REPORT

2023 Annual Groundwater Monitoring and Corrective Action Report

LCL1 – Utility Waste Landfill Cell 1, 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 LCL1 GROUNDWATER MONITORING PROGRAM

This annual report was developed to meet the requirements of United States Environmental Protection Agency (USEPA) 40 CFR Part 257 “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule” (the CCR Rule). The CCR Rule requires owners or operators of existing CCR units to produce an Annual Groundwater Monitoring and Corrective Action Report (Annual Report) each year (§§ 257.90(e)). Ameren Missouri (Ameren) has determined that the Utility Waste Landfill (UWL) at the Labadie Energy Center (LEC) is subject to the requirements of the CCR Rule. The UWL currently only operates LCL1 (Cell 1), which is an on-site landfill cell and manages Coal Combustion Residuals (CCR) from the facility. This Annual Report for the LCL1 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 LCL1 CCR unit has been operating under the Detection Monitoring Program (§257.94), which began October 17, 2017. As a part of Detection Monitoring, statistical evaluations are completed after each sampling event to determine if there are any values that represent a Statistically Significant Increase (SSI) over background concentrations. In 2023, 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 LCL1 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 24-27, 2022	November 22, 2022	Appendix III, Major Cations and Anions	**Calcium:** TMW-2 **Chloride:** MW-26, TMW-2 **Sulfate:** TMW-2 **TDS:** TMW-2	February 20, 2023	May 19, 2023
	Verification Sampling, January 5, 2023	January 19, 2023	Detected Appendix III parameters (See Note 1)			
May 2023 Sampling Event	Detection Monitoring, May 11-18, 2023	June 29, 2023	Appendix III, Major Cations and Anions	**Chloride:** MW-26 **Sulfate:** TMW-2 **TDS:** TMW-2	September 27, 2023	December 26, 2023
	Verification Sampling, July 13 & August 1, 2023	August 3 & 15, 2023	Detected Appendix III parameters (See Note 1)			
November 2023 Sampling Event	Detection Monitoring, November 16-17, 2023	January 25	Appendix III, Major Cations and Anions	To be determined after statistical analysis and Verification Sampling are completed in 2024.		

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

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

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

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1.0 INSTALLATION OR DECOMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the LCL1. The groundwater monitoring system consists of six 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 LCL1. For more information on the groundwater monitoring network, details are provided in the previous Annual Groundwater Monitoring Reports for the LCL1.

2.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the LCL1 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	MW-26	TMW-1	TMW-2	TMW-3	
	Date of Sample Collection						
January 2023 Verification Sampling	-	-	1/5/2023	-	1/5/2023	-	Detection
May 2023 Sampling Event	5/11/2023	5/11/2023	5/18/2023	5/16/2023	5/16/2023	5/16/2023	Detection
July-August 2023 Verification Sampling	-	-	7/13/2023	7/13/2023	8/1/2023	-	Detection
November 2023 Sampling Event	11/16/2023	11/16/2023	11/17/2023	11/17/2023	11/16/2023	11/17/2023	Detection
Total Number of Samples Collected	2	2	4	3	4	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 24-27, 2022. Verification sampling and the statistical analysis to evaluate for SSIs for the October 2022 event were not completed until 2023 and are therefore included in this report. Detection of Appendix III analytes above their respective prediction limits triggered a verification sampling event, which was completed on January 5, 2023 and verified SSIs. **Table 3** summarizes the results of the statistical analyses of the October 2022 Detection Monitoring event. Laboratory analytical data from the January 2023 verification sampling event through the October-November sampling event are provided in **Appendix A**.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. An Alternative Source Demonstration (ASD) was completed for these SSIs and is provided in **Appendix B**. This ASD demonstrates that SSIs at the monitoring wells around LCL1 are not caused by the LCL1 CCR unit and the LCL1 CCR unit remains in Detection Monitoring.

Detection Monitoring samples were collected May 11-18, 2023, and testing was completed for all Appendix III analytes, as well as major cations and anions. Detections above respective prediction limits for some Appendix III analytes triggered a verification sampling event, which was completed on July 13 as well as August 1, 2023. Three SSIs were verified. **Table 4** summarizes the results and statistical analyses of the May 2023 Detection Monitoring event. Laboratory analytical data from this sampling event is included in **Appendix A**. Similar to previous results, SSIs in the monitoring well network are not caused by the LCL1 CCR unit, demonstrated by the ASD provided in **Appendix C**.

