15/23 08:00	11/18/23 04:55
60442425004	**L-LMW-MS-1**	Water	11/16/23 15:09	11/18/23 04:55
60442425005	**L-LMW-MSD-2**	Water	11/16/23 15:09	11/18/23 04:55
60442425006	**L-LMW-3S**	Water	11/20/23 13:09	11/21/23 06:02
60442425007	**L-LMW-FB-1**	Water	11/20/23 12:55	11/21/23 06:02
60442419002	**L-BMW-1S**	Water	11/16/23 08:50	11/18/23 04:55
60442419003	**L-BMW-2S**	Water	11/16/23 10:18	11/18/23 04:55
60442419004	**L-LMW-1S**	Water	11/16/23 10:06	11/18/23 04:55
60442419005	**L-LMW-4S**	Water	11/17/23 12:46	11/18/23 04:55
60442419006	**L-LMW-7S**	Water	11/15/23 15:39	11/18/23 04:55
60442419007	**L-LMW-8S**	Water	11/16/23 08:54	11/18/23 04:55
60442419027	**L-LMW-2S**	Water	11/20/23 09:12	11/21/23 06:02

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SAMPLE ANALYTE COUNT

Project: AMEREN LCPB
Pace Project No.: 60442425

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60442425001	**L-LMW-5S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442425002	**L-LMW-6S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442425003	**L-LMW-DUP-1**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442425006	**L-LMW-3S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442425007	**L-LMW-FB-1**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442419002	**L-BMW-1S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442419003	**L-BMW-2S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442419004	**L-LMW-1S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442419005	**L-LMW-4S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442419006	**L-LMW-7S**	EPA 200.7	JXD	7	PASI-K

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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SAMPLE ANALYTE COUNT

Project: AMEREN LCPB
Pace Project No.: 60442425

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442419007	**L-LMW-8S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	CRN2	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60442419027	**L-LMW-2S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	BMT	1	PASI-K
		SM 2540C	ZVF	1	PASI-K
		EPA 300.0	RKA	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Date: January 29, 2024

2e: Analysis performed at Pace Analytical STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042. TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389.

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: Rocksmith Geoengineering, LLC.
Date: January 29, 2024

General Information:
12 samples were analyzed for EPA 200.7 by Pace Analytical Services Kansas City. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 875680

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60442374001,60442419007

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

- MS (Lab ID: 3467997)
  - Potassium
- MSD (Lab ID: 3467998)
  - Potassium

QC Batch: 875737

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60442419016,60442423003,60442425003

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

- MS (Lab ID: 3468158)
  - Calcium

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Rocksmith Geoengineering, LLC.
Date: January 29, 2024

General Information:
12 samples were analyzed for SM 2320B by Pace Analytical Services Kansas City. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Rocksmith Geoengineering, LLC.
Date: January 29, 2024

General Information:
12 samples were analyzed for SM 2540C by Pace Analytical Services Kansas City. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the EPA method holding time.
- L-LMW-2S (Lab ID: 60442419027)
- L-LMW-6S (Lab ID: 60442425002)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 878803

1e: Achieving a constant weight was not met for this sample.
- L-LMW-6S (Lab ID: 60442425002)
  - Total Dissolved Solids

QC Batch: 878919

2e: See case narrative
- BLANK (Lab ID: 3481069)
  - Total Dissolved Solids
- L-BMW-1S (Lab ID: 60442419002)
  - Total Dissolved Solids
- L-BMW-2S (Lab ID: 60442419003)
  - Total Dissolved Solids
- L-LMW-1S (Lab ID: 60442419004)
  - Total Dissolved Solids
- L-LMW-4S (Lab ID: 60442419005)
  - Total Dissolved Solids

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Rocksmith Geoengineering, LLC.
Date: January 29, 2024

Analyte Comments:

QC Batch: 878919

2e: See case narrative

- L-LMW-7S (Lab ID: 60442419006)
  - Total Dissolved Solids
- L-LMW-8S (Lab ID: 60442419007)
  - Total Dissolved Solids
- LCS (Lab ID: 3481070)
  - Total Dissolved Solids

QC Batch: 878920

2e: See case narrative

- BLANK (Lab ID: 3481071)
  - Total Dissolved Solids
- L-LMW-5S (Lab ID: 60442425001)
  - Total Dissolved Solids
- L-LMW-DUP-1 (Lab ID: 60442425003)
  - Total Dissolved Solids
- LCS (Lab ID: 3481072)
  - Total Dissolved Solids

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: Rocksmith Geoengineering, LLC.
Date: January 29, 2024

General Information:
12 samples were analyzed for EPA 300.0 by Pace Analytical Services Kansas City. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 875610

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- LCS (Lab ID: 3467696)
  - Fluoride

QC Batch: 875787

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 3470527)
  - Fluoride

QC Batch: 875885

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 3471853)
  - Fluoride

QC Batch: 876922

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 3476789)
  - Fluoride

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 875610

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60442419012

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

- MS (Lab ID: 3467697)
  - Fluoride
  - Sulfate

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: Rocksmith Geoengineering, LLC.
Date: January 29, 2024

QC Batch: 875610

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60442419012

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

- MSD (Lab ID: 3467698)
  - Fluoride

QC Batch: 875787

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60442419016,60442420001,60442423003,60442425001

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

- MS (Lab ID: 3468421)
  - Fluoride
- MS (Lab ID: 3468424)
  - Sulfate
- MS (Lab ID: 3468427)
  - Sulfate
- MS (Lab ID: 3468430)
  - Fluoride
- MSD (Lab ID: 3468425)
  - Sulfate
- MSD (Lab ID: 3468428)
  - Sulfate
- MSD (Lab ID: 3468431)
  - Fluoride

R1: RPD value was outside control limits.

- MSD (Lab ID: 3468431)
  - Fluoride

QC Batch: 875885

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60441898004

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

- MSD (Lab ID: 3469022)
  - Fluoride

QC Batch: 876922

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60443033003

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

- MS (Lab ID: 3473233)
  - Chloride
- MSD (Lab ID: 3473234)
  - Chloride

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: AMEREN LCPB
Pace Project No.: 60442425

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: Rocksmith Geoengineering, LLC.
Date: January 29, 2024

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-5S **Lab ID: 60442425001** Collected: 11/16/23 15:09 Received: 11/18/23 04:55 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 Pace Analytical Services - Kansas City								
Boron	**55.0J**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 09:44	7440-42-8	
Calcium	**154000**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 09:44	7440-70-2	
Iron	**20.5J**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 09:44	7439-89-6	
Magnesium	**14600**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 09:44	7439-95-4	
Manganese	**8.6**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 09:44	7439-96-5	
Potassium	**3590**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 09:44	7440-09-7	
Sodium	**7500**	ug/L	500	115	1	12/05/23 10:23	12/06/23 09:44	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**447**	mg/L	20.0	10.5	1		11/27/23 14:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**434**	mg/L	17.0	17.0	1		11/22/23 18:57		2e
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.9**	mg/L	1.0	0.53	1		12/05/23 23:34	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/05/23 23:34	16984-48-8	L1
Sulfate	**7.9**	mg/L	1.0	0.55	1		12/05/23 23:34	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-6S **Lab ID: 60442425002** Collected: 11/15/23 13:05 Received: 11/18/23 04:55 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								
	Pace Analytical Services - Kansas City								
Boron	**806**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 09:20	7440-42-8	
Calcium	**131000**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 09:20	7440-70-2	
Iron	**6380**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 09:20	7439-89-6	
Magnesium	**23000**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 09:20	7439-95-4	
Manganese	**1110**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 09:20	7439-96-5	
Potassium	**5180**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 09:20	7440-09-7	
Sodium	**10600**	ug/L	500	115	1	12/05/23 10:23	12/06/23 09:20	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**417**	mg/L	20.0	10.5	1		11/24/23 16:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**479**	mg/L	10.0	10.0	1		12/29/23 14:10		1e,H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**3.2**	mg/L	1.0	0.53	1		12/06/23 00:42	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/06/23 00:42	16984-48-8	L1
Sulfate	**31.6**	mg/L	5.0	2.8	5		12/06/23 22:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-DUP-1 **Lab ID: 60442425003** Collected: 11/15/23 08:00 Received: 11/18/23 04:55 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 Pace Analytical Services - Kansas City								
Boron	**828**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 09:22	7440-42-8	
Calcium	**133000**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 09:22	7440-70-2	M1
Iron	**6510**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 09:22	7439-89-6	
Magnesium	**23400**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 09:22	7439-95-4	
Manganese	**1130**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 09:22	7439-96-5	
Potassium	**5300**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 09:22	7440-09-7	
Sodium	**10800**	ug/L	500	115	1	12/05/23 10:23	12/06/23 09:22	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**418**	mg/L	20.0	10.5	1		11/24/23 17:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**421**	mg/L	17.0	17.0	1		11/22/23 17:28		2e
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.2**	mg/L	1.0	0.53	1		12/06/23 01:05	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/06/23 01:05	16984-48-8	L1
Sulfate	**31.2**	mg/L	5.0	2.8	5		12/06/23 22:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-3S **Lab ID: 60442425006** Collected: 11/20/23 13:09 Received: 11/21/23 06:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**4220**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 10:30	7440-42-8	
Calcium	**109000**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 10:30	7440-70-2	
Iron	**12500**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 10:30	7439-89-6	
Magnesium	**15800**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 10:30	7439-95-4	
Manganese	**1300**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 10:30	7439-96-5	
Potassium	**6580**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 10:30	7440-09-7	
Sodium	**83000**	ug/L	500	115	1	12/05/23 10:23	12/06/23 10:30	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**315**	mg/L	20.0	10.5	1		11/30/23 11:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**671**	mg/L	45.3	45.3	1		11/27/23 13:49		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**21.1**	mg/L	5.0	2.6	5		12/09/23 01:12	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/07/23 22:42	16984-48-8	L1
Sulfate	**92.3**	mg/L	5.0	2.8	5		12/09/23 01:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-FB-1 **Lab ID: 60442425007** Collected: 11/20/23 12:55 Received: 11/21/23 06:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**9.2J**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 10:32	7440-42-8	
Calcium	**<26.9**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 10:32	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 10:32	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 10:32	7439-95-4	
Manganese	**0.60J**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 10:32	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 10:32	7440-09-7	
Sodium	**<115**	ug/L	500	115	1	12/05/23 10:23	12/06/23 10:32	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		11/30/23 11:47		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<17.0**	mg/L	17.0	17.0	1		11/27/23 13:49		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		12/07/23 23:05	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/07/23 23:05	16984-48-8	L1
Sulfate	**<0.55**	mg/L	1.0	0.55	1		12/07/23 23:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-BMW-1S **Lab ID: 60442419002** Collected: 11/16/23 08:50 Received: 11/18/23 04:55 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 Pace Analytical Services - Kansas City								
Boron	**113**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 10:44	7440-42-8	
Calcium	**208000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 10:44	7440-70-2	
Iron	**29900**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 10:44	7439-89-6	
Magnesium	**40600**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 10:44	7439-95-4	
Manganese	**2720**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 10:44	7439-96-5	
Potassium	**5770**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 10:44	7440-09-7	
Sodium	**13100**	ug/L	500	115	1	12/04/23 15:56	12/05/23 10:44	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**646**	mg/L	20.0	10.5	1		11/24/23 18:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**692**	mg/L	17.0	17.0	1		11/22/23 17:28		2e,B0
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**5.3**	mg/L	1.0	0.53	1		12/04/23 12:21	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/04/23 12:21	16984-48-8	L2
Sulfate	**72.4**	mg/L	10.0	5.5	10		12/04/23 12:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-BMW-2S **Lab ID: 60442419003** Collected: 11/16/23 10:18 Received: 11/18/23 04:55 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 Pace Analytical Services - Kansas City								
Boron	**50.8J**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 10:52	7440-42-8	
Calcium	**150000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 10:52	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 10:52	7439-89-6	
Magnesium	**23100**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 10:52	7439-95-4	
Manganese	**9.7**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 10:52	7439-96-5	
Potassium	**6920**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 10:52	7440-09-7	
Sodium	**4290**	ug/L	500	115	1	12/04/23 15:56	12/05/23 10:52	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**381**	mg/L	20.0	10.5	1		11/24/23 18:57		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**471**	mg/L	17.0	17.0	1		11/22/23 17:28		2e,B0
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.8**	mg/L	1.0	0.53	1		12/04/23 12:44	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/04/23 12:44	16984-48-8	L2
Sulfate	**38.3**	mg/L	10.0	5.5	10		12/04/23 12:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-1S **Lab ID: 60442419004** Collected: 11/16/23 10:06 Received: 11/18/23 04:55 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								
	Pace Analytical Services - Kansas City								
Boron	**1060**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 10:54	7440-42-8	
Calcium	**103000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 10:54	7440-70-2	
Iron	**348**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 10:54	7439-89-6	
Magnesium	**17400**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 10:54	7439-95-4	
Manganese	**504**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 10:54	7439-96-5	
Potassium	**3810**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 10:54	7440-09-7	
Sodium	**7330**	ug/L	500	115	1	12/04/23 15:56	12/05/23 10:54	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**298**	mg/L	20.0	10.5	1		11/24/23 19:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**348**	mg/L	17.0	17.0	1		11/22/23 17:28		2e,B0
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**4.0**	mg/L	1.0	0.53	1		12/04/23 13:07	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/04/23 13:07	16984-48-8	L2
Sulfate	**41.2**	mg/L	10.0	5.5	10		12/04/23 13:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-4S **Lab ID: 60442419005** Collected: 11/17/23 12:46 Received: 11/18/23 04:55 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 Pace Analytical Services - Kansas City								
Boron	**3470**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 10:56	7440-42-8	
Calcium	**178000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 10:56	7440-70-2	
Iron	**7670**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 10:56	7439-89-6	
Magnesium	**30200**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 10:56	7439-95-4	
Manganese	**1840**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 10:56	7439-96-5	
Potassium	**7080**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 10:56	7440-09-7	
Sodium	**61400**	ug/L	500	115	1	12/04/23 15:56	12/05/23 10:56	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**494**	mg/L	20.0	10.5	1		11/27/23 14:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**722**	mg/L	17.0	17.0	1		11/22/23 18:57		2e,B0
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**60.7**	mg/L	20.0	10.5	20		12/04/23 14:05	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/04/23 13:53	16984-48-8	L2
Sulfate	**116**	mg/L	20.0	11.0	20		12/04/23 14:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-7S **Lab ID: 60442419006** Collected: 11/15/23 15:39 Received: 11/18/23 04:55 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								
	Pace Analytical Services - Kansas City								
Boron	**6580**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 10:58	7440-42-8	
Calcium	**184000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 10:58	7440-70-2	
Iron	**4480**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 10:58	7439-89-6	
Magnesium	**38800**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 10:58	7439-95-4	
Manganese	**1490**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 10:58	7439-96-5	
Potassium	**7950**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 10:58	7440-09-7	
Sodium	**39600**	ug/L	500	115	1	12/04/23 15:56	12/05/23 10:58	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**481**	mg/L	20.0	10.5	1		11/24/23 16:04		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**607**	mg/L	17.0	17.0	1		11/22/23 17:28		2e,B0
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**13.5**	mg/L	1.0	0.53	1		12/04/23 14:17	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/04/23 14:17	16984-48-8	L2
Sulfate	**192**	mg/L	20.0	11.0	20		12/04/23 14:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-8S **Lab ID: 60442419007** Collected: 11/16/23 08:54 Received: 11/18/23 04:55 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								
	Pace Analytical Services - Kansas City								
Boron	**1550**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 11:00	7440-42-8	
Calcium	**118000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 11:00	7440-70-2	
Iron	**454**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 11:00	7439-89-6	
Magnesium	**18800**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 11:00	7439-95-4	
Manganese	**30.2**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 11:00	7439-96-5	
Potassium	**5380**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 11:00	7440-09-7	
Sodium	**38300**	ug/L	500	115	1	12/04/23 15:56	12/05/23 11:00	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**365**	mg/L	20.0	10.5	1		11/24/23 19:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**462**	mg/L	17.0	17.0	1		11/22/23 17:28		2e,B0
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**3.9**	mg/L	1.0	0.53	1		12/07/23 10:04	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/07/23 10:04	16984-48-8	L2
Sulfate	**79.2**	mg/L	20.0	11.0	20		12/07/23 10:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCPB
Pace Project No.: 60442425

Sample: L-LMW-2S **Lab ID: 60442419027** Collected: 11/20/23 09:12 Received: 11/21/23 06:02 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**3450**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 10:09	7440-42-8	
Calcium	**84300**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 10:09	7440-70-2	
Iron	**17.0J**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 10:09	7439-89-6	
Magnesium	**76.6**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 10:09	7439-95-4	
Manganese	**1.9J**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 10:09	7439-96-5	
Potassium	**10300**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 10:09	7440-09-7	
Sodium	**72700**	ug/L	500	115	1	12/05/23 10:23	12/06/23 10:09	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**39.2**	mg/L	20.0	10.5	1		11/29/23 13:16		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**533**	mg/L	10.0	10.0	1		12/29/23 14:11		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**15.0**	mg/L	1.0	0.53	1		12/14/23 18:56	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/14/23 18:56	16984-48-8	L1
Sulfate	**337**	mg/L	20.0	11.0	20		12/14/23 19:08	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875680
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419005, 60442419006, 60442419007

METHOD BLANK: 3467995 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419005, 60442419006, 60442419007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/05/23 10:27	
Calcium	ug/L	<26.9	200	26.9	12/05/23 10:27	
Iron	ug/L	<9.1	50.0	9.1	12/05/23 10:27	
Magnesium	ug/L	<20.1	50.0	20.1	12/05/23 10:27	
Manganese	ug/L	<0.39	5.0	0.39	12/05/23 10:27	
Potassium	ug/L	<69.7	500	69.7	12/05/23 10:27	
Sodium	ug/L	<115	500	115	12/05/23 10:27	

LABORATORY CONTROL SAMPLE: 3467996

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1000	100	85-115	
Calcium	ug/L	10000	10800	108	85-115	
Iron	ug/L	10000	10500	105	85-115	
Magnesium	ug/L	10000	10600	106	85-115	
Manganese	ug/L	1000	1060	106	85-115	
Potassium	ug/L	10000	10500	105	85-115	
Sodium	ug/L	10000	10700	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3467997 3467998

Parameter	Units	60442374001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	345	1000	1000	1310	1330	97	98	70-130	1	20	
Calcium	ug/L	16500	10000	10000	26800	27200	103	107	70-130	2	20	
Iron	ug/L	4260	10000	10000	14500	14900	103	107	70-130	3	20	
Magnesium	ug/L	9280	10000	10000	19300	19400	100	101	70-130	0	20	
Manganese	ug/L	1240	1000	1000	2230	2260	100	103	70-130	1	20	
Potassium	ug/L	662000	10000	10000	693000	710000	312	484	70-130	2	20	M1
Sodium	ug/L	59600	10000	10000	70800	71700	112	122	70-130	1	20	

MATRIX SPIKE SAMPLE: 3467999

Parameter	Units	60442419007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1550	1000	2550	100	70-130	
Calcium	ug/L	118000	10000	128000	102	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

MATRIX SPIKE SAMPLE: 3467999

Parameter	Units	60442419007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	454	10000	10900	104	70-130	
Magnesium	ug/L	18800	10000	28800	100	70-130	
Manganese	ug/L	30.2	1000	1070	104	70-130	
Potassium	ug/L	5380	10000	15800	105	70-130	
Sodium	ug/L	38300	10000	48600	103	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875737
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442425002, 60442425003

METHOD BLANK: 3468152 Matrix: Water
Associated Lab Samples: 60442425002, 60442425003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/06/23 08:45	
Calcium	ug/L	<26.9	200	26.9	12/06/23 08:45	
Iron	ug/L	<9.1	50.0	9.1	12/06/23 08:45	
Magnesium	ug/L	<20.1	50.0	20.1	12/06/23 08:45	
Manganese	ug/L	<0.39	5.0	0.39	12/06/23 08:45	
Potassium	ug/L	<69.7	500	69.7	12/06/23 08:45	
Sodium	ug/L	<115	500	115	12/06/23 08:45	

LABORATORY CONTROL SAMPLE: 3468153

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	976	98	85-115	
Calcium	ug/L	10000	10400	104	85-115	
Iron	ug/L	10000	10300	103	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1040	104	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468154 3468155

Parameter	Units	60442419016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	5040	1000	1000	6010	6060	97	103	70-130	1	20	
Calcium	ug/L	108000	10000	10000	117000	118000	97	99	70-130	0	20	
Iron	ug/L	7970	10000	10000	18200	18100	102	102	70-130	0	20	
Magnesium	ug/L	22900	10000	10000	32800	32900	99	101	70-130	1	20	
Manganese	ug/L	1270	1000	1000	2290	2300	102	102	70-130	0	20	
Potassium	ug/L	5310	10000	10000	15300	15500	100	102	70-130	1	20	
Sodium	ug/L	62400	10000	10000	72500	72600	101	102	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468156 3468157

Parameter	Units	60442423003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	114	1000	1000	1090	1090	98	98	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468156 3468157

Parameter	Units	60442423003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	145000	10000	10000	154000	155000	88	98	70-130	1	20	
Iron	ug/L	1220	10000	10000	11500	11500	102	102	70-130	0	20	
Magnesium	ug/L	30400	10000	10000	40200	40100	98	97	70-130	0	20	
Manganese	ug/L	1190	1000	1000	2220	2220	103	103	70-130	0	20	
Potassium	ug/L	5980	10000	10000	16000	16100	100	101	70-130	1	20	
Sodium	ug/L	6400	10000	10000	16500	16400	101	100	70-130	0	20	

MATRIX SPIKE SAMPLE: 3468158

Parameter	Units	60442425003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	828	1000	1770	94	70-130	
Calcium	ug/L	133000	10000	137000	42	70-130	M1
Iron	ug/L	6510	10000	16500	100	70-130	
Magnesium	ug/L	23400	10000	32100	87	70-130	
Manganese	ug/L	1130	1000	2120	99	70-130	
Potassium	ug/L	5300	10000	15000	97	70-130	
Sodium	ug/L	10800	10000	20500	96	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875741
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419027, 60442425001, 60442425006, 60442425007

METHOD BLANK: 3468169 Matrix: Water
Associated Lab Samples: 60442419027, 60442425001, 60442425006, 60442425007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/06/23 09:34	
Calcium	ug/L	<26.9	200	26.9	12/06/23 09:34	
Iron	ug/L	<9.1	50.0	9.1	12/06/23 09:34	
Magnesium	ug/L	<20.1	50.0	20.1	12/06/23 09:34	
Manganese	ug/L	<0.39	5.0	0.39	12/06/23 09:34	
Potassium	ug/L	<69.7	500	69.7	12/06/23 09:34	
Sodium	ug/L	<115	500	115	12/06/23 09:34	

LABORATORY CONTROL SAMPLE: 3468170

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	975	97	85-115	
Calcium	ug/L	10000	10400	104	85-115	
Iron	ug/L	10000	10500	105	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	1070	107	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468171 3468172

Parameter	Units	60442420001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1080	1000	1000	2060	2050	98	98	70-130	0	20	
Calcium	ug/L	128000	10000	10000	138000	135000	102	75	70-130	2	20	
Iron	ug/L	4050	10000	10000	14400	14300	104	103	70-130	1	20	
Magnesium	ug/L	26100	10000	10000	35800	35500	98	94	70-130	1	20	
Manganese	ug/L	471	1000	1000	1520	1510	105	104	70-130	0	20	
Potassium	ug/L	7760	10000	10000	17800	17800	101	101	70-130	0	20	
Sodium	ug/L	59200	10000	10000	68900	68100	97	88	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468173 3468174

Parameter	Units	60442425001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	55.0J	1000	1000	1040	1030	98	98	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468173 3468174

Parameter	Units	60442425001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	154000	10000	10000	163000	164000	91	105	70-130	1	20	
Iron	ug/L	20.5J	10000	10000	10500	10500	105	104	70-130	0	20	
Magnesium	ug/L	14600	10000	10000	24400	24600	98	100	70-130	1	20	
Manganese	ug/L	8.6	1000	1000	1060	1060	106	105	70-130	0	20	
Potassium	ug/L	3590	10000	10000	13900	13800	103	102	70-130	1	20	
Sodium	ug/L	7500	10000	10000	17700	17600	102	101	70-130	1	20	

MATRIX SPIKE SAMPLE: 3468175

Parameter	Units	60442419028 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	83.6J	1000	1060	98	70-130	
Calcium	ug/L	143000	10000	153000	108	70-130	
Iron	ug/L	13.1J	10000	10400	104	70-130	
Magnesium	ug/L	20900	10000	30700	98	70-130	
Manganese	ug/L	179	1000	1240	106	70-130	
Potassium	ug/L	31200	10000	41100	99	70-130	
Sodium	ug/L	2960	10000	13100	102	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 874660
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419006, 60442425002

METHOD BLANK: 3464259 Matrix: Water
Associated Lab Samples: 60442419006, 60442425002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/24/23 14:09	

LABORATORY CONTROL SAMPLE: 3464260

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	485	97	90-110	

SAMPLE DUPLICATE: 3464261

Parameter	Units	60442270019 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	257	260	1	10	

SAMPLE DUPLICATE: 3464262

Parameter	Units	60442419016 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	271	273	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 874661 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419007, 60442425003

METHOD BLANK: 3464263 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419007, 60442425003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/24/23 16:59	

LABORATORY CONTROL SAMPLE: 3464264

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	482	96	90-110	

SAMPLE DUPLICATE: 3464265

Parameter	Units	60442425003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	418	415	1	10	

SAMPLE DUPLICATE: 3464266

Parameter	Units	60442416001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	97.8	97.1	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 874727
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419005, 60442425001

METHOD BLANK: 3464569 Matrix: Water
Associated Lab Samples: 60442419005, 60442425001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/27/23 12:21	

LABORATORY CONTROL SAMPLE: 3464570

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	483	97	90-110	

SAMPLE DUPLICATE: 3464571

Parameter	Units	60442420001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	383	385	1	10	

SAMPLE DUPLICATE: 3464572

Parameter	Units	60442425001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	447	450	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875083
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60442419027

METHOD BLANK: 3465735 Matrix: Water
Associated Lab Samples: 60442419027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/29/23 10:42	

LABORATORY CONTROL SAMPLE: 3465736

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	486	97	90-110	

SAMPLE DUPLICATE: 3465737

Parameter	Units	60439754002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	266	264	1	10	H1

SAMPLE DUPLICATE: 3465738

Parameter	Units	60442466005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	403	405	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875206
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442425006, 60442425007

METHOD BLANK: 3466176 Matrix: Water
Associated Lab Samples: 60442425006, 60442425007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/30/23 10:31	

LABORATORY CONTROL SAMPLE: 3466177

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

SAMPLE DUPLICATE: 3466178

Parameter	Units	60442836001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	347	342	1	10	

SAMPLE DUPLICATE: 3466179

Parameter	Units	60442576002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	1790	1700	5	10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 874691
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442425006, 60442425007

METHOD BLANK: 3464490 Matrix: Water
Associated Lab Samples: 60442425006, 60442425007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<17.0	17.0	17.0	11/27/23 13:45	

LABORATORY CONTROL SAMPLE: 3464491

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

SAMPLE DUPLICATE: 3464492

Parameter	Units	60442420017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	<136	<136		10	

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 878803
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419027, 60442425002

METHOD BLANK: 3480675 Matrix: Water
Associated Lab Samples: 60442419027, 60442425002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	12/29/23 14:10	

LABORATORY CONTROL SAMPLE: 3480676

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120	

SAMPLE DUPLICATE: 3480677

Parameter	Units	60442425002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	479	480	0	10	H1

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 878919
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419005, 60442419006, 60442419007

METHOD BLANK: 3481069 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419005, 60442419006, 60442419007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	27.0	17.0	17.0	11/22/23 17:28	2e,B0

LABORATORY CONTROL SAMPLE: 3481070

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	898	90	80-120	2e,B0

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 878920
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442425001, 60442425003

METHOD BLANK: 3481071 Matrix: Water
Associated Lab Samples: 60442425001, 60442425003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<17.0	17.0	17.0	11/22/23 18:57	2e

LABORATORY CONTROL SAMPLE: 3481072

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	936	94	80-120	2e

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875610 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419005, 60442419006, 60442419007

METHOD BLANK: 3467695 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419005, 60442419006, 60442419007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/04/23 10:09	
Fluoride	mg/L	<0.12	0.20	0.12	12/04/23 10:09	
Sulfate	mg/L	<0.55	1.0	0.55	12/04/23 10:09	

METHOD BLANK: 3470828 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419004, 60442419005, 60442419006, 60442419007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/07/23 08:55	
Fluoride	mg/L	<0.12	0.20	0.12	12/07/23 08:55	
Sulfate	mg/L	<0.55	1.0	0.55	12/07/23 08:55	

LABORATORY CONTROL SAMPLE: 3467696

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	91	90-110	
Fluoride	mg/L	2.5	1.9	76	90-110	L2
Sulfate	mg/L	5	4.8	97	90-110	

LABORATORY CONTROL SAMPLE: 3470829

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	2.7	107	90-110	
Sulfate	mg/L	5	5.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3467697 3467698

Parameter	Units	60442419012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.0	5	5	18.4	18.7	108	115	80-120	2	15	
Fluoride	mg/L	<0.12	2.5	2.5	1.8	1.9	72	78	80-120	8	15	M1
Sulfate	mg/L	219	100	100	369	332	150	113	80-120	11	15	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

SAMPLE DUPLICATE: 3467699

Parameter	Units	60442419012 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	13.0	13.1	0	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	219	213	3	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875787
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442425001, 60442425002, 60442425003

METHOD BLANK: 3468419 Matrix: Water
Associated Lab Samples: 60442425001, 60442425002, 60442425003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/05/23 09:23	
Fluoride	mg/L	<0.12	0.20	0.12	12/05/23 09:23	
Sulfate	mg/L	<0.55	1.0	0.55	12/05/23 09:23	

METHOD BLANK: 3470526 Matrix: Water
Associated Lab Samples: 60442425001, 60442425002, 60442425003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/06/23 22:54	
Fluoride	mg/L	<0.12	0.20	0.12	12/06/23 22:54	
Sulfate	mg/L	<0.55	1.0	0.55	12/06/23 22:54	

METHOD BLANK: 3470833 Matrix: Water
Associated Lab Samples: 60442425001, 60442425002, 60442425003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/07/23 19:09	
Fluoride	mg/L	<0.12	0.20	0.12	12/07/23 19:09	
Sulfate	mg/L	<0.55	1.0	0.55	12/07/23 19:09	

LABORATORY CONTROL SAMPLE: 3468420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

LABORATORY CONTROL SAMPLE: 3470527

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.8	114	90-110	L1
Sulfate	mg/L	5	4.7	94	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

LABORATORY CONTROL SAMPLE: 3470834

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	2.7	107	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468421 3468422

Parameter	Units	60442420001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	27.2	25	25	51.3	50.2	96	92	80-120	2	15	
Fluoride	mg/L	<0.12	2.5	2.5	1.9	2.0	78	81	80-120	5	15	M1
Sulfate	mg/L	130	100	100	232	227	101	96	80-120	2	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468424 3468425

Parameter	Units	60442423003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.3	5	5	8.4	8.4	102	102	80-120	0	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.4	2.4	97	97	80-120	0	15	
Sulfate	mg/L	44.8	25	25	71.7	71.9	108	108	80-120	0	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468427 3468428

Parameter	Units	60442425001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.9	5	5	8.8	8.8	98	98	80-120	0	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.4	2.4	97	97	80-120	0	15	
Sulfate	mg/L	7.9	5	5	11.2	11.6	67	75	80-120	4	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468430 3468431

Parameter	Units	60442419016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	19.5	25	25	45.1	44.1	103	98	80-120	2	15	
Fluoride	mg/L	<0.12	2.5	2.5	1.7	1.4	68	58	80-120	16	15	M1,R1
Sulfate	mg/L	189	100	100	283	284	94	95	80-120	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

SAMPLE DUPLICATE: 3468423

Parameter	Units	60442420001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	27.2	27.4	1	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	130	125	4	15	

SAMPLE DUPLICATE: 3468426

Parameter	Units	60442423003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	3.3	3.5	4	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	44.8	45.7	2	15	

SAMPLE DUPLICATE: 3468429

Parameter	Units	60442425001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	3.9	3.9	0	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	7.9	7.6	3	15	

SAMPLE DUPLICATE: 3468432

Parameter	Units	60442419016 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	19.5	19.7	1	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	189	186	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 875885
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442425006, 60442425007

METHOD BLANK: 3469019 Matrix: Water
Associated Lab Samples: 60442425006, 60442425007

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

METHOD BLANK: 3471852 Matrix: Water
Associated Lab Samples: 60442425006, 60442425007

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

LABORATORY CONTROL SAMPLE: 3469020

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

LABORATORY CONTROL SAMPLE: 3471853

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3469021 3469022

Parameter	Units	60441898004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	23.8	25	25	48.4	48.2	99	98	80-120	0	15	H1
Fluoride	mg/L	0.15J	2.5	2.5	3.1	3.2	119	122	80-120	2	15	M1
Sulfate	mg/L	1.9	5	5	6.9	7.2	100	106	80-120	4	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

SAMPLE DUPLICATE: 3469023

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

QC Batch: 876922
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60442419027

METHOD BLANK: 3473231 Matrix: Water
Associated Lab Samples: 60442419027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/14/23 08:55	
Fluoride	mg/L	<0.12	0.20	0.12	12/14/23 08:55	
Sulfate	mg/L	<0.55	1.0	0.55	12/14/23 08:55	

METHOD BLANK: 3475667 Matrix: Water
Associated Lab Samples: 60442419027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/15/23 15:09	
Fluoride	mg/L	<0.12	0.20	0.12	12/15/23 15:09	
Sulfate	mg/L	<0.55	1.0	0.55	12/15/23 15:09	

METHOD BLANK: 3476788 Matrix: Water
Associated Lab Samples: 60442419027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/19/23 13:06	
Fluoride	mg/L	<0.12	0.20	0.12	12/19/23 13:06	
Sulfate	mg/L	<0.55	1.0	0.55	12/19/23 13:06	

LABORATORY CONTROL SAMPLE: 3473232

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	
Fluoride	mg/L	2.5	2.3	92	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

LABORATORY CONTROL SAMPLE: 3475668

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	2.3	93	90-110	
Sulfate	mg/L	5	5.3	105	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCPB
Pace Project No.: 60442425

LABORATORY CONTROL SAMPLE: 3476789

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	3.0	118	90-110	L1
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3473233 3473234

Parameter	Units	60443033003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	73.7	100	100	150	151	76	77	80-120	0	15	M1
Fluoride	mg/L	ND	50	50	45.6	46.6	91	93	80-120	2	15	
Sulfate	mg/L	81.6	100	100	172	172	91	91	80-120	0	15	

SAMPLE DUPLICATE: 3473235

Parameter	Units	60443033003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	73.7	72.4	2	15	
Fluoride	mg/L	ND	<2.5		15	
Sulfate	mg/L	81.6	80.1	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LCPB
Pace Project No.: 60442425

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1e	Achieving a constant weight was not met for this sample.
2e	See case narrative
B0	Analyte was detected in an associated blank at a concentration greater than the MDL.
H1	Analysis conducted outside the EPA method holding time.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LCPB
Pace Project No.: 60442425

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60442419002	**L-BMW-1S**	EPA 200.7	875680	EPA 200.7	875702
60442419003	**L-BMW-2S**	EPA 200.7	875680	EPA 200.7	875702
60442419004	**L-LMW-1S**	EPA 200.7	875680	EPA 200.7	875702
60442419005	**L-LMW-4S**	EPA 200.7	875680	EPA 200.7	875702
60442419006	**L-LMW-7S**	EPA 200.7	875680	EPA 200.7	875702
60442419007	**L-LMW-8S**	EPA 200.7	875680	EPA 200.7	875702
60442425001	**L-LMW-5S**	EPA 200.7	875741	EPA 200.7	875776
60442425002	**L-LMW-6S**	EPA 200.7	875737	EPA 200.7	875772
60442425003	**L-LMW-DUP-1**	EPA 200.7	875737	EPA 200.7	875772
60442419027	**L-LMW-2S**	EPA 200.7	875741	EPA 200.7	875776
60442425006	**L-LMW-3S**	EPA 200.7	875741	EPA 200.7	875776
60442425007	**L-LMW-FB-1**	EPA 200.7	875741	EPA 200.7	875776
60442419002	**L-BMW-1S**	SM 2320B	874661		
60442419003	**L-BMW-2S**	SM 2320B	874661		
60442419004	**L-LMW-1S**	SM 2320B	874661		
60442419005	**L-LMW-4S**	SM 2320B	874727		
60442419006	**L-LMW-7S**	SM 2320B	874660		
60442419007	**L-LMW-8S**	SM 2320B	874661		
60442425001	**L-LMW-5S**	SM 2320B	874727		
60442425002	**L-LMW-6S**	SM 2320B	874660		
60442425003	**L-LMW-DUP-1**	SM 2320B	874661		
60442419027	**L-LMW-2S**	SM 2320B	875083		
60442425006	**L-LMW-3S**	SM 2320B	875206		
60442425007	**L-LMW-FB-1**	SM 2320B	875206		
60442419002	**L-BMW-1S**	SM 2540C	878919		
60442419003	**L-BMW-2S**	SM 2540C	878919		
60442419004	**L-LMW-1S**	SM 2540C	878919		
60442419005	**L-LMW-4S**	SM 2540C	878919		
60442419006	**L-LMW-7S**	SM 2540C	878919		
60442419007	**L-LMW-8S**	SM 2540C	878919		
60442425001	**L-LMW-5S**	SM 2540C	878920		
60442425002	**L-LMW-6S**	SM 2540C	878803		
60442425003	**L-LMW-DUP-1**	SM 2540C	878920		
60442419027	**L-LMW-2S**	SM 2540C	878803		
60442425006	**L-LMW-3S**	SM 2540C	874691		
60442425007	**L-LMW-FB-1**	SM 2540C	874691		
60442419002	**L-BMW-1S**	EPA 300.0	875610		
60442419003	**L-BMW-2S**	EPA 300.0	875610		
60442419004	**L-LMW-1S**	EPA 300.0	875610		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LCPB
Pace Project No.: 60442425

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60442419005	**L-LMW-4S**	EPA 300.0	875610		
60442419006	**L-LMW-7S**	EPA 300.0	875610		
60442419007	**L-LMW-8S**	EPA 300.0	875610		
60442425001	**L-LMW-5S**	EPA 300.0	875787		
60442425002	**L-LMW-6S**	EPA 300.0	875787		
60442425003	**L-LMW-DUP-1**	EPA 300.0	875787		
60442419027	**L-LMW-2S**	EPA 300.0	876922		
60442425006	**L-LMW-3S**	EPA 300.0	875885		
60442425007	**L-LMW-FB-1**	EPA 300.0	875885		

WO# : 60442425

60442425

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

Client Name: Rocksmith Geoeng

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

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

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

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

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

Cooler Temperature (°C): As-read 0.9/14.2 Corr. Factor -0.3 Corrected 0.6/13.9

Date and initials of person examining contents: AV 11/21/23

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#: 67187	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

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

CHAIN-OF-CUSTODY Analytical Request Document

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

LAB USE ONLY- Affix Workorder/Login Label Here

Scan QR Code for instructions

60442425

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

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

County / State origin of sample(s): Missouri

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

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

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

DW PWSID # or WW Permit # as applicable:

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

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

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

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

Lab Use Only
Proj. Mgr: Jamie Church
AcctNum / Client ID:
Table #:
Profile / Template: 15857, Line 1
Prelog / Bottle Ord. ID: EZ 3011896

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res. Cl2	Number & Type of Containers Plastic	Number & Type of Containers Glass	Chloride/Fluoride/Sulfate	Alkalinity	TDS	App III and Cat/An Metals (200.7)*	Appendix IV Metals (200.7/200.8/7470)**	Radium 226 & Radium 228	***UWL Metals (200.7)	COD+TOC	TOX	Sample Comment	Preservation non-conformance identified for sample.
L-LMW-1S	WT																		log under LCPA-CA	
L-LMW-2S	WT	G	11-20-23	0912				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	log under LCPA-CA	
L-LMW-3S	WT	G	11-20-23	1309				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
L-LMW-4S	WT																		log under LCPA-CA	
L-LMW-5S	WT																			
L-LMW-6S	WT																			
L-LMW-7S	WT																		log under LCPA-CA	
L-LMW-8S	WT																		log under LCPA-CA	
L-BMW-1S	WT																		log under LCPA-CA	
L-BMW-2S	WT																		log under LCPA-CA	

Customer Remarks / Special Conditions / Possible Hazards:
* App III and Cat/An Metals* - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B
**App IV Metals -EPA 200.7: Ba,Be,Co,Pb, Li,Mo and 200.8 Metals - Sb, As, Cd, Cr, Se,Tl +7470 Hg
***UWL Metals - 200.7: Al, Cu, Ni, Ag, Zn

Collected By:
Printed Name: Grant Morey
Signature:

Additional Instructions from Pace®:

Coolers: 2 | Thermometer ID: T298 | Correction Factor (°C): -0.3 | Obs. Temp. (°C) | Corrected Temp. (°C): 0.6 / 13.9 per 11/21

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Rocksmith	11-20-23 / 1500	PAST	11/21/23 0602
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

Tracking Number:

Delivered by: [ ] In- Person [ ] Courier
[ ] FedEX [ ] UPS [ ] Other

Page: 1 of 2

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

CHAIN-OF-CUSTODY Analytical Request Document

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

LAB USE ONLY- Affix Workorder/Login Label Here

Scan QR Code for instructions

60442425

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

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

County / State origin of sample(s): Missouri

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

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

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

DW PWSID # or WW Permit # as applicable:

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

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

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

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res. Cl2	Number & Type of Containers: Plastic	Number & Type of Containers: Glass	Chloride/Fluoride/Sulfate	Alkalinity	TDS	App III and Cat/An Metals (200.7)*	Appendix IV Metals (200.7/200.8/7470)**	Radium 226 & Radium 228	***UWL Metals (200.7)	COD+TOC	TOX	Sample Comment
L-LMW-DUP-1*	WT																		
L-LMW-FB-1	WT	G	11-20-23	1255				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
L-LMW-MS-1	WT																		
L-LMW-MSD-1	WT																		

Specify Container Size **

Identify Container Preservative Type***

Analysis Requested

Lab Use Only
Proj. Mgr: Jamie Church
AcctNum / Client ID:
Table #:
Profile / Template: 15857, Line 1
Prelog / Bottle Ord. ID: EZ 3011896

Preservation non-conformance identified for sample.