A Detection Monitoring sampling event was completed November 16-17, 2023 and testing was performed for all Appendix III analytes, as well as major cations and anions. Statistical analyses to evaluate for SSIs in the November 2023 data were not completed in 2023 and the results will be provided in the 2024 Annual Report. **Table 5** summarizes the results of the November 2023 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

2.2 Groundwater Elevation, Flow Rate and Direction

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

Groundwater elevations were used to generate potentiometric surface maps included in **Appendix 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 LCL1 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
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
October 2022 Detection Monitoring Event											
DATE	NA	10/27/2022	10/27/2022	NA	10/24/2022	NA	10/26/2022	NA	10/25/2022	NA	10/26/2022
pH	SU	6.68	6.95	6.658-7.339	6.80	6.683-7.105	6.80	6.42-7.17	6.67	6.585-7.07	6.79
BORON, TOTAL	µg/L	91.2 J	45.3 J	102.8	68.3 J	121.6	115	134.3	115	136.9	98.3 J
CALCIUM, TOTAL	µg/L	185,000	146,000	155,150	128,000	183,389	159,000	205,487	246,000 J	202,001	134,000
CHLORIDE, TOTAL	mg/L	5.9	1.4	6.76	10.3 J	5.718	3.2 J	7.142	18.2	8.621	3.1
FLUORIDE, TOTAL	mg/L	ND	ND	0.2118	ND	0.2975	ND	0.2972	ND	0.2626	ND
SULFATE, TOTAL	mg/L	66.5	34.4	38.24	31.3	128	70.8	115.5	247 J	104	39.5
TOTAL DISSOLVED SOLIDS	mg/L	710	496	543.7	493	733.7	664	815.4	1,070	815.4	496
January 2023 Verification Sampling Event											
DATE	NA				1/5/2023				1/5/2023		
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L								288,000		
CHLORIDE, TOTAL	mg/L				8.7 J				32.9		
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L								390 J		
TOTAL DISSOLVED SOLIDS	mg/L								1,340		

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. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

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

Table 4
May 2023 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
May 2023 Detection Monitoring Event											
DATE	NA	5/11/2023	5/11/2023	NA	5/18/2023	NA	5/16/2023	NA	5/16/2023	NA	5/16/2023
pH	SU	6.76	7.03	6.658-7.339	7.01	6.683-7.105	6.91	6.42-7.17	6.89	6.585-7.07	6.97
BORON, TOTAL	µg/L	88.2 J	45.3 J	102.8	45.6 J	121.6	103	134.3	109	136.9	94.3 J
CALCIUM, TOTAL	µg/L	191,000	141,000	155,150	140,000	183,389	163,000	205,487	204,000	202,001	122,000 J
CHLORIDE, TOTAL	mg/L	6.6	2.2	6.76	14.2	5.718	3.9	7.142	7.1	8.621	1.5
FLUORIDE, TOTAL	mg/L	ND	ND	0.2118	ND	0.2975	0.15 J	0.2972	0.17 J	0.2626	0.13 J
SULFATE, TOTAL	mg/L	65.9	39.7	38.24	44.4	128	50.5	115.5	123	104	27.2
TOTAL DISSOLVED SOLIDS	mg/L	801	607	543.7	549	733.7	771 J	815.4	981	815.4	512
July-August 2023 Verification Sampling Event											
DATE	NA				7/13/2023		7/13/2023		8/1/2023		
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L				11.1						
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L				34.1 J				257		
TOTAL DISSOLVED SOLIDS	mg/L				533		602		1100		

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 were tested during Verification Sampling.