Customer Remarks / Special Conditions / Possible Hazards:
* App III and Cat/An Metals* - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B
**App IV Metals - EPA 200.7: Ba,Be,Co,Pb, Li,Mo and 200.8 Metals - Sb, As, Cd, Cr, Se,Tl +7470 Hg
***UWL Metals - 200.7: Al, Cu, Ni, Ag, Zn

Collected By: Grant Morey
Printed Name:
Signature:

Additional Instructions from Pace®:

Coolers: 2 | Thermometer ID: T298 | Correction Factor (°C): -0.3 | Obs. Temp. (°C) | Corrected Temp (°C): 0.6/13.9

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Rocksmith	11-20-23/1500		11/21/23 0602
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

Tracking Number:

Delivered by: [ ] In- Person [ ] Courier
[ ] FedEX [ ] UPS [ ] Other

Page: 2 of 2

DC#_Title: ENV-FRM-LENE-0001_Sample Container Count
Revision: 3 | Effective Date: | Issued by: Lenexa

Only print what you log.

BP1N = SE-38RAD / RAD02.
AG2S = SE-21WET.

Client: ROCKSmith Geoeng

Profile # Do not log L-LMW-25.

Site:

Notes Append to 60442425

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other	AG2S	
1																																
2																	DO	NOT	LOG													
3	WT												1						1			2	1									
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12	WT												1						1			2	1								1	

Container Codes

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

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

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

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

Work Order Number: 60442425

1174

Internal Transfer Chain of Custody

Pace

☐ Rush Multiplier_____X
☐ Samples Pre-Logged into eCOC

State Of Origin: MO
Cert. Needed: ☐ Yes ☒ No

Workorder: 60442425 **Workorder Name:** AMEREN LCPB

Owner Received Date: 11/18/2023 **Results Requested By:** 12/6/2023

Report To	Subcontract To
Jamie Church Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 314-838-7223	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

L1680963

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: H2SO4	9020B Total Organic Halogens	LAB USE ONLY
1	L-LMW-5S	RQS	11/16/2023 12:46	60442425001	Water	3	X	MS/MSD -01
2	L-LMW-6S	PS	11/15/2023 13:05	60442425002	Water	1	X	-02
3	L-LMW-DUP-1	PS	11/15/2023 08:00	60442425003	Water	1	X	-03
4								
5								

Transfers	Released By	Date/Time	Received By	Date/Time
1	JA Pace	11/21/23 1100		
2				
3			Caleb Tapp	11/22/23

Comments

KS sample location: Receiving

OK

Cooler Temperature on Receipt _____ °C | **Custody Seal** (Y) or N | **Received on Ice** (Y) or N | **Samples Intact** (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

6432 1395 1754

Sample Receipt Checklist

COC Seal Present/Intact:	✓Y N	If Applicable	
COC Signed/Accurate:	✓Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	✓Y N	Pres. Correct/Check:	✓Y N
Correct bottles used:	✓Y N		
Sufficient volume sent:	✓Y N		
RA Screen <0.5 mR/hr:	✓Y N		

CCA8
0.8+0=0.8

Internal Transfer Chain of Custody

Pace

☐ Rush Multiplier_____X
☐ Samples Pre-Logged into eCOC

State Of Origin: MO
Cert. Needed: ☐ Yes ☒ No

Workorder: 60442425 **Workorder Name:** AMEREN LCPB

Owner Received Date: 11/18/2023 **Results Requested By:** 12/6/2023

Report To	Subcontract To
Jamie Church Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 314-838-7223	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: H2SO4	9020B Total Organic Halogens	LAB USE ONLY
								L1681715
1	L-LMW-3S	PS	11/20/2023 13:09	60442425006	Water	1	X	-1
2	L-LMW-FB-1	PS	11/20/2023 12:55	60442425007	Water	1	X	-2

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature]	11.27.23 1900		
2				
3			Christopher S. Gallein	11/28/23 0900

Comments: KS sample location: Receiving

Cooler Temperature on Receipt _____ °C	Custody Seal Y or N	Received on Ice Y or N	Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

DRAFT

Sample Receipt Checklist

COC Seal Present/Intact:	X Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres. Correct/Check:	Y N
Correct bottles used:	Y N	2 RECEIVED	
Sufficient volume sent:	Y N		
RA Screen <0.5 mR/hr:	X Y N		

Internal Transfer Chain of Custody

☐ Rush Multiplier_____X
☒ Samples Pre-Logged into eCOC

State Of Origin: MO
Cert. Needed: ☐ Yes ☒ No

Workorder: 60442425 **Workorder Name:** AMEREN LCPB

Owner Received Date: 11/18/2023 **Results Requested By:** 12/6/2023

Report To	Subcontract To
Jamie Church Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 314-838-7223	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers HNO3						Radium 226	Radium 228										LAB USE ONLY
1	L-LMW-5S	RQS	11/16/2023 15:09	60442425001	Water	2						X	X										001
2	L-LMW-6S	PS	11/15/2023 13:05	60442425002	Water	2						X	X										002
3	L-LMW-DUP-1	PS	11/15/2023 08:00	60442425003	Water	2						X	X										003
4	L-LMW-MS-1	PS	11/16/2023 15:09	60442425004	Water	2						X	X										004
5	L-LMW-MSD-2	PS	11/16/2023 15:09	60442425005	Water	2						X	X										005
6	L-LMW-3S	PS	11/20/2023 13:09	60442425006	Water	2						X	X										006
7	L-LMW-FB-1	PS	11/20/2023 12:55	60442425007	Water	2						X	X										007

Transfers	Released By	Date/Time	Received By	Date/Time
1				12/1/23 1016
2				
3				

Comments

KS sample location: Receiving

Note: Sample 001 is parent sample for MS/MSD samples 004/005.

Cooler Temperature on Receipt ____°C | **Custody Seal** Y or (N) | **Received on Ice** Y or (N) | **Samples Intact** (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

WO# : 30643913

30643913

DC#_Title: ENV-FRM-GBUR-0088 v06_Sample Condition Upon Receipt-Pittsburgh

Effective Date: 09/20/2023

WO#: 30643913

PM: MAR **Due Date: 12/27/23**

CLIENT: PACE_GO_LEKS

Client Name: Pace - KS Pr

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other

Tracking Number: 6432 1395 5554

Initial / Date

Examined By: BS 12/9/23

Labeled By: BS 12/9/23

Temped By: ____

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

Thermometer Used: ____ Type of Ice: Wet Blue ~~None~~

Cooler Temperature: Observed Temp ____ °C Correction Factor: ____ °C Final Temp: ____ °C

Temp should be above freezing to 6°C

pH paper Lot# 1000134 D.P.D. Residual Chlorine Lot # ____

Comments:	Yes	No	NA	
Chain of Custody Present	✓			1.
Chain of Custody Filled Out:	✓			2.
-Were client corrections present on COC		✓		
Chain of Custody Relinquished	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: BS 12/9/23	X	✓		5.
-Includes date/time/ID Matrix: WT				
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used	✓			
Containers Intact:	✓			11.
Orthophosphate field filtered:			✓	12.
Hex Cr Aqueous samples field filtered:			✓	13.
Organic Samples checked for dechlorination			✓	14:
Filtered volume received for dissolved tests:			✓	15:
All containers checked for preservation:	✓			16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix				pH<2
All containers meet method preservation requirements:	✓			Initial when completed: BS Date/Time of Preservation: ____ Lot# of added Preservative: ____
8260C/D: Headspace in VOA Vials (> 6mm)			✓	17.
624.1: Headspace in VOA Vials (0mm)			✓	18.
Trip Blank Present:			✓	Trip blank custody seal present? YES or NO
Rad Samples Screened <.05 mrem/hr.	✓			Initial when completed: JS Date: 12/5/23 Survey Meter SN: 25014380

Comments:

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office.
PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

Memorandum

January 30, 2024

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23007
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	Grant.Morey@Rocksmithgeo.com
RE:	**Data Validation Summary, Labadie Energy Center – LCPB – Data Package 60442425**		

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren LCPB
Project Number: 23007
Reviewer: G. Morey
Validation Date: 1/30/2024

Laboratory: Pace Analytical
SDG #: 60442425
Analytical Method (type and no.): EPA 200.7/200.8 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions);
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names L-LMW-5S, L-LMW-6S, L-LMW-DUP-1, L-LMW-MS-1, L-LMW-MSD-2, L-LMW-3S, L-LMW-FB-1, L-BMW-1S, L-BMW-2S, L-LMW-1S, L-LMW-4S, L-LMW-7S, L-LMW-8S, L-LMW-2S

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			11/15/2023 - 11/20/2023
b) Sampling team indicated?	x			GTM/JSI
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?	■			

Note Deficiencies: Criteria were not met for some method blanks, hold time, laboratory control samples, and matrix spike/matrix spike duplicates. Specific deficiencies explained in detail below.
Revised data packet containing only parameters used for CCR rule.

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

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

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

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

Comments/Notes:

General:

Some TDS samples were analyzed outside of hold time. Results qualified as estimates.

Chloride and/or sulfate were diluted in several samples; no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks:

3481069: TDS (27.0). Associated with samples -002 through -007. Results > RL and 10x blank, no qualification necessary.

Field Blanks:

L-LMW-FB-1 @ L-LMW-3S: boron (9.2J) and manganese (0.60J). Results > RL and 10x blank, no qualification necessary.

Laboratory Control Samples:

3467696: LCS recovery low for fluoride, associated with samples -002 through -007. Results qualified as estimates.

3470527: LCS recovery high for fluoride, associated with samples -001 through -003. All results are non-detects, no qualification necessary.

3471853: LCS recovery high for fluoride, associated with samples -006 and -007. All results are non-detects, no qualification necessary.

3476789: LCS recovery high for fluoride, associated with sample -027. Result is non-detect, no qualification necessary.

Duplicates:

L-LMW-DUP-1 @ L-LMW-6S: Field duplicate RPD exceeds control limit for TDS (13%). Results qualified as estimates.

Lab duplicate max RPD: 10%: alkalinity, TDS; 15%: chloride, fluoride, sulfate

MS/MSD:

3467997/3467998: MS/MSD recoveries high for fluoride. Associated with unrelated sample, no qualification necessary.

3468158: MS recovery low for calcium. Associated with sample -003, result qualified as estimate.

3467697/3467698: MS/MSD recoveries low for fluoride, MS recovery low for sulfate. Associated with unrelated sample, no qualification necessary.

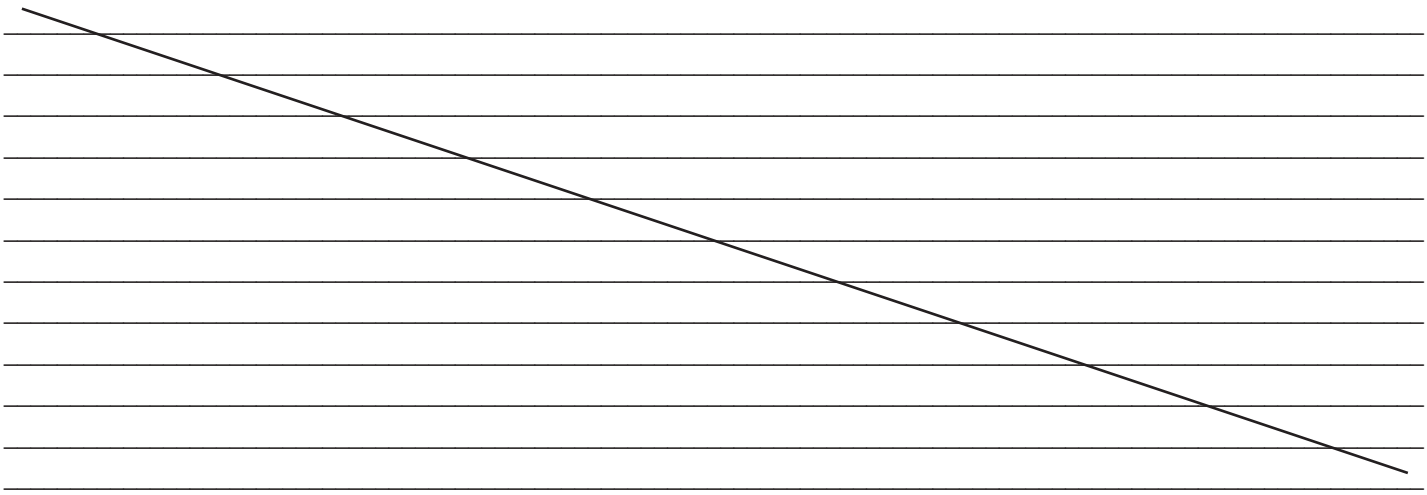
3468421/3468422: MS recovery low for fluoride, MSD recovery and RPD within control limits, no qualification necessary.

3468427/3468428: MS/MSD recoveries low for sulfate. Associated with sample -001. Result qualified as estimate.

3468430/3468431: MS/MSD recoveries and RPD exceeds control limits for fluoride. Associated with unrelated sample, no qualification necessary.

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

3473233/3473234: MS/MSD recoveries low for chloride, associated with unrelated sample, no qualification necessary.



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-LMW-6S	TDS	479	J	Analyzed outside of hold time controls
L-LMW-2S	TDS	533	J	"
L-BMW-1S	Fluoride	0.12	UJ	LCS recovery low
L-BMW-2S	"	0.12	UJ	"
L-LMW-1S	"	0.12	UJ	"
L-LMW-4S	"	0.12	UJ	"
L-LMW-7S	"	0.12	UJ	"
L-LMW-8S	"	0.12	UJ	"
L-LMW-6S	TDS	479	J	Field duplicate RPD exceeds control limits
L-LMW-DUP-1	"	421	J	"
"	Calcium	133,000	J-	MS recovery low
L-LMW-5S	Sulfate	7.9	J-	MS/MSD recoveries low

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 1/30/2024

Appendix B

Alternative Source Demonstration - October 2022 Sampling Event

Technical Memoranum

May 19, 2023

To:	Ameren Missouri 1901 Chouteau Ave, St. Louis, MO 63103	**Project Number:**	23007
From:	Mark Haddock, P.E., R.G., Jeff Ingram, R.G.	**Email:**	Jeff.Ingram@Rocksmithgeo.com
RE :	**LCPB – Alternative Source Demonstration – October 2022 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), Rocksmith Geoengineering, LLC (Rocksmith) has prepared this Technical Memorandum to show that Statistically Significant Increases (SSIs) identified at Ameren Missouri's (Ameren) Labadie Energy Center (LEC) fly ash surface impoundment (LCPB) are the result from an alternative source and are not related to impacts from LCPB. This LCPB 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

The first round of Detection Monitoring was completed during November 2017 at the LEC's LCPB CCR Unit in Franklin 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, and it was determined that the SSIs in the CCR Rule groundwater monitoring wells at the LCPB were not caused by impacts from the LCPB. The ASD report for the November 2017 monitoring results and subsequent ASDs indicated that the SSIs observed in the LCPB wells were caused by the adjacent LCPA surface impoundment. This conclusion was supported by lines of evidence (LOEs) as follows.

- **Geochemical Signatures** – As reflected on the piper diagrams of the November 2017 ASD, LCPA pore-water has a distinctly different signature than the pore-water from the LCPB. CCR groundwater samples in monitoring wells with SSIs plot on the piper diagrams in a location between the LCPA pore-water zone and the background groundwater zone, indicating that well water chemistry is a mixture of unaffected groundwater and groundwater impacted by the LCPA. None of the downgradient monitoring wells plotted in the LCPB pore-water zone, or in the area that is strictly the LCPB mixing zone.
- **USEPA FALCON Analysis** - The USEPA FALCON method compared constituent fingerprints between the downgradient monitoring wells and the background groundwater, LCPB pore-water and LCPA pore-water sources. The results indicate that there are strong correlations between downgradient monitoring wells and

the LCPA pore-water or background groundwater, as compared to LCPB pore-water. These same correlations were found at depth within the alluvial aquifer in the temporary ASD piezometers.

- **Groundwater Flow Directions** - Potentiometric surface mapping demonstrates that groundwater flow directions onsite are variable and can flow in multiple directions, but generally with a northwest or northeast flow direction, depending on the river level in the Missouri River. This supports the conclusion that the unlined LCPA is the source of impacts at the downgradient monitoring because impacted monitoring wells around the LCPB are frequently downgradient from the LCPA.
- **LCPB Construction** - The LCPB was constructed with an engineered liner system with a bottom elevation of approximately 460 FT MSL at its lowest point. The LCPA was built in the early 1970's and has a bottom elevation estimated to be at approximately 410 FT MSL. This, along with key CCR indicators being present in the shallow, middle and deep zones of the alluvial aquifer indicate that impacts present onsite are from the LCPA and not the LCPB.

ASD reports are included in LCPB Annual Groundwater Monitoring and Corrective Action Reports.

3.0 OCTOBER 2022 SAMPLING EVENT

A summary of the October 2022 sampling results is provided in **Table 1**. As discussed in Section 2.0, there are several LOEs presented in the November 2017 ASD that demonstrate that impacts around the LCPB are caused by LCPA and not the LCPB. Although both CCR units are now capped and closed with a geomembrane cover system, the same LOEs are still present at the site, and impacts in the October 2022 sampling event around the LCPB are from the LCPA and not the LCPB. The following summarizes the LOEs using current monitoring data through the October 2022 sampling event.

- **Geochemical Signatures** - **Figure 1** of this Technical Memorandum is a Piper diagram that displays a comparison of October 2022 LCPB CCR Rule groundwater monitoring well data to cation and anion data for the LCPA pore-water, LCPB pore-water, and background groundwater zones. As shown in **Figure 1**, and as expected, if the SSIs were a result of the LCPA, the October 2022 LCPB monitoring results would be expected to plot in the shaded area between the background groundwater quality (yellow section) and the LCPA pore-water (green hexagon) on the Piper diagram. The pattern shown in **Figure 1** indicates that the groundwater impacts from the LCPA are mixing with groundwater along the migration path and, thus, the LCPA is influencing groundwater quality around the LCPB, which is located hydraulically downgradient of the LCPA. Results displayed in **Figure 1** continue to demonstrate that groundwater quality in the monitoring wells around the LCPB are impacted by the LCPA and not the LCPB.
- **USEPA FALCON Analysis** – The USEPA FALCON method compared constituent fingerprints between the downgradient monitoring wells and the background groundwater, LCPB pore-water and LCPA pore-water sources. A Technical Memorandum summarizing the FALCON analysis is provided in **Appendix A**. An updated calculation using data from the October 2022 sampling event was completed, and a summary of the results is provided in Table 5 of **Appendix A**. The results indicate that there is stronger correlation between downgradient monitoring well chemistry and the LCPA pore-water or background groundwater, but weak or no correlation between downgradient well chemistry and LCPB pore-water.
- **Groundwater Flow Direction** - Potentiometric surface mapping from 2018 through 2023 continues to show that while groundwater conditions are variable, net groundwater flow is toward the north/northeast, flowing from the bluffs toward the Missouri River. This supports the conclusion that the unlined LCPA is the source

of impacts at the LCPB downgradient monitoring wells because the impacted monitoring wells around the LCPB are generally located downgradient of the LCPA.