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

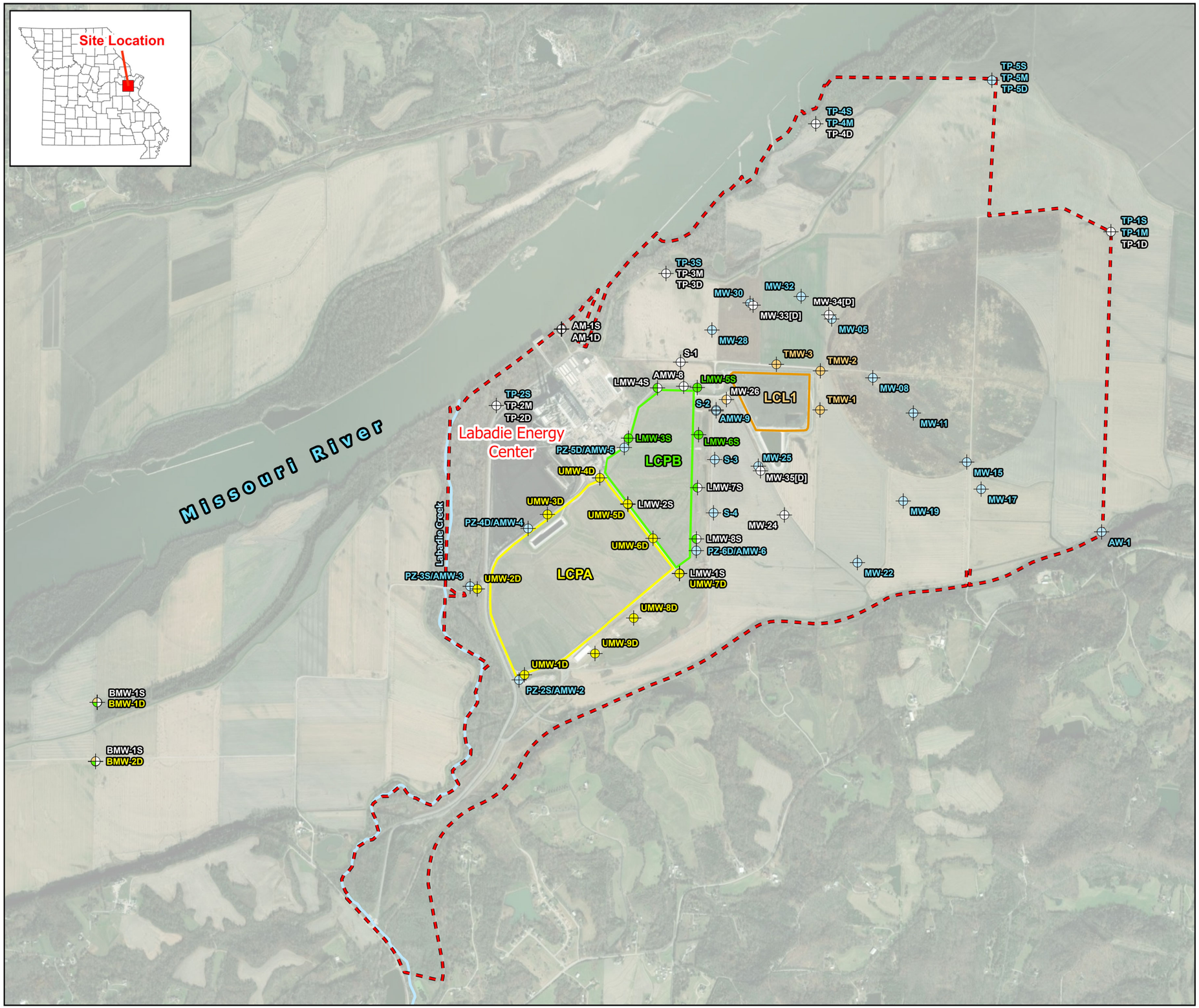
Table 5
November 2023 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS			
ANALYTE	UNITS	BMW-1S	BMW-2S	MW-26	TMW-1	TMW-2	TMW-3
November 2023 Detection Monitoring Event							
DATE	NA	11/16/2023	11/16/2023	11/17/2023	11/17/2023	11/16/2023	11/17/2023
pH	SU	6.71	7.04	7.02	7.02	6.83	6.94
BORON, TOTAL	µg/L	113	50.8 J	69.9 J	108	156	114
CALCIUM, TOTAL	µg/L	208,000	150,000	147,000	160,000	254,000	145,000
CHLORIDE, TOTAL	mg/L	5.3	2.8	10.0	25.6	19.9	3.3
FLUORIDE, TOTAL	mg/L	ND	ND	ND	ND	ND	ND
SULFATE, TOTAL	mg/L	72.4	38.3	37.2	55.4	231	44.8
TOTAL DISSOLVED SOLIDS	mg/L	692	471	434	485	568 J	1,100

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 19, 2023

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

RE: Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on January 06, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

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

Sincerely,

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

Enclosures

cc: Lisa Meyer, Ameren
Grant Morey, WSP Golder
Ann Muehlfarth, WSP Golder
Eric Schneider, WSP Golder

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CERTIFICATIONS

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 22-031-0
Illinois Certification #: 2000302021-3
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 #: T104704407-21-15
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 LEC LCL1
Pace Project No.: 60419332

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60419332001	**L-MW-26**	Water	01/05/23 12:39	01/06/23 03:25
60419332002	**L-TMW-2**	Water	01/05/23 11:18	01/06/23 03:25
60419332003	**L-LCL1-FB-1**	Water	01/05/23 11:38	01/06/23 03:25
60419332004	**L-LCL1-DUP-1**	Water	01/05/23 08:00	01/06/23 03:25