- **LCPB Construction** - The LCPB was constructed with an engineered liner system consisting of a 60-mil High Density Polyethylene (HDPE) geomembrane liner with a minimum bottom elevation of approximately 460 feet above mean sea level (FT MSL). The low permeability HDPE liner system in the LCPB is a barrier to the migration of CCR influenced liquids and provides containment for CCR. The LCPA is unlined and was built in the early 1970s and has a bottom elevation estimated at approximately 410 FT MSL, which is much deeper than the LCPB. In addition to the distinct pore-water fingerprint for LCPA relative to LCPB, there are elevated concentrations of CCR indicators in the intermediate and deep zones of groundwater in the alluvial aquifer surrounding the LCPA, as shown in the LCPA Annual Reports. Around the LCPA, impacts are present in the shallow, intermediate (middle), and deep alluvial zones, and are not isolated to the shallow zone, where LCPB impacts would most readily occur. The impacts to the intermediate and deep alluvial zones are most likely from the LCPA, where the base elevation extends into deeper groundwater zones in the aquifer.

In summary, groundwater chemistry, pore-water chemistry fingerprints, cell construction, and hydrogeological evidence all demonstrate that SSIs reported for the October 2022 Sampling Event for the LCPB CCR Unit were not caused by impacts from the LCPB surface impoundment. The LCPA surface impoundment, located immediately adjacent to the LCPB, is the source of the SSIs for groundwater in the LCPB monitoring well network.

4.0 CERTIFICATION STATEMENT

This *LCPB – Alternative Source Demonstration – October 2022 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 Rocksmith Geoengineering, LLC.

I hereby certify that this *LCPB – Alternative Source Demonstration – October 2022 Sampling Event* located at 226 Labadie Power Plant Road, Labadie, Missouri 63055 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

Rocksmith Geoengineering, LLC

_____

Mark Haddock, P.E., R.G.
Principal Engineer, Senior Partner

Attachments: Table 1 – October 2022 Detection Monitoring Results
Figure 1 – LCPB Piper Diagram for October 2022
Appendix A – FALCON Analysis Calculation Package

Tables

Table 1
October 2022 Detection Monitoring Results
LCPB Surface Impoundment
Labadie Energy Center, Franklin County, MO

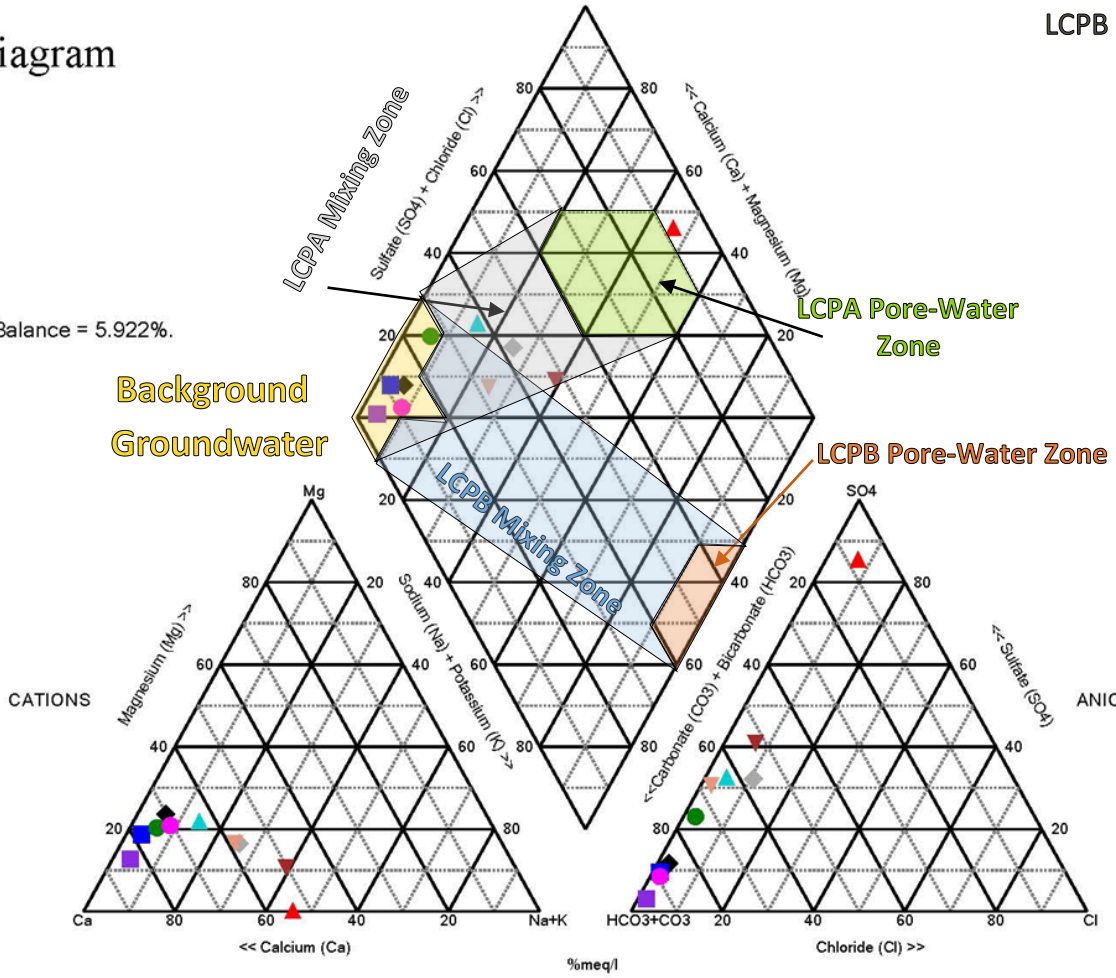
			BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	PREDICTION LIMITS	BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S
October 2022 Detection Monitoring Event												
DATE	NA	NA	10/27/2022	10/27/2022	10/27/2022	10/25/2022	10/25/2022	10/25/2022	10/26/2022	10/28/2022	10/28/2022	10/27/2022
pH	SU	6.239-7.394	6.68	6.95	6.97	9.52	7.10	6.80	6.70	6.81	6.57	7.10
BORON, TOTAL	µg/L	147	91.2 J	45.3 J	2,240	3,250	4,340	5,490	55.6 J	1,150	7,050	2,760
CALCIUM, TOTAL	µg/L	219,000	185,000	146,000	108,000	75,900	112,000	139,000	170,000	118,000	185,000	82,700
CHLORIDE, TOTAL	mg/L	7.654	5.9	1.4	4.9	15.8	20.8	39.5	1.9	3.1 J	17.5	3.2 J
FLUORIDE, TOTAL	mg/L	0.2606	ND	ND	ND	ND	0.33 J	0.13 J	ND	0.26	ND	0.54
SULFATE, TOTAL	mg/L	75.37	66.5	34.4	74.3	299	198	174	12.3	29.0	202	93.1
TOTAL DISSOLVED SOLIDS	mg/L	792	710	496	430	556	700	756	501	450	829	404 J

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
5. Prediction Limits calculated using Sanitas Software.
6. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. There were no new initial exceedances for the October 2022 event; therefore, no Verification Sampling was necessary.

Prepared By: JSI
Checked By: JSI
Reviewed By: MNH

Figures

Piper Diagram



Cation-Anion Balance = 5.922%.

LCPB CCR Rule Monitoring Wells

- L-BMW-1S* 2022-10-27
- L-BMW-2S* 2022-10-27
- L-LMW-1S 2022-10-27
- L-LMW-2S 2022-10-25
- L-LMW-3S 2022-10-25
- L-LMW-4S 2022-10-25
- L-LMW-5S 2022-10-26
- L-LMW-6S 2022-10-28
- L-LMW-7S 2022-10-28
- L-LMW-8S 2022-10-27

Notes
1) Piper diagram generated using Sanitas Software.
2) %mEq/l – milliequivalents per liter

CLIENT/PROJECT **AMEREN MISSOURI** **LABADIE ENERGY CENTER**				TITLE **LCPB Piper Diagram for October 2022**	
DRAWN JSI	CHECKED JSI	REVIEWED MNH	DATE 2023-03-15	Rev No. NA	JOB NO. 23007	FIGURE **1**

Appendix A
FALCON Analysis Calculation Package

Technical Memorandum

May 19, 2023

To:	Ameren Missouri 1901 Chouteau Ave, St. Louis, MO 63103	**Proposal Number:**	23007
From:	Mark Haddock, P.E., R.G., Jeff Ingram, R.G.	**Email:**	Jeff.Ingram@RocksmithGeo.com
RE:	**Appendix A – LCPB FALCON Analysis Calculation Package**		

1.0 OBJECTIVE

The objective of this Technical Memorandum calculation package is to determine if there is a correlation between the ion ratio fingerprints in the LCPA pore-water, LCPB pore-water or background groundwater with the compliance monitoring well samples in the alluvial aquifer at the Labadie Energy Center (LEC).

2.0 FINGERPRINT ANALYSIS OF LEACHATE CONTAMINANTS (FALCON) METHOD

The Fingerprint Analysis of Leachate Contaminants (FALCON) method was developed in 2004 by the United States Environmental Protection Agency (USEPA) as a tool to identify the source of impacts within groundwater. The FALCON method compiles ion ratios for multiple constituents in order to develop a distinctive chemical fingerprint for each possible contaminant source and un-impacted background groundwater. These fingerprints were correlated to well sample data downgradient of the sources and are used to characterize the source of the contaminant plume. For this calculation, background groundwater quality is derived from samples collected in background wells located approximately 2 to 2.5 miles west of the LCPB. Source data are from pore-water collected from piezometers within the LCPA and LCPB. Fingerprints from these three sources (background groundwater, LCPA pore-water and LCPB pore-water) were compared to data from alluvial aquifer monitoring well sampling locations at the LEC. Data from the LCPA and LCPB pore-water are from the November 2017 ASD for the LCPB, which is available in the 2019 Annual Report for the LCPB. Data from the background and compliance monitoring wells are from the October 2022 sampling event.

3.0 SELECTION OF CONSTITUENTS TO USE

The first step in completing the FALCON analysis was to select a subset of constituents that are representative of the potential source areas. When selecting these constituents, it is important to include constituents that are mobile in the hydrogeological environment and that can uniquely characterize each water type. Constituents selected included major cation and anion constituents that represent groundwater chemistry and selected key indicators of CCR impacts. Values of the three different sources were compared to see which constituents fit the criteria. A summary table of the values used for the three sources is provided in **Table 1**. The following constituents were selected to complete the FALCON analysis:

- Alkalinity
- Total Boron
- Total Calcium
- Total Chloride
- Total Fluoride
- Total Iron
- Total Magnesium
- Total Manganese
- Total Potassium
- Total Sodium
- Total Sulfate

4.0 DATA TABULATION AND NORMALIZATION

Once the constituents were selected, the data were tabulated, normalized and a graphical presentation of the fingerprints was produced. The data used, along with the normalization percentages, are provided in **Table 1** for the three different sources (background groundwater, LCPA pore-water, and LCPB pore-water) as well as for each monitoring well evaluated. Correlations were then completed between the different sources to determine each source's reproducibility. Tables displaying the FALCON correlations are provided below in **Tables 2-4**.

Table 2 – Background Groundwater Correlations

LCPB Pore-water Correlations			
Well ID	*L-LCPB-1*	*L-LCPB-2*	*L-LCPB-3*
L-LCPB-1			
L-LCPB-2	99.6%		
L-LCPB-3	98.9%	99.5%	
Average Fingerprint Reproducibility			99.4%

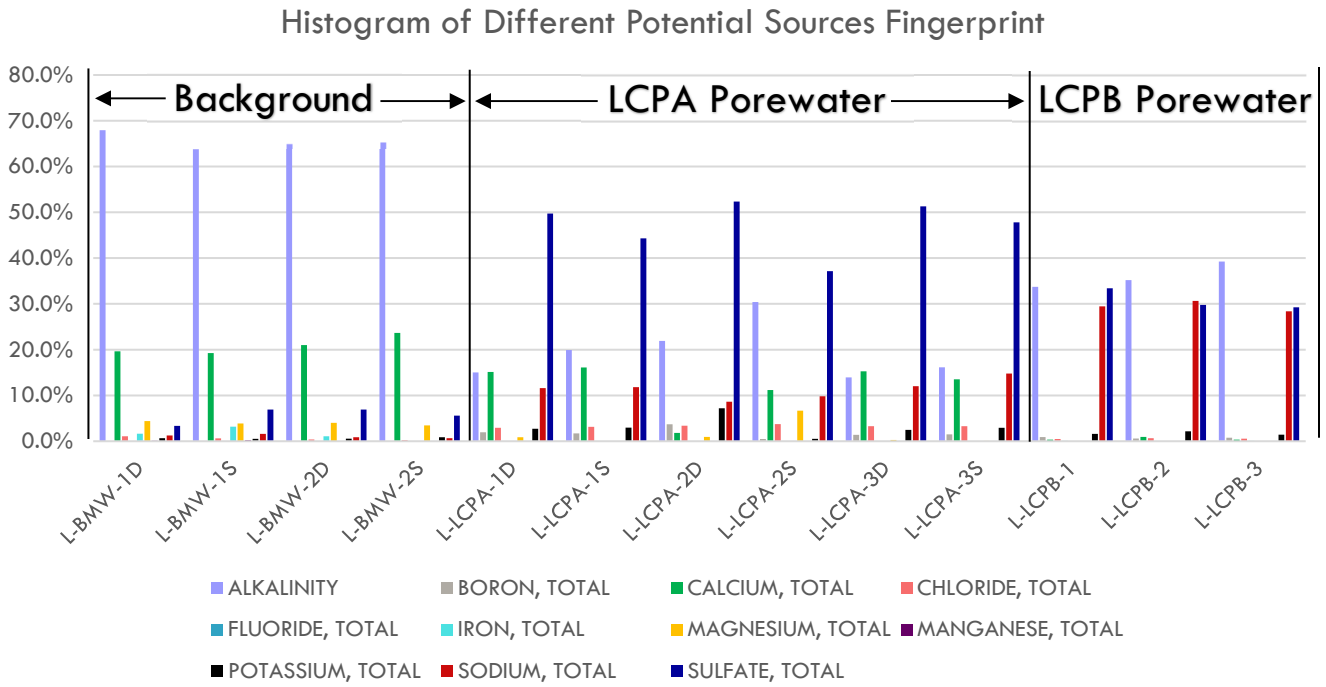
Table 3- LCPB Pore-water Correlations

LCPB Pore-water Correlations			
	L-LCPB-1	*L-LCPB-2*	*L-LCPB-3*
L-LCPB-1			
L-LCPB-2	99.6%		
L-LCPB-3	98.9%	99.5%	
Average Fingerprint Reproducibility			99.4%

Table 4 – LCPA Pore-water Correlations

Well ID	*L-LCPA-1D*	*L-LCPA-1S*	*L-LCPA-2D*	*L-LCPA-2S*	*L-LCPA-3D*	*L-LCPA-3S*
L-LCPA-1D						
L-LCPA-1S	98.9%					
L-LCPA-2D	94.5%	93.8%				
L-LCPA-2S	88.9%	93.3%	90.0%			
L-LCPA-3D	99.9%	98.5%	94.1%	87.6%		
L-LCPA-3S	99.6%	99.0%	94.8%	89.8%	99.5%	
Average Fingerprint Reproducibility						94.8%
Average Fingerprint Reproducibility with LCPA-1S, LCPA-1D, LCPA-2D, LCPA-3S and LCPA-3D						97.2%

Additionally, **Figure 1** below displays a histogram of the different source water normalizations.



As described in the ASD report for the November 2017 monitoring results (provided in the 2018 Annual Report for the LCPB), samples collected within the LCPA unit displayed less correlation due to the spatial variation of sample locations and differing CCR materials present in sample intervals. The LCPA has been in operation since the 1970s and there have been many changes to CCR the LCPA received during this time. These include changes in types of coal used onsite, types of CCR placed in the facility (pre-LCPB construction vs. post-LCPB construction), and types of CCR placed within the unit. While not as evident using the constituents available for this evaluation, no Appendix IV constituents were tested because LCPB is under detection monitoring. When compared with the 2018 evaluation, LCPA-2S still appears to have a weaker correlation (<90% in this case) and is, therefore, evaluated separately. Separating the LCPA into two potential sources (one for LCPA-1S, -1D, -2D, -3S, -3D and one for LCPA-2S) more accurately reflects the conditions within the LCPA due to its spatial variation of constituent concentrations.

5.0 CORRELATING DOWNGRADIENT GROUNDWATER SAMPLES WITH SOURCES

A correlation between the average groundwater concentration and the different source waters was completed to demonstrate which source better correlates with each alluvial aquifer groundwater sample. Results from this correlation are provided in **Table 5** and the values used for this correlation are provided in **Table 1**. The results demonstrate that groundwater in the alluvial aquifer correlates better with the LCPA pore-water or background groundwater than it does with the LCPB pore-water. In no case did a downgradient groundwater sample correlate better with the LCPB pore-water than with the LCPA pore-water or background groundwater.

Table 5 – Summary of October 2022 USEPA FALCON Evaluation

Piezometer or Well ID	Percent Correlation				Highest (Best) Correlation
	Background Groundwater	LCPB Average	LCPA Average (LCPA-1S/D, LCPA-2D & LCPA-3S/D)	LCPA-2S	
L-BMW-1D	100%	56%	24%	59%	Background
L-BMW-1S	100%	59%	29%	63%	Background
L-BMW-2D	100%	58%	29%	63%	Background
L-BMW-2S	100%	56%	28%	61%	Background
L-AM-1D	33%	78%	99%	93%	LCPA-Average
L-AM-1S	99%	57%	20%	56%	Background
L-AMW-8	33%	80%	99%	93%	LCPA-Average
L-LMW-1S	99%	64%	41%	72%	Background
L-LMW-2S	6%	61%	97%	80%	LCPA-Average
L-LMW-3S	86%	86%	70%	91%	LCPA-2S
L-LMW-4S	94%	77%	58%	84%	Background
L-LMW-5S	100%	53%	23%	57%	Background
L-LMW-6S	100%	58%	27%	61%	Background
L-LMW-7S	95%	72%	56%	83%	Background
L-LMW-8S	96%	76%	52%	80%	Background
L-MW-24	100%	57%	26%	61%	Background
L-MW-26	100%	57%	27%	61%	Background
L-MW-33(D)	19%	68%	99%	88%	LCPA-Average
L-MW-34(D)	59%	83%	94%	99%	LCPA-2S
L-MW-35(D)	55%	81%	95%	99%	LCPA-2S
L-S-1	100%	54%	23%	57%	Background
L-TMW-1	100%	60%	32%	65%	Background
L-TMW-2	96%	68%	52%	80%	Background
L-TMW-3	100%	58%	28%	62%	Background
L-TP-1D	100%	56%	23%	58%	Background
L-TP-2D	87%	83%	70%	91%	LCPA-2S
L-TP-2M	85%	84%	72%	93%	LCPA-2S
L-TP-3D	15%	68%	99%	86%	LCPA-Average
L-TP-3M	82%	84%	77%	95%	LCPA-2S
L-TP-4D	91%	75%	65%	89%	Background
L-UMW-1D	100%	57%	22%	58%	Background
L-UMW-2D	96%	75%	51%	79%	Background
L-UMW-3D	34%	68%	99%	92%	LCPA-Average
L-UMW-4D	12%	70%	98%	84%	LCPA-Average
L-UMW-5D	77%	88%	81%	96%	LCPA-2S
L-UMW-6D	7%	62%	98%	81%	LCPA-Average
L-UMW-7D	100%	61%	32%	65%	Background
L-UMW-8D	98%	71%	32%	65%	Background
L-UMW-9D	99%	53%	18%	54%	Background

Notes
1) Values display percent correlation between each sampling point and the LPCA, LCPB or background fingerprints.
2) The higher values are shaded darker and indicate better correlation.
3) More information on the calculation of these numbers is provided in Table 1.

Tables

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-BMW-1D	L-BMW-1S	L-BMW-2D	L-BMW-2S	L-AM-1D	L-AM-1S	L-AMW-8
ALKALINITY	mg/L	457	625	428	404	147	672	102
BORON, TOTAL	mg/L	0.0791	0.0912	0.0679	0.0453	8.07	0.316	5.77
CALCIUM, TOTAL	mg/L	132	185	138	146	97.4	166	61.4
CHLORIDE, TOTAL	mg/L	7.30	5.90	2.40	1.40	36.9	35.9	22.2
FLUORIDE, TOTAL	mg/L	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
IRON, TOTAL	mg/L	10.9	30.5	6.99	0.0250	4.83	14.2	2.39
MAGNESIUM, TOTAL	mg/L	29.5	37.2	26.4	21.3	11.9	33.7	10.2
MANGANESE, TOTAL	mg/L	0.626	2.32	0.275	0.00250	0.248	2.78	0.294
POTASSIUM, TOTAL	mg/L	4.38	4.94	3.69	5.40	8.95	6.18	5.35
SODIUM, TOTAL	mg/L	8.44	15.5	5.77	4.13	104	50.3	81.4
SULFATE, TOTAL	mg/L	22.5	66.5	45.5	34.4	353	5.10	236
Sum		672.8	973.0	657.2	616.8	772.4	986.5	527.1

Analyte	L-BMW-1D	L-BMW-1S	L-BMW-2D	L-BMW-2S	L-AM-1D	L-AM-1S	L-AMW-8
ALKALINITY	68%	64%	65%	66%	19%	68%	19%
BORON, TOTAL	0.012%	0.0094%	0.01%	0.0073%	1%	0.032%	1.1%
CALCIUM, TOTAL	20%	19%	21%	24%	13%	17%	12%
CHLORIDE, TOTAL	1.1%	0.61%	0.37%	0.23%	4.8%	3.6%	4.2%
FLUORIDE, TOTAL	0.0089%	0.0062%	0.0091%	0.0097%	0.0078%	0.0061%	0.011%
IRON, TOTAL	1.6%	3.1%	1.1%	0.0041%	0.63%	1.4%	0.45%
MAGNESIUM, TOTAL	4.4%	3.8%	4%	3.5%	1.5%	3.4%	1.9%
MANGANESE, TOTAL	0.093%	0.24%	0.042%	0.00041%	0.032%	0.28%	0.056%
POTASSIUM, TOTAL	0.65%	0.51%	0.56%	0.88%	1.2%	0.63%	1%
SODIUM, TOTAL	1.3%	1.6%	0.88%	0.67%	13%	5.1%	15%
SULFATE, TOTAL	3.3%	6.8%	6.9%	5.6%	46%	0.52%	45%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from October 2022 samples collected for the CCR Rule.
2) Unit abbreviations - µg/L - micrograms per liter, mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Prepared By: JSI
Checked By: JSI
Reviewed By: MNH

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-LMW-1S	L-LMW-2S	L-LMW-3S	L-LMW-4S	L-LMW-5S	L-LMW-6S	L-LMW-7S
ALKALINITY	mg/L	311	35.1	326	398	466	387	493
BORON, TOTAL	mg/L	2.24	3.25	4.34	5.49	0.0556	1.15	7.05
CALCIUM, TOTAL	mg/L	108	75.9	112	139	170	118	185
CHLORIDE, TOTAL	mg/L	4.90	15.8	20.8	39.5	1.90	3.10	17.5
FLUORIDE, TOTAL	mg/L	0.0600	0.0600	0.330	0.130	0.060	0.260	0.0600
IRON, TOTAL	mg/L	1.27	0.0174	11.5	6.37	0.0922	5.37	2.43
MAGNESIUM, TOTAL	mg/L	18.3	0.103	14.2	24.0	15.9	21.0	38.8
MANGANESE, TOTAL	mg/L	0.647	0.0025	1.14	1.38	0.0154	1.52	1.84
POTASSIUM, TOTAL	mg/L	3.60	9.69	7.06	6.15	3.67	5.22	7.90
SODIUM, TOTAL	mg/L	8.04	69.0	95.1	67.7	7.32	13.2	44.2
SULFATE, TOTAL	mg/L	74.3	299	198	174	12.3	29.0	202
Sum		532.4	507.9	790.5	861.7	677.3	584.8	999.8

Analyte	L-LMW-1S	L-LMW-2S	L-LMW-3S	L-LMW-4S	L-LMW-5S	L-LMW-6S	L-LMW-7S
ALKALINITY	58%	6.9%	41%	46%	69%	66%	49%
BORON, TOTAL	0.42%	0.64%	0.55%	0.64%	0.0082%	0.2%	0.71%
CALCIUM, TOTAL	20%	15%	14%	16%	25%	20%	19%
CHLORIDE, TOTAL	0.92%	3.1%	2.6%	4.6%	0.28%	0.53%	1.8%
FLUORIDE, TOTAL	0.011%	0.012%	0.042%	0.015%	0.0089%	0.044%	0.006%
IRON, TOTAL	0.24%	0.0034%	1.5%	0.74%	0.014%	0.92%	0.24%
MAGNESIUM, TOTAL	3.4%	0.02%	1.8%	2.8%	2.3%	3.6%	3.9%
MANGANESE, TOTAL	0.12%	0.00049%	0.14%	0.16%	0.0023%	0.26%	0.18%
POTASSIUM, TOTAL	0.68%	1.9%	0.89%	0.71%	0.54%	0.89%	0.79%
SODIUM, TOTAL	1.5%	14%	12%	7.9%	1.1%	2.3%	4.4%
SULFATE, TOTAL	14%	59%	25%	20%	1.8%	5%	20%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from October 2022 samples collected for the CCR Rule.
2) Unit abbreviations - µg/L - micrograms per liter, mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

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Reviewed By: MNH

Table 1
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LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-LMW-8S	L-MW-24	L-MW-26	L-MW-33(D)	L-MW-34(D)	L-MW-35(D)	L-S-1
ALKALINITY	mg/L	266	417	410	109	200	274	464
BORON, TOTAL	mg/L	2.76	0.0711	0.0683	9.22	9.58	7.71	0.0751
CALCIUM, TOTAL	mg/L	82.7	123	128	108	101	119	144
CHLORIDE, TOTAL	mg/L	3.20	5.70	10.3	21.1	19.5	16.7	1.80
FLUORIDE, TOTAL	mg/L	0.540	0.0600	0.0600	0.0600	0.0600	0.180	0.0600
IRON, TOTAL	mg/L	2.31	0.0141	0.00750	5.24	5.67	5.36	0.0629
MAGNESIUM, TOTAL	mg/L	14.0	24.4	23.2	22.0	23.7	26.8	20.4
MANGANESE, TOTAL	mg/L	0.389	0.00250	0.0689	0.275	0.256	0.393	0.527
POTASSIUM, TOTAL	mg/L	4.45	5.09	4.18	7.39	6.88	5.17	28.2
SODIUM, TOTAL	mg/L	38.2	7.10	5.27	99.4	71.7	75.9	2.92
SULFATE, TOTAL	mg/L	93.1	29.6	31.3	425	267	399	17.5
Sum		507.6	612.0	612.5	806.7	705.3	930.2	679.5

Analyte	L-LMW-8S	L-MW-24	L-MW-26	L-MW-33(D)	L-MW-34(D)	L-MW-35(D)	L-S-1
ALKALINITY	52%	68%	67%	14%	28%	29%	68%
BORON, TOTAL	0.54%	0.012%	0.011%	1.1%	1.4%	0.83%	0.011%
CALCIUM, TOTAL	16%	20%	21%	13%	14%	13%	21%
CHLORIDE, TOTAL	0.63%	0.93%	1.7%	2.6%	2.8%	1.8%	0.26%
FLUORIDE, TOTAL	0.11%	0.0098%	0.0098%	0.0074%	0.0085%	0.019%	0.0088%
IRON, TOTAL	0.46%	0.0023%	0.0012%	0.65%	0.8%	0.58%	0.0093%
MAGNESIUM, TOTAL	2.8%	4%	3.8%	2.7%	3.4%	2.9%	3%
MANGANESE, TOTAL	0.077%	0.00041%	0.011%	0.034%	0.036%	0.042%	0.078%
POTASSIUM, TOTAL	0.88%	0.83%	0.68%	0.92%	0.98%	0.56%	4.1%
SODIUM, TOTAL	7.5%	1.2%	0.86%	12%	10%	8.2%	0.43%
SULFATE, TOTAL	18%	4.8%	5.1%	53%	38%	43%	2.6%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from October 2022 samples collected for the CCR Rule.
2) Unit abbreviations - µg/L - micrograms per liter, mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

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Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-TMW-1	L-TMW-2	L-TMW-3	L-TP-1D	L-TP-2D	L-TP-2M	L-TP-3D
ALKALINITY	mg/L	539	651	433	494	254	254	117
BORON, TOTAL	mg/L	0.115	0.115	0.0983	0.0606	1.62	1.35	9.47
CALCIUM, TOTAL	mg/L	159	246	134	138	92.5	70.9	90.5
CHLORIDE, TOTAL	mg/L	3.20	18.2	3.10	3.50	25.0	25.0	23.8
FLUORIDE, TOTAL	mg/L	0.0600	0.0600	0.0600	0.0600	0.14	0.15	0.0600
IRON, TOTAL	mg/L	0.161	0.164	1.23	8.45	3.43	2.12	4.22
MAGNESIUM, TOTAL	mg/L	44.7	67.3	29.7	34.3	16.1	10.3	19.8
MANGANESE, TOTAL	mg/L	0.451	2.70	0.795	0.234	0.302	0.299	0.158
POTASSIUM, TOTAL	mg/L	5.83	7.70	5.73	4.24	5.52	5.04	6.69
SODIUM, TOTAL	mg/L	11.3	18.0	6.70	11.5	58.2	48.7	119
SULFATE, TOTAL	mg/L	70.8	247	39.5	17.9	154	163	527
Sum		834.6	1258.2	653.9	712.2	610.8	580.9	917.7

Analyte	L-TMW-1	L-TMW-2	L-TMW-3	L-TP-1D	L-TP-2D	L-TP-2M	L-TP-3D
ALKALINITY	65%	52%	66%	69%	42%	44%	13%
BORON, TOTAL	0.014%	0.0091%	0.015%	0.0085%	0.27%	0.23%	1%
CALCIUM, TOTAL	19%	20%	20%	19%	15%	12%	9.9%
CHLORIDE, TOTAL	0.38%	1.4%	0.47%	0.49%	4.1%	4.3%	2.6%
FLUORIDE, TOTAL	0.0072%	0.0048%	0.0092%	0.0084%	0.023%	0.026%	0.0065%
IRON, TOTAL	0.019%	0.013%	0.19%	1.2%	0.56%	0.36%	0.46%
MAGNESIUM, TOTAL	5.4%	5.3%	4.5%	4.8%	2.6%	1.8%	2.2%
MANGANESE, TOTAL	0.054%	0.21%	0.12%	0.033%	0.049%	0.051%	0.017%
POTASSIUM, TOTAL	0.7%	0.61%	0.88%	0.6%	0.9%	0.87%	0.73%
SODIUM, TOTAL	1.4%	1.4%	1%	1.6%	9.5%	8.4%	13%
SULFATE, TOTAL	8.5%	20%	6%	2.5%	25%	28%	57%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from October 2022 samples collected for the CCR Rule.
2) Unit abbreviations - µg/L - micrograms per liter, mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.
4) The alkalinuty value represented for TP-1D is an average of available alkalinity data at the well. The October 2022 result was low outlier which does not accurately represent observed concentrations for TP-1D.

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Reviewed By: MNH

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-TP-3M	L-TP-4D	L-UMW-1D	L-UMW-2D	L-UMW-3D	L-UMW-4D	L-UMW-5D
ALKALINITY	mg/L	262	309	551	381	158	59.7	333
BORON, TOTAL	mg/L	5.05	6.86	0.556	0.941	10	4.96	6.68
CALCIUM, TOTAL	mg/L	103	120	141	121	152	58.6	74.8
CHLORIDE, TOTAL	mg/L	19.2	15.2	10.6	28.0	17.9	21.2	22.1
FLUORIDE, TOTAL	mg/L	0.0600	0.15	0.0600	0.0600	0.0600	0.0600	0.0600
IRON, TOTAL	mg/L	8.20	5.27	18.2	3.86	1.28	0.259	0.0181
MAGNESIUM, TOTAL	mg/L	21.9	30.7	34.6	24.7	15.4	6.34	0.0911
MANGANESE, TOTAL	mg/L	1.24	0.318	0.402	0.436	0.377	0.278	0.0106
POTASSIUM, TOTAL	mg/L	5.02	4.57	6.36	7.7	10.6	8.27	12.3
SODIUM, TOTAL	mg/L	59.3	28.3	23.1	62.1	63.2	93.2	78.7
SULFATE, TOTAL	mg/L	197	171	20.0	128	413	289	272
Sum		682.0	691.4	805.9	757.8	841.8	541.9	799.8

Analyte	L-TP-3M	L-TP-4D	L-UMW-1D	L-UMW-2D	L-UMW-3D	L-UMW-4D	L-UMW-5D
ALKALINITY	38%	45%	68%	50%	19%	11%	42%
BORON, TOTAL	0.74%	0.99%	0.069%	0.12%	1.2%	0.92%	0.84%
CALCIUM, TOTAL	15%	17%	17%	16%	18%	11%	9.4%
CHLORIDE, TOTAL	2.8%	2.2%	1.3%	3.7%	2.1%	3.9%	2.8%
FLUORIDE, TOTAL	0.0088%	0.022%	0.0074%	0.0079%	0.0071%	0.011%	0.0075%
IRON, TOTAL	1.2%	0.76%	2.3%	0.51%	0.15%	0.048%	0.0023%
MAGNESIUM, TOTAL	3.2%	4.4%	4.3%	3.3%	1.8%	1.2%	0.011%
MANGANESE, TOTAL	0.18%	0.046%	0.05%	0.058%	0.045%	0.051%	0.0013%
POTASSIUM, TOTAL	0.74%	0.66%	0.79%	1%	1.3%	1.5%	1.5%
SODIUM, TOTAL	8.7%	4.1%	2.9%	8.2%	7.5%	17%	9.8%
SULFATE, TOTAL	29%	25%	2.5%	17%	49%	53%	34%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from October 2022 samples collected for the CCR Rule.
2) Unit abbreviations - µg/L - micrograms per liter, mg/L - milligrams per liter.
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Labadie Energy Center, Franklin County, MO

Analyte	Units	L-UMW-6D	L-UMW-7D	L-UMW-8D	L-UMW-9D	L-LCPA-1D	L-LCPA-1S	L-LCPA-2D
ALKALINITY	mg/L	66.6	443	133	405	77.6	120	128
BORON, TOTAL	mg/L	10.5	1.32	0.654	0.0864	10.0	10.3	21.7
CALCIUM, TOTAL	mg/L	123	140	26.4	114	78.2	97.1	10.6
CHLORIDE, TOTAL	mg/L	21.8	6.90	3.40	25.5	15.2	18.9	19.8
FLUORIDE, TOTAL	mg/L	0.0600	0.0600	0.420	0.220	0.200	0.088	0.140
IRON, TOTAL	mg/L	0.168	12.7	4.89	24.2	0.178	0.138	0.0869
MAGNESIUM, TOTAL	mg/L	2.02	21.0	6.48	30.3	4.47	0.184	5.43
MANGANESE, TOTAL	mg/L	0.152	1.49	0.170	0.380	0.00410	0.00320	0.00250
POTASSIUM, TOTAL	mg/L	22.0	4.73	2.57	4.16	14.0	17.8	42.1
SODIUM, TOTAL	mg/L	127	23.2	24.8	13.7	60.0	71.1	50.5
SULFATE, TOTAL	mg/L	511	58.9	17.2	0.275	257	267	306
Sum		884.3	713.3	220.0	617.8	516.9	602.6	584.4

Analyte	L-UMW-6D	L-UMW-7D	L-UMW-8D	L-UMW-9D	L-LCPA-1D	L-LCPA-1S	L-LCPA-2D
ALKALINITY	7.5%	62%	60%	66%	15%	20%	22%
BORON, TOTAL	1.2%	0.19%	0.3%	0.014%	1.9%	1.7%	3.7%
CALCIUM, TOTAL	14%	20%	12%	18%	15%	16%	1.8%
CHLORIDE, TOTAL	2.5%	0.97%	1.5%	4.1%	2.9%	3.1%	3.4%
FLUORIDE, TOTAL	0.0068%	0.0084%	0.19%	0.036%	0.039%	0.015%	0.024%
IRON, TOTAL	0.019%	1.8%	2.2%	3.9%	0.034%	0.023%	0.015%
MAGNESIUM, TOTAL	0.23%	2.9%	2.9%	4.9%	0.86%	0.031%	0.93%
MANGANESE, TOTAL	0.017%	0.21%	0.077%	0.062%	0.00079%	0.00053%	0.00043%
POTASSIUM, TOTAL	2.5%	0.66%	1.2%	0.67%	2.7%	3%	7.2%
SODIUM, TOTAL	14%	3.3%	11%	2.2%	12%	12%	8.6%
SULFATE, TOTAL	58%	8.3%	7.8%	0.045%	50%	44%	52%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from October 2022 samples collected for the CCR Rule.
2) Unit abbreviations - µg/L - micrograms per liter, mg/L - milligrams per liter.
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Checked By: JSI
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Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-LCPA-2S	L-LCPA-3D	L-LCPA-3S	L-LCPB-1	L-LCPB-2	L-LCPB-3
ALKALINITY	mg/L	208	80.2	91.8	1070	861	1340
BORON, TOTAL	mg/L	3.36	8.10	8.44	28.2	14.8	25.7
CALCIUM, TOTAL	mg/L	76.5	87.7	76.9	11.4	22.6	11.4
CHLORIDE, TOTAL	mg/L	25.5	18.9	18.6	15.6	16.2	18.4
FLUORIDE, TOTAL	mg/L	0.170	0.160	0.160	2.40	1.00	1.90
IRON, TOTAL	mg/L	0.0279	0.122	0.112	0.0273	0.129	0.384
MAGNESIUM, TOTAL	mg/L	45.5	1.54	0.445	0.0844	0.0874	0.386
MANGANESE, TOTAL	mg/L	0.0392	0.00230	0.00250	0.00250	0.00250	0.00230
POTASSIUM, TOTAL	mg/L	3.54	14.2	16.6	51.0	52.6	48.2
SODIUM, TOTAL	mg/L	67.2	69.0	84.0	935	750	969
SULFATE, TOTAL	mg/L	254	295	272	1060	728	999
Sum		683.8	574.9	569.1	3173.7	2446.4	3414.4

Analyte	L-LCPA-2S	L-LCPA-3D	L-LCPA-3S	L-LCPB-1	L-LCPB-2	L-LCPB-3
ALKALINITY	30%	14%	16%	34%	35%	39%
BORON, TOTAL	0.49%	1.4%	1.5%	0.89%	0.6%	0.75%
CALCIUM, TOTAL	11%	15%	14%	0.36%	0.92%	0.33%
CHLORIDE, TOTAL	3.7%	3.3%	3.3%	0.49%	0.66%	0.54%
FLUORIDE, TOTAL	0.025%	0.028%	0.028%	0.076%	0.041%	0.056%
IRON, TOTAL	0.0041%	0.021%	0.02%	0.00086%	0.0053%	0.011%
MAGNESIUM, TOTAL	6.7%	0.27%	0.078%	0.0027%	0.0036%	0.011%
MANGANESE, TOTAL	0.0057%	0.0004%	0.00044%	0.000079%	0.0001%	0.000067%
POTASSIUM, TOTAL	0.52%	2.5%	2.9%	1.6%	2.2%	1.4%
SODIUM, TOTAL	9.8%	12%	15%	29%	31%	28%
SULFATE, TOTAL	37%	51%	48%	33%	30%	29%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from October 2022 samples collected for the CCR Rule.
2) Unit abbreviations - µg/L - micrograms per liter, mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Prepared By: JSI
Checked By: JSI
Reviewed By: MNH

Appendix C

Alternative Source Demonstration - May 2023 Sampling Event

Technical Memoranum

December 26, 2023

To:	Ameren Missouri 1901 Chouteau Ave, St. Louis, MO 63103	**Project Number:**	23007
From:	Mark Haddock, P.E., R.G., Jeff Ingram, R.G.	**Email:**	jeff.ingram@rocksmithgeo.com
RE :	**LCPB – Alternative Source Demonstration – May 2023 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), Rocksmith Geoengineering, LLC (Rocksmith) has prepared this Technical Memorandum to show that Statistically Significant Increases (SSIs) identified at Ameren Missouri's (Ameren) Labadie Energy Center (LEC) fly ash surface impoundment (LCPB) are the result from an alternative source and are not related to impacts from LCPB. This LCPB 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

The first Detection Monitoring sampling event at the LEC's LCPB CCR Unit in Franklin County, Missouri was completed in November 2017. 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, and it was determined that the SSIs in the CCR Rule groundwater monitoring wells at the LCPB were not caused by impacts from the LCPB. The ASD report for the November 2017 monitoring results and subsequent ASDs indicated that the SSIs observed in the LCPB wells were caused by the adjacent LCPA surface impoundment. This conclusion was supported by lines of evidence (LOEs) as follows.