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SAMPLE ANALYTE COUNT

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60419332001	**L-MW-26**	EPA 200.7	ALH	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	RKA	2	PASI-K
60419332002	**L-TMW-2**	EPA 200.7	ALH	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	RKA	2	PASI-K
60419332003	**L-LCL1-FB-1**	EPA 200.7	ALH	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	RKA	2	PASI-K
60419332004	**L-LCL1-DUP-1**	EPA 200.7	ALH	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	RKA	2	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Sample: L-MW-26 **Lab ID: 60419332001** Collected: 01/05/23 12:39 Received: 01/06/23 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**143000**	ug/L	200	26.5	1	01/09/23 10:58	01/10/23 13:53	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**520**	mg/L	10.0	10.0	1		01/12/23 10:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**8.7**	mg/L	1.0	0.53	1		01/09/23 12:12	16887-00-6	
Sulfate	**26.8**	mg/L	5.0	2.8	5		01/09/23 12:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Sample: L-TMW-2 **Lab ID: 60419332002** Collected: 01/05/23 11:18 Received: 01/06/23 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**288000**	ug/L	200	26.5	1	01/09/23 10:58	01/10/23 13:55	7440-70-2	M1
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**1340**	mg/L	13.3	13.3	1		01/12/23 10:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**32.9**	mg/L	2.0	1.1	2		01/09/23 12:39	16887-00-6	
Sulfate	**390**	mg/L	20.0	11.0	20		01/09/23 13:32	14808-79-8	M1,R1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Sample: L-LCL1-FB-1 **Lab ID: 60419332003** Collected: 01/05/23 11:38 Received: 01/06/23 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**<26.5**	ug/L	200	26.5	1	01/09/23 10:58	01/10/23 14:01	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		01/12/23 10:14		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		01/09/23 14:54	16887-00-6	
Sulfate	**<0.55**	mg/L	1.0	0.55	1		01/09/23 14:54	14808-79-8	

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Sample: L-LCL1-DUP-1 **Lab ID: 60419332004** Collected: 01/05/23 08:00 Received: 01/06/23 03:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**28300**	ug/L	200	26.5	1	01/09/23 10:58	01/10/23 14:10	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**184**	mg/L	5.0	5.0	1		01/12/23 10:15		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.7**	mg/L	1.0	0.53	1		01/10/23 10:14	16887-00-6	
Sulfate	**12.2**	mg/L	1.0	0.55	1		01/10/23 10:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

QC Batch: 826357
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: 60419332001, 60419332002, 60419332003, 60419332004

METHOD BLANK: 3282766 Matrix: Water
Associated Lab Samples: 60419332001, 60419332002, 60419332003, 60419332004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Calcium	ug/L	<26.5	200	26.5	01/10/23 13:17	

LABORATORY CONTROL SAMPLE: 3282767

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	10000	9750	98	85-115	

MATRIX SPIKE SAMPLE: 3282768

Parameter	Units	60419277002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	76600	10000	84700	81	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3282769 3282770

Parameter	Units	60419332002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	288000	10000	10000	293000	299000	45	110	70-130	2	20	M1

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

QC Batch: 827026
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60419332001, 60419332002, 60419332003, 60419332004

METHOD BLANK: 3284904 Matrix: Water
Associated Lab Samples: 60419332001, 60419332002, 60419332003, 60419332004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/12/23 10:14	

LABORATORY CONTROL SAMPLE: 3284905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	994	99	80-120	

SAMPLE DUPLICATE: 3284906

Parameter	Units	60419332002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1340	1310	3	10	

SAMPLE DUPLICATE: 3284907

Parameter	Units	60419381002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	892	892	0	10	

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

QC Batch: 826287 | 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: 60419332001, 60419332002, 60419332003, 60419332004

METHOD BLANK: 3282394 Matrix: Water
Associated Lab Samples: 60419332001, 60419332002, 60419332003, 60419332004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	01/09/23 11:18	
Sulfate	mg/L	<0.55	1.0	0.55	01/09/23 11:18	

METHOD BLANK: 3284274 Matrix: Water
Associated Lab Samples: 60419332001, 60419332002, 60419332003, 60419332004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	01/10/23 08:51	
Sulfate	mg/L	<0.55	1.0	0.55	01/10/23 08:51	