- Geochemical Signatures
- USEPA FALCON Analysis
- Groundwater Flow Directions
- Construction of the LCPB

Previous ASD reports may be found in the LCPB Annual Groundwater Monitoring and Corrective Action Reports available on Ameren's Publicly available website (https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports).

3.0 MAY 2023 SAMPLING EVENT

A summary of the May 2023 sampling results is provided in **Table 1**. As discussed in **Section 2.0**, there are several LOEs presented in the previous ASDs that demonstrate that impacts around the LCPB are caused by LCPA and not the LCPB. Although both CCR units are now capped and closed with a geomembrane cover system, the same LOEs are still present at the site, and impacts in the May 2023 sampling event around the LCPB are from the LCPA and not the LCPB. The following summarizes the LOEs using current monitoring data through the May 2023 sampling event.

- **Geochemical Signatures** - As reflected on the piper diagram provided in **Figure 1**, LCPA pore-water has a distinctly different signature than the pore-water from the LCPB. Groundwater samples in monitoring wells with SSIs plot on the piper diagrams in a location between the LCPA pore-water zone and the background groundwater zone, indicating that well water chemistry is a mixture of unaffected groundwater and groundwater impacted by the LCPA.
- **USEPA FALCON Analysis** – The USEPA FALCON method compared constituent fingerprints from the downgradient monitoring wells with those of background groundwater, LCPB pore-water, and LCPA pore-water. A Technical Memorandum summarizing the calculations and results is provided in **Appendix A**. An updated calculation using data from the May 2023 sampling event was completed and a summary of the results is provided in Table 5 of **Appendix A**. The results indicate that there is strong correlation between the downgradient monitoring wells and both the LCPA pore-water and background groundwater, while there is low correlation between downgradient monitoring well data and LCPB pore-water. These same correlations were found at depth within the alluvial aquifer.
- **Groundwater Flow Direction** - Potentiometric surface mapping from 2018 through 2023 continue to show that while groundwater conditions are variable, net groundwater flow is toward the north or northeast, flowing from the bluffs toward the Missouri River. This supports the conclusion that the unlined LCPA is the source of impacts at the LCPB downgradient monitoring wells because the impacted monitoring wells around the LCPB are generally located downgradient of the LCPA.
- **LCPB Construction** - The LCPB was constructed with an engineered liner system consisting of a 60-mil High Density Polyethylene (HDPE) geomembrane liner with a minimum bottom elevation of approximately 460 feet above mean sea level (FT MSL). The low permeability HDPE liner system in the LCPB is a barrier to the migration of CCR influenced liquids and provides containment for CCR. The LCPA is unlined and was built in the early 1970s and has a bottom elevation estimated at approximately 410 FT MSL, which is much deeper than the LCPB. In addition to the distinct pore-water fingerprint for LCPA relative to LCPB, there are elevated concentrations of CCR indicators in the intermediate and deep zones of groundwater in the alluvial aquifer surrounding the LCPA, as shown in the LCPA Annual Reports. Around the LCPA, impacts are present in the shallow, intermediate (middle), and deep alluvial zones, and are not isolated to the shallow zone, where LCPB impacts would most readily occur. The impacts to the intermediate and deep alluvial zones are most likely from the LCPA, where the base elevation extends into deeper groundwater zones in the aquifer.

In summary, groundwater chemistry, pore-water chemistry fingerprints, cell construction, and hydrogeological evidence all demonstrate that SSIs reported for the May 2023 Sampling Event for the LCPB CCR Unit were not caused by impacts from the LCPB surface impoundment. The LCPA surface impoundment, located immediately adjacent to the LCPB, is the source of the SSIs for groundwater in the LCPB monitoring well network.

4.0 CERTIFICATION STATEMENT

This *LCPB – Alternative Source Demonstration – May 2023 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 Rocksmith Geoengineering, LLC.

I hereby certify that this *LCPB – Alternative Source Demonstration – May 2023 Sampling Event* located at 226 Labadie Power Plant Road, Labadie, Missouri 63055 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

Rocksmith Geoengineering, LLC

_____

Mark Haddock, P.E., R.G.
Principal Engineer, Senior Partner

Attachments: Table 1 – May 2023 Detection Monitoring Results
Figure 1 – LCPB Piper Diagram for May 2023
Appendix A – FALCON Analysis Calculation Package

Tables

Table 1
May 2023 Detection Monitoring Results
LCPB Surface Impoundment
Labadie Energy Center, Franklin County, MO

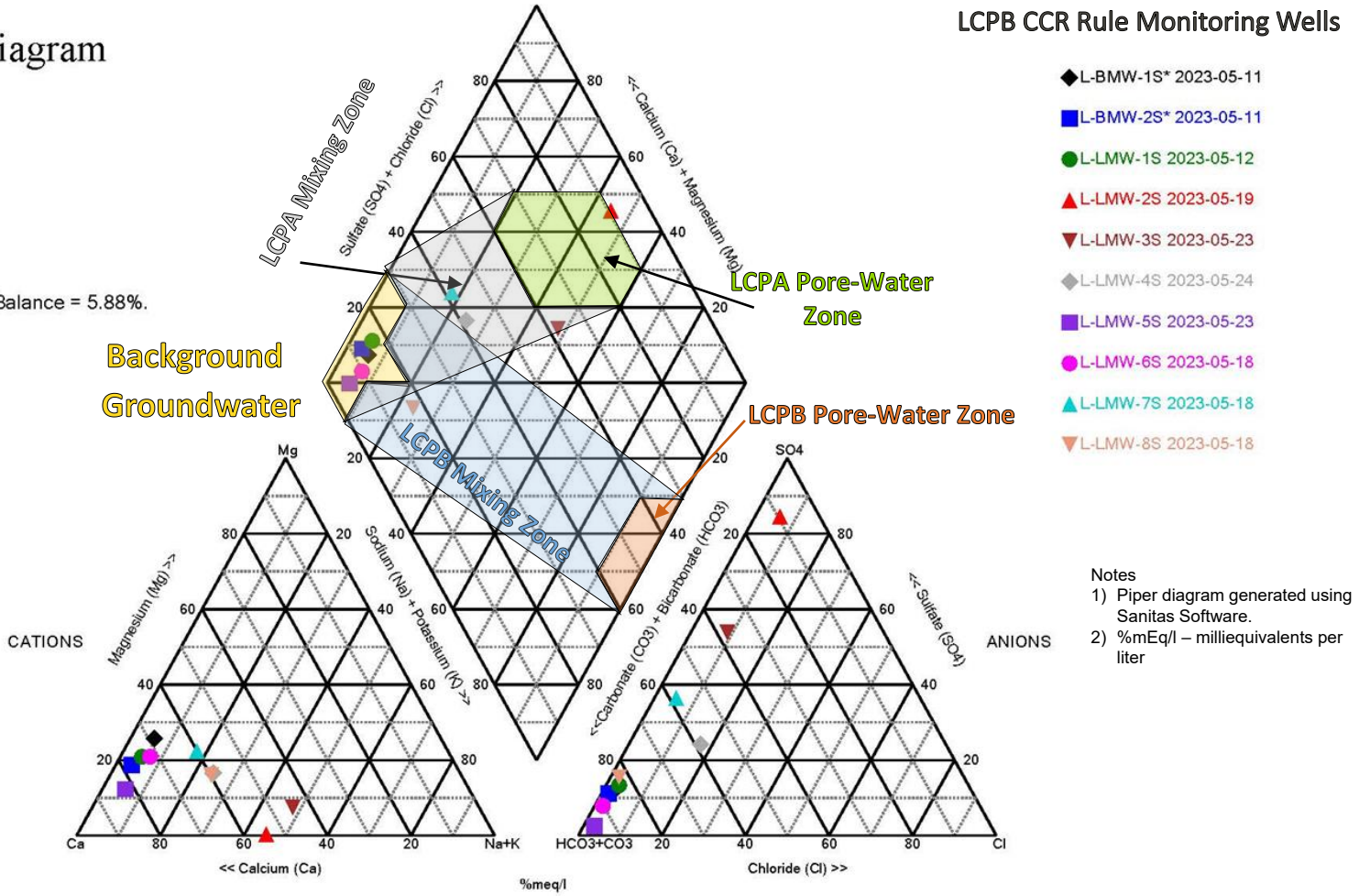
			BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	PREDICTION LIMITS	BMW-1S	BMW-2S	LMW-1S	LMW-2S	LMW-3S	LMW-4S	LMW-5S	LMW-6S	LMW-7S	LMW-8S
May 2023 Detection Monitoring Event												
DATE	NA	NA	5/11/2023	5/11/2023	5/12/2023	5/19/2023	5/23/2023	5/24/2023	5/23/2023	5/18/2023	5/18/2023	5/18/2023
pH	SU	6.416-7.307	6.76	7.03	7.09	9.55	7.34	6.86	6.80	6.87	6.84	7.27
BORON, TOTAL	µg/L	141.2	88.2 J	45.3 J	930	3,180	4,300	4,580	40.6 J	1,060	7,890	1,050
CALCIUM, TOTAL	µg/L	221,000	191,000	141,000	109,000	79,600	88,400	163,000	153,000	119,000	161,000	81,900
CHLORIDE, TOTAL	mg/L	7.564	6.6	2.2	4.6	14.6	27.0	66.0	4.9	3.0	18.7	1.6
FLUORIDE, TOTAL	mg/L	0.2154	ND	ND	ND	ND	0.20 J	ND	ND	ND	ND	0.36
SULFATE, TOTAL	mg/L	75.18	65.9	39.7	40.3	311	251 J	133	8.5	26.8	209	44.7
TOTAL DISSOLVED SOLIDS	mg/L	828	801	607	597	567	693	767	503	448	800	400
July 2023 Verification Sampling Event												
DATE	NA	NA					7/13/2023					
pH	SU	6.416-7.307					7.12					
BORON, TOTAL	µg/L	141.2										
CALCIUM, TOTAL	µg/L	221,000										
CHLORIDE, TOTAL	mg/L	7.564										
FLUORIDE, TOTAL	mg/L	0.2154										
SULFATE, TOTAL	mg/L	75.18										
TOTAL DISSOLVED SOLIDS	mg/L	828										

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

Prepared By: GTM
Checked By: JSI
Reviewed By: MNH

Figures

Piper Diagram



Notes
1) Piper diagram generated using Sanitas Software.
2) %mEq/l – milliequivalents per liter

CLIENT/PROJECT **AMEREN MISSOURI** **LABADIE ENERGY CENTER**					TITLE **LCPB Piper Diagram for May 2023**	
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2023-09-01		Rev No. NA	JOB NO. 23007	FIGURE **1**

Appendix A
FALCON Analysis Calculation Package

Technical Memorandum

December 26, 2023

To:	Ameren Missouri 1901 Chouteau Ave, St. Louis, MO 63103	**Proposal Number:**	23007
From:	Mark Haddock, P.E., R.G., Jeff Ingram, R.G.	**Email:**	jeff.ingram@rocksmithgeo.com
RE:	**Appendix A – LCPB FALCON Analysis Calculation Package**		

1.0 OBJECTIVE

The objective of this Technical Memorandum calculation package is to determine if there is a correlation between the ion ratio fingerprints in the LCPA pore-water, LCPB pore-water or background groundwater with the compliance monitoring well samples in the alluvial aquifer at the Labadie Energy Center (LEC).

2.0 FINGERPRINT ANALYSIS OF LEACHATE CONTAMINANTS (FALCON) METHOD

The Fingerprint Analysis of Leachate Contaminants (FALCON) method was developed in 2004 by the United States Environmental Protection Agency (USEPA) as a tool to identify the source of impacts within groundwater. The FALCON method compiles ion ratios for multiple constituents in order to develop a distinctive chemical fingerprint for each possible contaminant source and un-impacted background groundwater. These fingerprints were correlated to well sample data downgradient of the sources and are used to characterize the source of the contaminant plume. For this calculation, background groundwater quality is derived from samples collected in background wells located approximately 2 to 2.5 miles west of the LCPB. Source data are from pore-water collected from piezometers within the LCPA and LCPB. Fingerprints from these three sources (background groundwater, LCPA pore-water and LCPB pore-water) were compared to data from alluvial aquifer monitoring well sampling locations at the LEC. Data from the LCPA and LCPB pore-water are from the November 2017 ASD for the LCPB, which is available in the 2019 Annual Report for the LCPB. Data from the background and compliance monitoring wells are from the May 2023 sampling event.

3.0 SELECTION OF CONSTITUENTS TO USE

The first step in completing the FALCON analysis was to select a subset of constituents that are representative of the potential source areas. When selecting these constituents, it is important to include constituents that are mobile in the hydrogeological environment and that can uniquely characterize each water type. Constituents selected included major cation and anion constituents that represent groundwater chemistry and key indicators of CCR impacts. Values of the three different sources were compared to see which constituents fit the criteria. A summary table of the values used for the three sources is provided in **Table 1**. The following constituents were selected to complete the FALCON analysis:

- Alkalinity
- Total Boron
- Total Calcium
- Total Chloride
- Total Fluoride
- Total Iron
- Total Magnesium
- Total Manganese
- Total Potassium
- Total Sodium
- Total Sulfate

4.0 DATA TABULATION AND NORMALIZATION

Once the constituents were selected, the data were tabulated, normalized and a graphical presentation of the fingerprints was produced. The data used, along with the normalization percentages, are provided in **Table 1** for the three different sources (background groundwater, LCPA pore-water, and LCPB pore-water) as well as for each monitoring well evaluated. Correlations were then completed between the different sources to determine each source's reproducibility. Tables displaying the FALCON correlations are provided below in **Tables 2-4**.

Table 2 – Background Groundwater Correlations

LCPB Pore-water Correlations			
Well ID	*L-LCPB-1*	*L-LCPB-2*	*L-LCPB-3*
L-LCPB-1			
L-LCPB-2	99.6%		
L-LCPB-3	98.9%	99.5%	
Average Fingerprint Reproducibility			99.4%

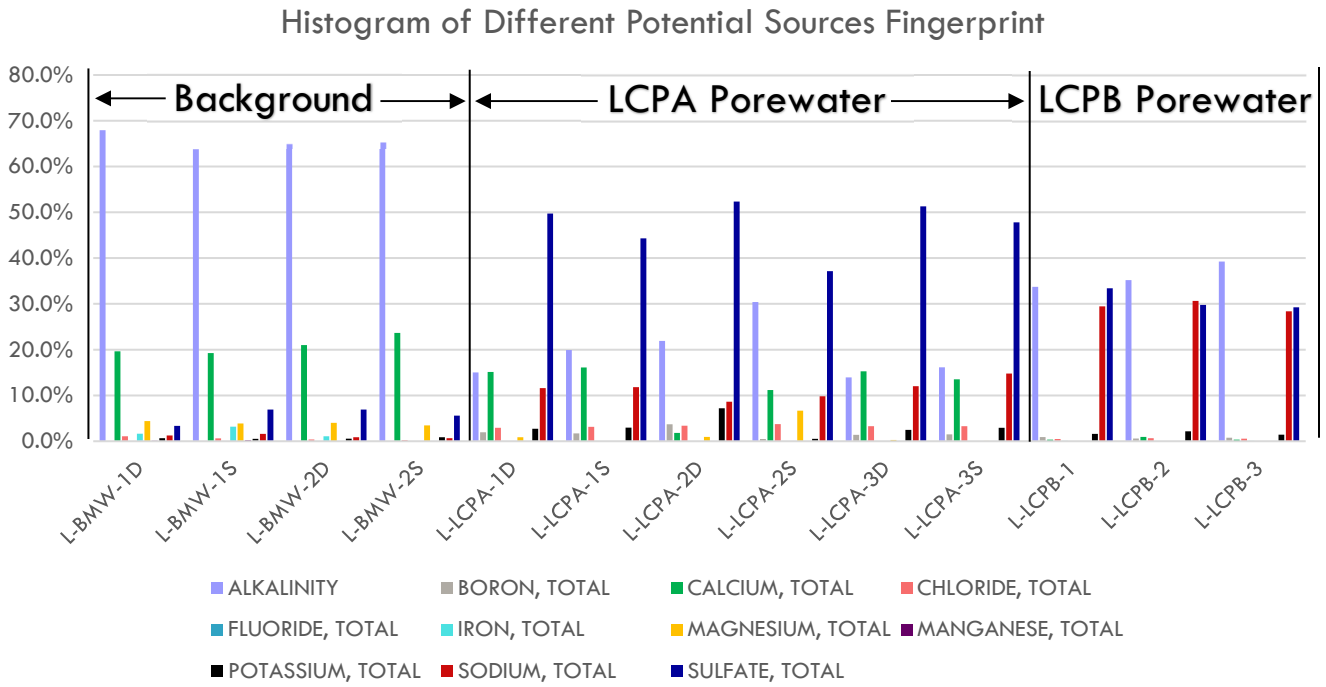
Table 3- LCPB Pore-water Correlations

LCPB Pore-water Correlations			
	L-LCPB-1	*L-LCPB-2*	*L-LCPB-3*
L-LCPB-1			
L-LCPB-2	99.6%		
L-LCPB-3	98.9%	99.5%	
Average Fingerprint Reproducibility			99.4%

Table 4 – LCPA Pore-water Correlations

Well ID	*L-LCPA-1D*	*L-LCPA-1S*	*L-LCPA-2D*	*L-LCPA-2S*	*L-LCPA-3D*	*L-LCPA-3S*
L-LCPA-1D						
L-LCPA-1S	98.9%					
L-LCPA-2D	94.5%	93.8%				
L-LCPA-2S	88.9%	93.3%	90.0%			
L-LCPA-3D	99.9%	98.5%	94.1%	87.6%		
L-LCPA-3S	99.6%	99.0%	94.8%	89.8%	99.5%	
Average Fingerprint Reproducibility						94.8%
Average Fingerprint Reproducibility with LCPA-1S, LCPA-1D, LCPA-2D, LCPA-3S and LCPA-3D						97.2%

Additionally, **Figure 1** below displays a histogram of the different source water normalizations.



As described in the ASD report for the November 2017 monitoring results (provided in the 2018 Annual Report for the LCPB), samples collected within the LCPA unit displayed less correlation due to the spatial variation of sample locations and differing CCR materials present in sample intervals. The LCPA has been in operation since the 1970s and there have been many changes to CCR received by the LCPA during this time. These include changes in types of coal used onsite, types of CCR placed in the facility (pre-LCPB construction vs. post-LCPB construction), and types of CCR placed within the unit. While not as evident using the constituents available for this evaluation, no Appendix IV constituents were tested because LCPB is under detection monitoring. When compared with the 2018 evaluation, LCPA-2S still appears to have a weaker correlation (<90% in this case) and was evaluated separately. Separating the LCPA into two potential sources (one for LCPA-1S, -1D, -2D, -3S, -3D and one for LCPA-2S) more accurately reflects the conditions within the LCPA due to its spatial variation of constituent concentrations.

5.0 CORRELATING DOWNGRADIENT GROUNDWATER SAMPLES WITH SOURCES

A correlation between the average groundwater concentration and the different source waters was completed to demonstrate which source better correlates with each alluvial aquifer groundwater sample. Results from this correlation are provided in **Table 5** and the values used for this correlation are provided in **Table 1**. The results demonstrate that groundwater in the alluvial aquifer correlates better with the LCPA pore-water or background groundwater than it does with the LCPB pore-water. In no case did a downgradient groundwater sample correlate better with the LCPB pore-water than with the LCPA pore-water or background groundwater.

Table 5 – Summary of May 2023 USEPA FALCON Evaluation

Piezometer or Well ID	Percent Correlation				Highest (Best) Correlation
	Background Groundwater	LCPB Average	LCPA Average (LCPA-1S/D, LCPA-2D & LCPA-3S/D)	LCPA-2S	
L-BMW-1D	100%	56%	31%	60%	Background
L-BMW-1S	100%	59%	34%	62%	Background
L-BMW-2D	100%	58%	35%	63%	Background
L-BMW-2S	100%	57%	35%	62%	Background
L-AM-1D	46%	83%	98%	97%	LCPA-Average
L-AM-1S	97%	54%	25%	53%	Background
L-AMW-8	28%	75%	99%	91%	LCPA-Average
L-LMW-1S	100%	59%	37%	64%	Background
L-LMW-2S	9%	62%	95%	82%	LCPA-Average
L-LMW-3S	64%	90%	92%	98%	LCPA-2S
L-LMW-4S	96%	72%	54%	77%	Background
L-LMW-5S	100%	54%	28%	57%	Background
L-LMW-6S	100%	57%	32%	60%	Background
L-LMW-7S	93%	76%	66%	86%	Background
L-LMW-8S	99%	67%	40%	67%	Background
L-MW-24	81%	35%	34%	56%	Background
L-MW-26	100%	58%	35%	63%	Background
L-MW-33(D)	20%	69%	98%	88%	LCPA-Average
L-MW-34(D)	40%	76%	98%	95%	LCPA-Average
L-MW-35(D)	82%	84%	81%	95%	LCPA-2S
L-S-1	100%	55%	29%	58%	Background
L-TMW-1	100%	58%	35%	63%	Background
L-TMW-2	99%	62%	42%	69%	Background
L-TMW-3	100%	57%	32%	61%	Background
L-TP-1D	100%	55%	28%	58%	Background
L-TP-2D	89%	82%	71%	90%	LCPA-2S
L-TP-2M	88%	83%	72%	90%	LCPA-2S
L-TP-3D	21%	74%	97%	89%	LCPA-Average
L-TP-3M	71%	86%	89%	98%	LCPA-2S
L-TP-4D	90%	74%	70%	89%	Background
L-UMW-1D	100%	57%	28%	58%	Background
L-UMW-2D	91%	80%	69%	88%	Background
L-UMW-3D	43%	71%	84%	83%	LCPA-Average
L-UMW-4D	16%	73%	97%	86%	LCPA-Average
L-UMW-5D	26%	73%	99%	90%	LCPA-Average
L-UMW-6D	4%	59%	94%	79%	LCPA-Average
L-UMW-7D	100%	56%	28%	57%	Background
L-UMW-8D	99%	62%	32%	61%	Background
L-UMW-9D	99%	53%	24%	54%	Background

Notes

1) Values display percent correlation between data collected in May 2023 for each monitoring well and the LPCA, LCPB or background fingerprints.
2) The higher values are shaded darker and indicate better correlation.
3) More information on the calculation of these numbers is provided in Table 1.

Tables

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-BMW-1D	L-BMW-1S	L-BMW-2D	L-BMW-2S	L-AM-1D	L-AM-1S	L-AMW-8
ALKALINITY	mg/L	422	674	437	408	182	584	93.8
BORON, TOTAL	mg/L	0.0724	0.0882	0.0615	0.0453	8.34	0.305	7.22
CALCIUM, TOTAL	mg/L	124	191	137	141	109	189	71.6
CHLORIDE, TOTAL	mg/L	8.20	6.60	2.30	2.20	42.2	125	24.2
FLUORIDE, TOTAL	mg/L	0.06	0.06	0.06	0.06	0.27	0.06	0.27
IRON, TOTAL	mg/L	10.1	24.7	6.92	0.0129	5.00	14.9	2.22
MAGNESIUM, TOTAL	mg/L	27.9	42.9	27.8	20.9	13.3	35.8	11.2
MANGANESE, TOTAL	mg/L	0.60	2.51	0.267	0.00130	0.276	1.92	0.334
POTASSIUM, TOTAL	mg/L	4.19	5.06	3.80	5.80	8.96	7.53	6.09
SODIUM, TOTAL	mg/L	7.89	15.8	5.88	4.58	109	69.1	78.3
SULFATE, TOTAL	mg/L	26.0	65.9	45.1	39.7	312	2.60	259
Sum		631.0	1028.6	666.2	622.3	790.3	1030.2	554.2

Analyte	L-BMW-1D	L-BMW-1S	L-BMW-2D	L-BMW-2S	L-AM-1D	L-AM-1S	L-AMW-8
ALKALINITY	67%	66%	66%	66%	23%	57%	17%
BORON, TOTAL	0.011%	0.0086%	0.0092%	0.0073%	1.1%	0.03%	1.3%
CALCIUM, TOTAL	20%	19%	21%	23%	14%	18%	13%
CHLORIDE, TOTAL	1.3%	0.64%	0.35%	0.35%	5.3%	12%	4.4%
FLUORIDE, TOTAL	0.0095%	0.0058%	0.009%	0.0096%	0.034%	0.0058%	0.049%
IRON, TOTAL	1.6%	2.4%	1%	0.0021%	0.63%	1.4%	0.4%
MAGNESIUM, TOTAL	4.4%	4.2%	4.2%	3.4%	1.7%	3.5%	2%
MANGANESE, TOTAL	0.095%	0.24%	0.04%	0.00021%	0.035%	0.19%	0.06%
POTASSIUM, TOTAL	0.66%	0.49%	0.57%	0.93%	1.1%	0.73%	1.1%
SODIUM, TOTAL	1.3%	1.5%	0.88%	0.74%	14%	6.7%	14%
SULFATE, TOTAL	4.1%	6.4%	6.8%	6.4%	39%	0.25%	47%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from May 2023 samples collected for the CCR Rule.
2) mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Prepared By: JSI
Checked By: GTM
Reviewed By: MNH

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-LMW-1S	L-LMW-2S	L-LMW-3S	L-LMW-4S	L-LMW-5S	L-LMW-6S	L-LMW-7S
ALKALINITY	mg/L	327	44.6	224	414	445	402	431
BORON, TOTAL	mg/L	0.93	3.18	4.30	4.58	0.0406	1.06	7.89
CALCIUM, TOTAL	mg/L	109	79.6	88.4	163	153	119	161
CHLORIDE, TOTAL	mg/L	4.60	14.6	27.0	66.0	4.90	3.00	18.7
FLUORIDE, TOTAL	mg/L	0.06	0.06	0.20	0.06	0.06	0.06	0.06
IRON, TOTAL	mg/L	0.43	0.0257	5.77	5.84	0.0402	8.16	3.63
MAGNESIUM, TOTAL	mg/L	18.8	0.104	8.86	27.6	14.0	21.1	36.2
MANGANESE, TOTAL	mg/L	0.587	0.0016	0.572	1.43	0.0071	1.14	1.58
POTASSIUM, TOTAL	mg/L	3.44	9.67	7.95	6.57	3.40	4.61	7.10
SODIUM, TOTAL	mg/L	7.04	69.9	105	74.7	9.38	10.8	50.8
SULFATE, TOTAL	mg/L	40.3	311	251	133	8.5	26.8	209
Sum		512.2	532.7	723.1	896.8	638.3	597.7	927.0

Analyte	L-LMW-1S	L-LMW-2S	L-LMW-3S	L-LMW-4S	L-LMW-5S	L-LMW-6S	L-LMW-7S
ALKALINITY	64%	8.4%	31%	46%	70%	67%	46%
BORON, TOTAL	0.18%	0.6%	0.59%	0.51%	0.0064%	0.18%	0.85%
CALCIUM, TOTAL	21%	15%	12%	18%	24%	20%	17%
CHLORIDE, TOTAL	0.9%	2.7%	3.7%	7.4%	0.77%	0.5%	2%
FLUORIDE, TOTAL	0.012%	0.011%	0.028%	0.0067%	0.0094%	0.01%	0.0065%
IRON, TOTAL	0.084%	0.0048%	0.8%	0.65%	0.0063%	1.4%	0.39%
MAGNESIUM, TOTAL	3.7%	0.02%	1.2%	3.1%	2.2%	3.5%	3.9%
MANGANESE, TOTAL	0.11%	0.0003%	0.079%	0.16%	0.0011%	0.19%	0.17%
POTASSIUM, TOTAL	0.67%	1.8%	1.1%	0.73%	0.53%	0.77%	0.77%
SODIUM, TOTAL	1.4%	13%	15%	8.3%	1.5%	1.8%	5.5%
SULFATE, TOTAL	7.9%	58%	35%	15%	1.3%	4.5%	23%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from May 2023 samples collected for the CCR Rule.
2) mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Prepared By: JSI
Checked By: GTM
Reviewed By: MNH

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-LMW-8S	L-MW-24	L-MW-26	L-MW-33(D)	L-MW-34(D)	L-MW-35(D)	L-S-1
ALKALINITY	mg/L	302	98.1	435	111	175	316	474
BORON, TOTAL	mg/L	1.05	0.0523	0.0456	9.71	10.1	7.69	0.0755
CALCIUM, TOTAL	mg/L	81.9	111	140	110	121	119	149
CHLORIDE, TOTAL	mg/L	1.60	4.80	14.2	25.2	26.1	13.9	1.40
FLUORIDE, TOTAL	mg/L	0.36	0.06	0.06	0.21	0.06	0.06	0.06
IRON, TOTAL	mg/L	0.742	0.0409	0.01350	5.99	6.85	5.6	0.0237
MAGNESIUM, TOTAL	mg/L	13.2	21.8	26.0	23.0	29.1	27.0	21.5
MANGANESE, TOTAL	mg/L	0.0481	0.00610	0.0114	0.294	0.305	0.403	0.117
POTASSIUM, TOTAL	mg/L	3.88	3.91	3.97	7.56	7.50	5.12	27.7
SODIUM, TOTAL	mg/L	35.3	6.17	4.91	99.6	83.3	70.8	6.70
SULFATE, TOTAL	mg/L	44.7	25.1	44.4	420	370	237	18.3
Sum		484.8	271.0	668.6	812.6	829.3	802.6	698.9

Analyte	L-LMW-8S	L-MW-24	L-MW-26	L-MW-33(D)	L-MW-34(D)	L-MW-35(D)	L-S-1
ALKALINITY	62%	36%	65%	14%	21%	39%	68%
BORON, TOTAL	0.22%	0.019%	0.0068%	1.2%	1.2%	0.96%	0.011%
CALCIUM, TOTAL	17%	41%	21%	14%	15%	15%	21%
CHLORIDE, TOTAL	0.33%	1.8%	2.1%	3.1%	3.1%	1.7%	0.2%
FLUORIDE, TOTAL	0.074%	0.022%	0.009%	0.026%	0.0072%	0.0075%	0.0086%
IRON, TOTAL	0.15%	0.015%	0.002%	0.74%	0.83%	0.7%	0.0034%
MAGNESIUM, TOTAL	2.7%	8%	3.9%	2.8%	3.5%	3.4%	3.1%
MANGANESE, TOTAL	0.0099%	0.0023%	0.0017%	0.036%	0.037%	0.05%	0.017%
POTASSIUM, TOTAL	0.8%	1.4%	0.59%	0.93%	0.9%	0.64%	4%
SODIUM, TOTAL	7.3%	2.3%	0.73%	12%	10%	8.8%	0.96%
SULFATE, TOTAL	9.2%	9.3%	6.6%	52%	45%	30%	2.6%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from May 2023 samples collected for the CCR Rule.
2) mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-TMW-1	L-TMW-2	L-TMW-3	L-TP-1D	L-TP-2D	L-TP-2M	L-TP-3D
ALKALINITY	mg/L	510	641	391	510	273	285	119
BORON, TOTAL	mg/L	0.103	0.109	0.0943	0.0635	1.44	1.21	10.5
CALCIUM, TOTAL	mg/L	163	204	122	145	97.5	109	104
CHLORIDE, TOTAL	mg/L	3.90	7.10	1.50	3.90	26.3	24.4	26.9
FLUORIDE, TOTAL	mg/L	0.15	0.17	0.13	0.14	0.33	0.33	0.17
IRON, TOTAL	mg/L	0.0294	0.297	0.217	9.01	3.53	3.33	4.45
MAGNESIUM, TOTAL	mg/L	38.5	54.7	24.0	36.4	17.3	16.8	23.1
MANGANESE, TOTAL	mg/L	0.037	2.97	0.113	0.257	0.322	0.476	0.175
POTASSIUM, TOTAL	mg/L	4.44	6.87	5.33	4.33	5.78	7.12	7.50
SODIUM, TOTAL	mg/L	9.68	11.7	6.25	11.0	59.7	70.1	132
SULFATE, TOTAL	mg/L	50.5	123	27.2	16.6	151	163	404
Sum		780.3	1051.9	577.8	736.7	636.2	680.8	831.8

Analyte	L-TMW-1	L-TMW-2	L-TMW-3	L-TP-1D	L-TP-2D	L-TP-2M	L-TP-3D
ALKALINITY	65%	61%	68%	69%	43%	42%	14%
BORON, TOTAL	0.013%	0.01%	0.016%	0.0086%	0.23%	0.18%	1.3%
CALCIUM, TOTAL	21%	19%	21%	20%	15%	16%	13%
CHLORIDE, TOTAL	0.5%	0.67%	0.26%	0.53%	4.1%	3.6%	3.2%
FLUORIDE, TOTAL	0.019%	0.016%	0.022%	0.019%	0.052%	0.048%	0.02%
IRON, TOTAL	0.0038%	0.028%	0.038%	1.2%	0.55%	0.49%	0.53%
MAGNESIUM, TOTAL	4.9%	5.2%	4.2%	4.9%	2.7%	2.5%	2.8%
MANGANESE, TOTAL	0.0047%	0.28%	0.02%	0.035%	0.051%	0.07%	0.021%
POTASSIUM, TOTAL	0.57%	0.65%	0.92%	0.59%	0.91%	1%	0.9%
SODIUM, TOTAL	1.2%	1.1%	1.1%	1.5%	9.4%	10%	16%
SULFATE, TOTAL	6.5%	12%	4.7%	2.3%	24%	24%	49%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from May 2023 samples collected for the CCR Rule.
2) mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Prepared By: JSI
Checked By: GTM
Reviewed By: MNH

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-TP-3M	L-TP-4D	L-UMW-1D	L-UMW-2D	L-UMW-3D	L-UMW-4D	L-UMW-5D
ALKALINITY	mg/L	217	296	572	330	61.4	72.1	96.9
BORON, TOTAL	mg/L	5.98	6.74	0.431	1.04	9.64	4.93	9.95
CALCIUM, TOTAL	mg/L	97.2	131	150	118	85.0	59.6	87.6
CHLORIDE, TOTAL	mg/L	23.9	13.6	8.20	40.4	25.1	25.4	23.9
FLUORIDE, TOTAL	mg/L	0.19	0.06	0.06	0.06	0.06	0.29	0.06
IRON, TOTAL	mg/L	6.94	5.71	19.5	3.58	0.194	0.258	0.0231
MAGNESIUM, TOTAL	mg/L	20.9	34.7	36.9	25.0	5.49	6.83	0.0485
MANGANESE, TOTAL	mg/L	0.938	0.356	0.432	0.409	0.154	0.295	0.0081
POTASSIUM, TOTAL	mg/L	5.35	4.88	6.41	7.65	9.44	7.92	13.6
SODIUM, TOTAL	mg/L	75.0	29.1	19.0	60.9	64.2	94.3	80.7
SULFATE, TOTAL	mg/L	215	172	20.4	172	99.2	286	292
Sum		668.4	694.1	833.3	759.0	359.9	557.9	604.8

Analyte	L-TP-3M	L-TP-4D	L-UMW-1D	L-UMW-2D	L-UMW-3D	L-UMW-4D	L-UMW-5D
ALKALINITY	32%	43%	69%	43%	17%	13%	16%
BORON, TOTAL	0.89%	0.97%	0.052%	0.14%	2.7%	0.88%	1.6%
CALCIUM, TOTAL	15%	19%	18%	16%	24%	11%	14%
CHLORIDE, TOTAL	3.6%	2%	0.98%	5.3%	7%	4.6%	4%
FLUORIDE, TOTAL	0.028%	0.0086%	0.0072%	0.0079%	0.017%	0.052%	0.0099%
IRON, TOTAL	1%	0.82%	2.3%	0.47%	0.054%	0.046%	0.0038%
MAGNESIUM, TOTAL	3.1%	5%	4.4%	3.3%	1.5%	1.2%	0.008%
MANGANESE, TOTAL	0.14%	0.051%	0.052%	0.054%	0.043%	0.053%	0.0013%
POTASSIUM, TOTAL	0.8%	0.7%	0.77%	1%	2.6%	1.4%	2.2%
SODIUM, TOTAL	11%	4.2%	2.3%	8%	18%	17%	13%
SULFATE, TOTAL	32%	25%	2.4%	23%	28%	51%	48%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from May 2023 samples collected for the CCR Rule.
2) mg/L - milligrams per liter.
3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Prepared By: JSI
Checked By: GTM
Reviewed By: MNH

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-UMW-6D	L-UMW-7D	L-UMW-8D	L-UMW-9D	L-LCPA-1D	L-LCPA-1S	L-LCPA-2D
ALKALINITY	mg/L	69.5	468	146	418	77.6	120	128
BORON, TOTAL	mg/L	9.24	0.906	0.665	0.0857	10.0	10.3	21.7
CALCIUM, TOTAL	mg/L	122	137	34.0	118	78.2	97.1	10.6
CHLORIDE, TOTAL	mg/L	19.9	5.90	2.50	22.7	15.2	18.9	19.8
FLUORIDE, TOTAL	mg/L	0.06	0.06	0.06	0.06	0.20	0.088	0.14
IRON, TOTAL	mg/L	0.478	13.2	5.21	24.3	0.178	0.138	0.0869
MAGNESIUM, TOTAL	mg/L	3.82	22.5	8.52	31.9	4.47	0.184	5.43
MANGANESE, TOTAL	mg/L	0.376	1.53	0.207	0.391	0.00410	0.00320	0.00250
POTASSIUM, TOTAL	mg/L	16.2	4.50	2.88	4.24	14.0	17.8	42.1
SODIUM, TOTAL	mg/L	132	15.8	13.0	14.2	60.0	71.1	50.5
SULFATE, TOTAL	mg/L	734	13.5	10.5	0.275	257	267	306
Sum		1107.6	682.9	223.5	634.2	516.9	602.6	584.4

Analyte	L-UMW-6D	L-UMW-7D	L-UMW-8D	L-UMW-9D	L-LCPA-1D	L-LCPA-1S	L-LCPA-2D
ALKALINITY	6.3%	69%	65%	66%	15%	20%	22%
BORON, TOTAL	0.83%	0.13%	0.3%	0.014%	1.9%	1.7%	3.7%
CALCIUM, TOTAL	11%	20%	15%	19%	15%	16%	1.8%
CHLORIDE, TOTAL	1.8%	0.86%	1.1%	3.6%	2.9%	3.1%	3.4%
FLUORIDE, TOTAL	0.0054%	0.0088%	0.027%	0.0095%	0.039%	0.015%	0.024%
IRON, TOTAL	0.043%	1.9%	2.3%	3.8%	0.034%	0.023%	0.015%
MAGNESIUM, TOTAL	0.34%	3.3%	3.8%	5%	0.86%	0.031%	0.93%
MANGANESE, TOTAL	0.034%	0.22%	0.093%	0.062%	0.00079%	0.00053%	0.00043%
POTASSIUM, TOTAL	1.5%	0.66%	1.3%	0.67%	2.7%	3%	7.2%
SODIUM, TOTAL	12%	2.3%	5.8%	2.2%	12%	12%	8.6%
SULFATE, TOTAL	66%	2%	4.7%	0.043%	50%	44%	52%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

1) Values for CCR Rule monitoring wells from May 2023; Values for pore-water samples from LCPB ASD Investigation collected in February-March 2018.

2) mg/L - milligrams per liter.

3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Table 1
Summary of Concentrations Used for FALCON Correlation
LCPB Anternative Source Demonstration
Labadie Energy Center, Franklin County, MO

Analyte	Units	L-LCPA-2S	L-LCPA-3D	L-LCPA-3S	L-LCPB-1	L-LCPB-2	L-LCPB-3
ALKALINITY	mg/L	208	80.2	91.8	1070	861	1340
BORON, TOTAL	mg/L	3.36	8.10	8.44	28.2	14.8	25.7
CALCIUM, TOTAL	mg/L	76.5	87.7	76.9	11.4	22.6	11.4
CHLORIDE, TOTAL	mg/L	25.5	18.9	18.6	15.6	16.2	18.4
FLUORIDE, TOTAL	mg/L	0.170	0.160	0.160	2.40	1.00	1.90
IRON, TOTAL	mg/L	0.0279	0.122	0.112	0.0273	0.129	0.384
MAGNESIUM, TOTAL	mg/L	45.5	1.54	0.445	0.0844	0.0874	0.386
MANGANESE, TOTAL	mg/L	0.0392	0.00230	0.00250	0.00250	0.00250	0.00230
POTASSIUM, TOTAL	mg/L	3.54	14.2	16.6	51.0	52.6	48.2
SODIUM, TOTAL	mg/L	67.2	69.0	84.0	935	750	969
SULFATE, TOTAL	mg/L	254	295	272	1060	728	999
Sum		683.8	574.9	569.1	3173.7	2446.4	3414.4

Analyte	L-LCPA-2S	L-LCPA-3D	L-LCPA-3S	L-LCPB-1	L-LCPB-2	L-LCPB-3
ALKALINITY	30%	14%	16%	34%	35%	39%
BORON, TOTAL	0.49%	1.4%	1.5%	0.89%	0.6%	0.75%
CALCIUM, TOTAL	11%	15%	14%	0.36%	0.92%	0.33%
CHLORIDE, TOTAL	3.7%	3.3%	3.3%	0.49%	0.66%	0.54%
FLUORIDE, TOTAL	0.025%	0.028%	0.028%	0.076%	0.041%	0.056%
IRON, TOTAL	0.0041%	0.021%	0.02%	0.00086%	0.0053%	0.011%
MAGNESIUM, TOTAL	6.7%	0.27%	0.078%	0.0027%	0.0036%	0.011%
MANGANESE, TOTAL	0.0057%	0.0004%	0.00044%	0.000079%	0.0001%	0.000067%
POTASSIUM, TOTAL	0.52%	2.5%	2.9%	1.6%	2.2%	1.4%
SODIUM, TOTAL	9.8%	12%	15%	29%	31%	28%
SULFATE, TOTAL	37%	51%	48%	33%	30%	29%
Sum	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes

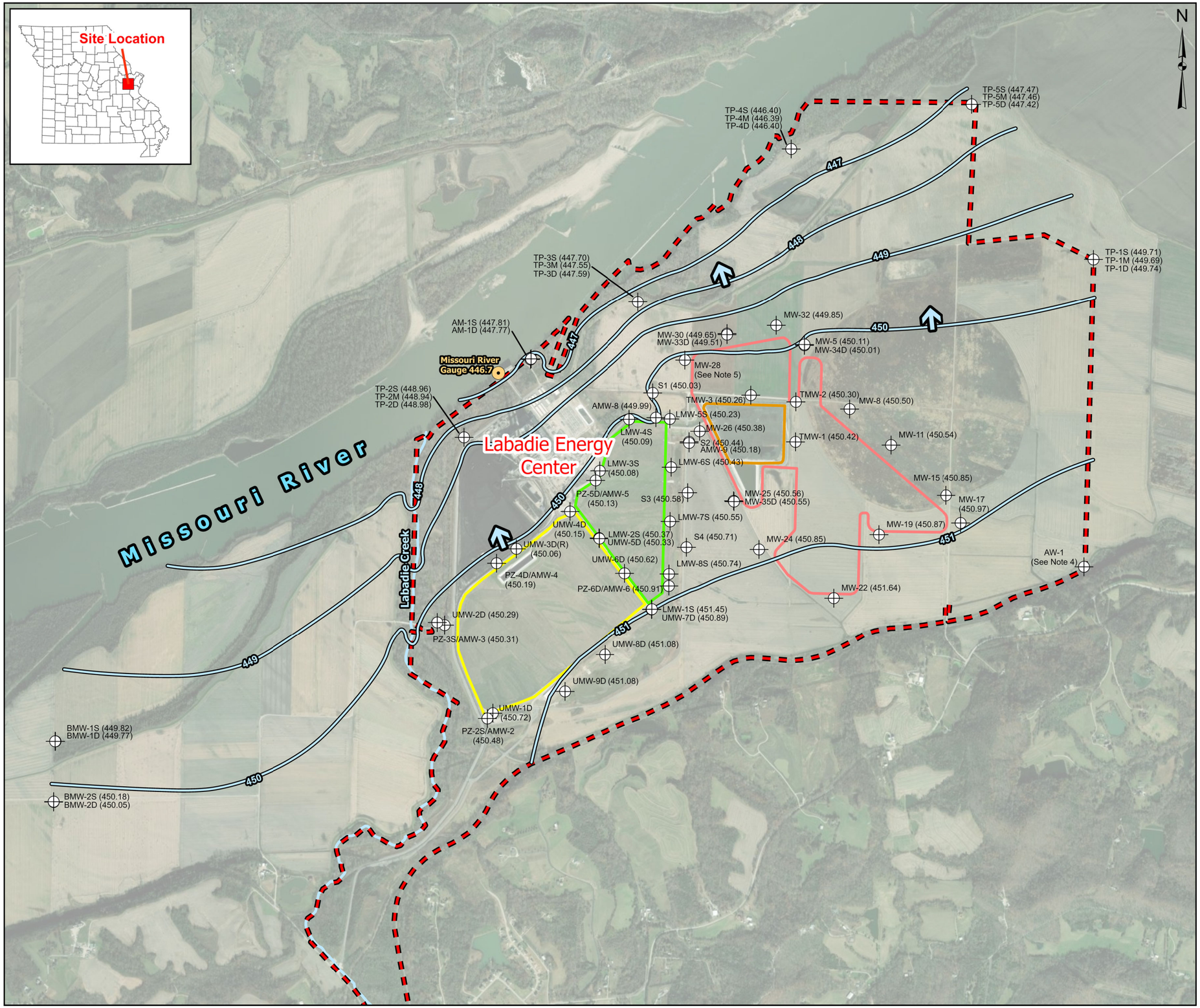
1) Values for CCR Rule monitoring wells from May 2023; Values for pore-water samples from LCPB ASD Investigation collected in February-March 2018.

2) mg/L - milligrams per liter.

3) One-half the value of the Method Detection Limit (MDL) is used for non-detect values.

Prepared By: JSI
Checked By: GTM
Reviewed By: MNH

Appendix D
2023 Potentiometric Surface Maps



TITLE

JANUARY 4, 2023 POTENTIOMETRIC SURFACE MAP

Legend

- Labadie Energy Center Property Boundary

CCR Units

- LCPA - Closed Bottom Ash Surface Impoundment
- LCPB - Closed Fly Ash Surface Impoundment
- LCL1 - Utility Waste Landfill Cell 1
- Proposed Final UWL Fence Perimeter

Monitoring Well or Piezometer

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge

Groundwater Elevation Contours

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

NOTES

1. All locations and boundaries are approximate.
2. Groundwater elevations displayed in FT MSL (Feet above Mean Sea Level).
3. Missouri River level obtained from USGS Labadie gauge 06935550.
4. AW-1 was not used in potentiometric surface contouring due to localized conditions causing an artificially high potentiometric elevation.
5. MW-28 was not used in potentiometric surface contouring due to measurement error.

REFERENCES

1. Zahner and Associates, Inc. 2016. Lot Consolidation Plat of "Labadie Energy Center" - Prepared for Ameren Missouri. Revised June 15, 2016.
2. USGS (United States Geological Survey), National Water Information System, USGS Gauge 06935550 Missouri River near Labadie, MO.

0 5001,000 2,000 3,000 4,000
Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

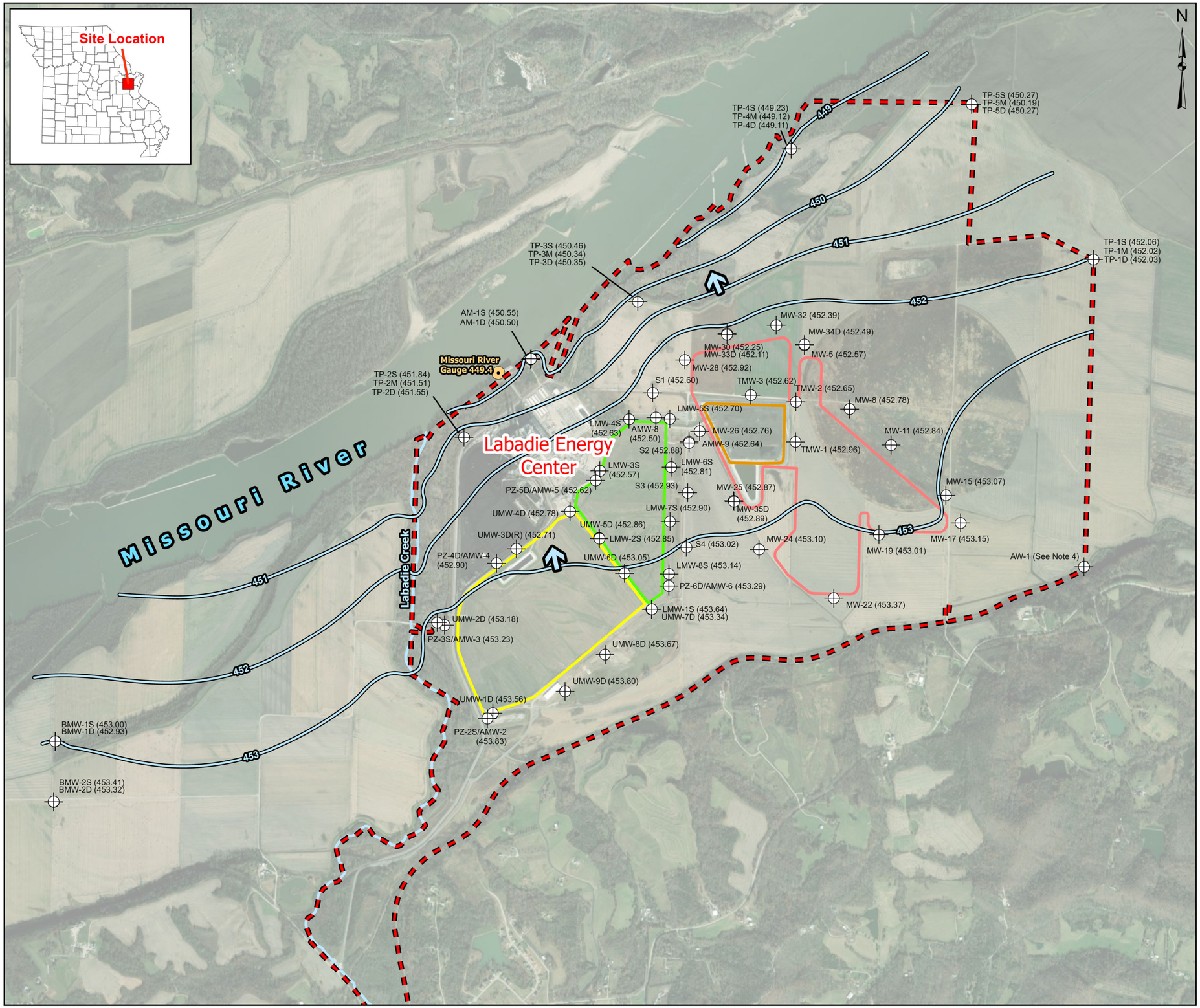
ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-03-09
PREPARED	JSI	PROJECT No.	23007
REVIEW	GTM		
APPROVED	MNH		

FIGURE D1

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

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.1-LEC4 1.2 - Production\POT MAPS\2023 Annual Report\230308_January2023VSPotMap.aprx



TITLE

MAY 10, 2023 POTENTIOMETRIC SURFACE MAP

Legend

- Labadie Energy Center Property Boundary

CCR Units

- LCPA - Closed Bottom Ash Surface Impoundment
- LCPB - Closed Fly Ash Surface Impoundment
- LCL1 - Utility Waste Landfill Cell 1
- Proposed Final UWL Fence Perimeter

Monitoring Well or Piezometer

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge

Groundwater Elevation Contours

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

NOTES

1. All locations and boundaries are approximate.
2. Groundwater elevations displayed in FT MSL (Feet above Mean Sea Level).
3. Missouri River Level obtained from USGS Labadie gauge 06935550.
4. AW-1 was not used in potentiometric surface contouring due to localized conditions causing an artificially high potentiometric elevation.

REFERENCES

1. Zahner and Associates, Inc. 2016. Lot Consolidation Plat of "Labadie Energy Center" - Prepared for Ameren Missouri. Revised June 15, 2016.
2. USGS (United States Geological Survey), National Water Information System, USGS Gauge 06935550 Missouri River near Labadie, MO.

0 5001,000 2,000 3,000 4,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-08-16
PREPARED	GTM	PROJECT No.	23007
REVIEW	JSI		
APPROVED	MNH		

FIGURE D2

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

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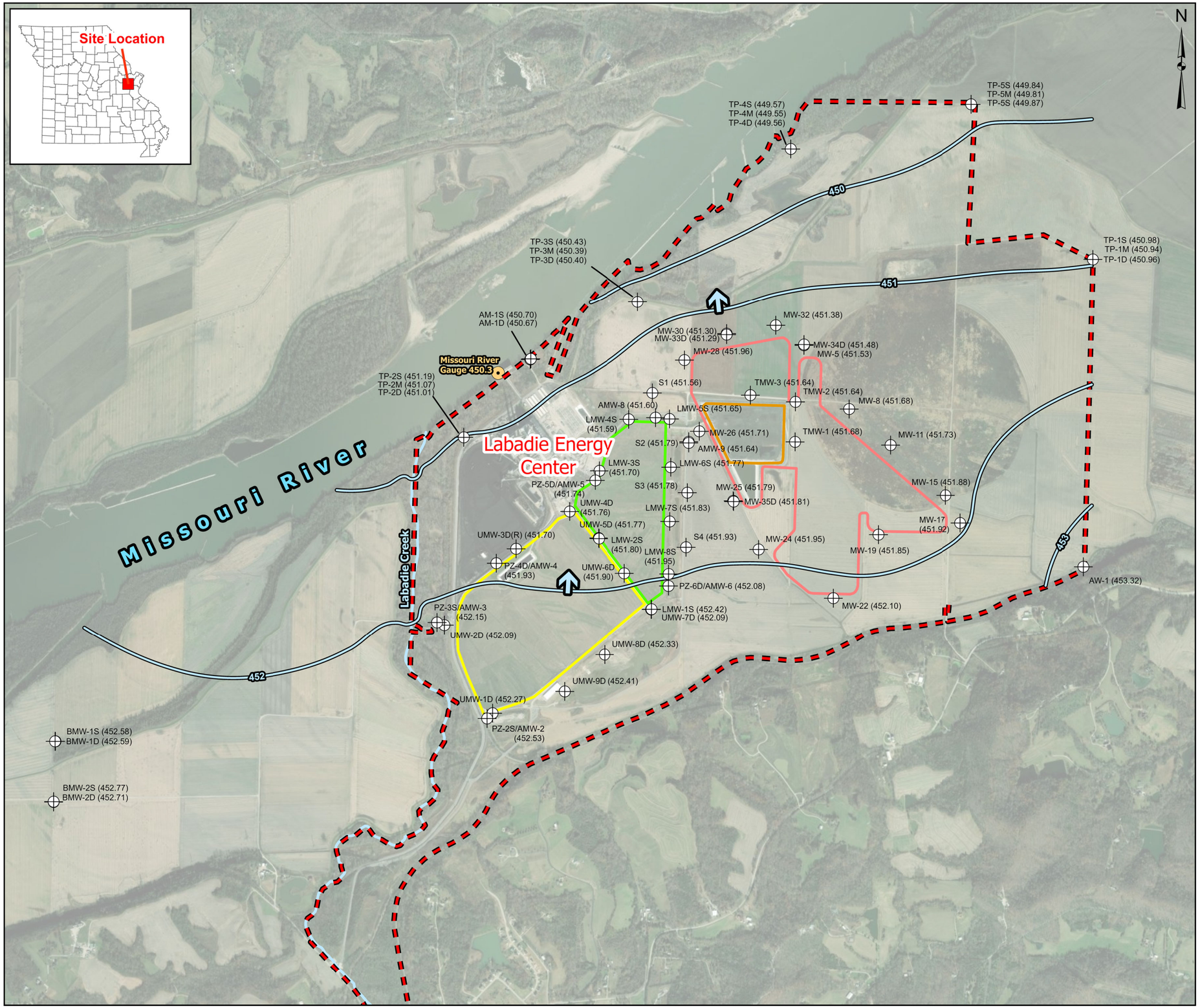
TITLE

JULY 12, 2023 POTENTIOMETRIC SURFACE MAP



Legend

- Labadie Energy Center Property Boundary

CCR Units

- LCPA - Closed Bottom Ash Surface Impoundment
- LCPB - Closed Fly Ash Surface Impoundment
- LCL1 - Utility Waste Landfill Cell 1
- Proposed Final UWL Fence Perimeter

Monitoring Well or Piezometer

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge

Groundwater Elevation Contours

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

NOTES

1. All locations and boundaries are approximate.
2. Groundwater elevations displayed in FT MSL (Feet above Mean Sea Level).
3. Missouri River Level obtained from USGS Labadie gauge 06935550.

REFERENCES

1. Zahner and Associates, Inc. 2016. Lot Consolidation Plat of "Labadie Energy Center" - Prepared for Ameren Missouri. Revised June 15, 2016.
2. USGS (United States Geological Survey), National Water Information System, USGS Gauge 06935550 Missouri River near Labadie, MO.

0 5001,000 2,000 3,000 4,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-08-18
PREPARED	GTM	PROJECT No.	23007
REVIEW	JSI		
APPROVED	MNH		

FIGURE D3

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

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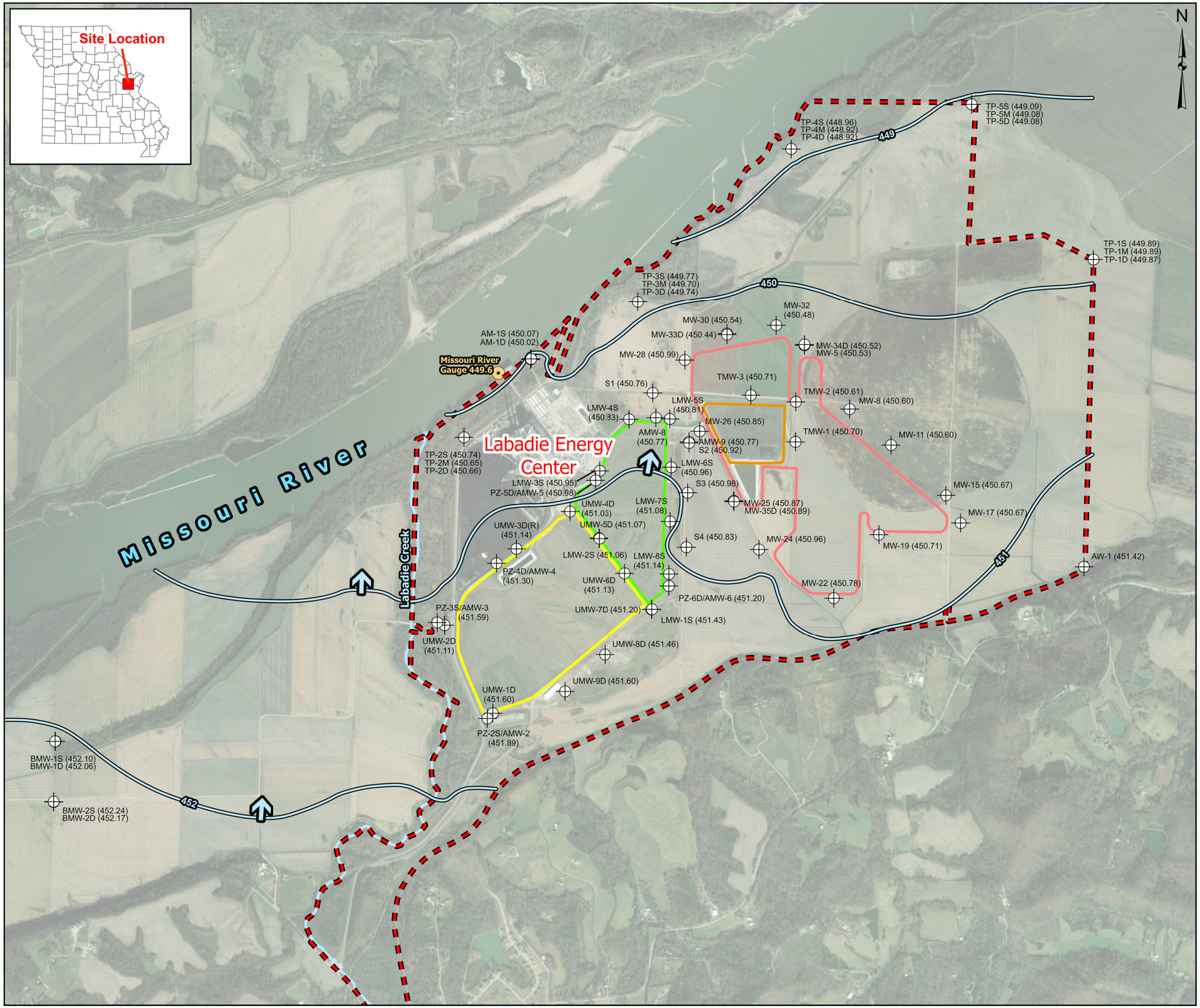

TITLE

NOVEMBER 15, 2023 POTENTIOMETRIC SURFACE MAP

Legend

- Labadie Energy Center Property Boundary

CCR Units

- LCPA - Closed Bottom Ash Surface Impoundment
- LCPB - Closed Fly Ash Surface Impoundment
- LCL1 - Utility Waste Landfill Cell 1
- Proposed Final UWL Fence Perimeter

Monitoring Well or Piezometer

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge

Groundwater Elevation Contours

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

NOTES

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0 5001,000 2,000 3,000 4,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-12-29
PREPARED	GTM	PROJECT No.	23007
REVIEW	JSI		
APPROVED	MNH		

FIGURE D4

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

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