LABORATORY CONTROL SAMPLE: 3282395

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

LABORATORY CONTROL SAMPLE: 3284275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	90	90-110	
Sulfate	mg/L	5	4.7	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3282396 3282397

Parameter	Units	60419332002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	32.9	10	10	43.5	43.5	106	106	80-120	0	15	E
Sulfate	mg/L	390	100	100	633	518	243	128	80-120	20	15	E,M1, R1

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3282399 3282400

Parameter	Units	60419333003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	20.0	5	5	25.8	25.9	116	118	80-120	0	15	E
Sulfate	mg/L	550	5	5	553	551	70	30	80-120	0	15	E,M1

SAMPLE DUPLICATE: 3282398

Parameter	Units	60419332002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	32.9	32.8	0	15	
Sulfate	mg/L	390	372	5	15	

SAMPLE DUPLICATE: 3282401

Parameter	Units	60419333003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	20.0	20.1	0	15	E
Sulfate	mg/L	550	550	0	15	E

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

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

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LEC LCL1
Pace Project No.: 60419332

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60419332001	**L-MW-26**	EPA 200.7	826357	EPA 200.7	826466
60419332002	**L-TMW-2**	EPA 200.7	826357	EPA 200.7	826466
60419332003	**L-LCL1-FB-1**	EPA 200.7	826357	EPA 200.7	826466
60419332004	**L-LCL1-DUP-1**	EPA 200.7	826357	EPA 200.7	826466
60419332001	**L-MW-26**	SM 2540C	827026		
60419332002	**L-TMW-2**	SM 2540C	827026		
60419332003	**L-LCL1-FB-1**	SM 2540C	827026		
60419332004	**L-LCL1-DUP-1**	SM 2540C	827026		
60419332001	**L-MW-26**	EPA 300.0	826287		
60419332002	**L-TMW-2**	EPA 300.0	826287		
60419332003	**L-LCL1-FB-1**	EPA 300.0	826287		
60419332004	**L-LCL1-DUP-1**	EPA 300.0	826287		

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

WO# : 60419332

60419332

Client Name: GOLDER AS. USA

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

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

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

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

Thermometer Used: T-296 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.8 **Corr. Factor** -0.1 **Corrected** 1.7

Date and initials of person examining contents: VF 01/06

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical
www.pacelabs.com

Page: 1 of 1

Section A Required Client Information:

Company:	Golder Associates USA Inc.
Address:	701 Emerson Rd, Ste 250
	Creve Coeur, MO 63141
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Grant Morey
Purchase Order No.:	
Project Name:	Ameren
Project Number:	GL153140604

Section C Invoice Information:

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

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-MW-26	WT	G			1/5/23	1239		2	X		X						N	X	X	F	X	X		60419332
2	L-TMW-2	WT	G			1/5/23	1118		2	X		X						N	X	X		X	X		
3	L-LCLI-FB-1	WT	G			1/5/23	1138		2	X		X						N	X	X		X	X		
4	L-LCLI-MS-1	WT	G			1/5/23	1118		2	X		X						N	X	X		X	X		Collected @ TMW-2
5	L-LCLI-MSD-1	WT	G			1/5/23	1118		2	X		X						N	X	X		X	X		Collected @ TMW-2
6	L-LCLI-DUP-1	WT	G			1/5/23	—		2	X		X						N	X	X		X	X		
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			
	Payton Spohn / WSP	1/5/23	1418		01/06	0325	1.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Payton Spohn

SIGNATURE of SAMPLER: Payton Spohn DATE Signed (MM/DD/YY): 01/5/23

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.

Client: GOLDER AS. USA Profile # 9285

Site: GL1531406604 Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1																																
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: 60419332

MEMORANDUM

DATE January 23, 2023 **Project No.** 153140604.0001

TO Project File
WSP USA Inc.

CC Amanda Derhake, Jeff Ingram

FROM Rahel Pommerenke **EMAIL rahel.pommerenke@wsp.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – VERIFICATION SAMPLING - DATA PACKAGE 60419332

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

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

WSP USA Inc.
701 Emerson Road, Suite 250,
Creve Coeur, Missouri, USA 63141
T: +1 314 984-8800 F: +1 314 984-8770

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: WSP USA Inc.
Project Manager: J. Ingram
Project Name: Ameren LEC - LCL1 VS
Project Number: 153140604.0001
Reviewer: R.Pommerenke
Validation Date: 1/23/2023

Laboratory: Pace Analytical Services
SDG #: 60419332
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names L-MW-26, L-TMW-2, L-LCL1-FB-1, L-LCL1-DUP-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☒	☐	☐	01/05/2023
b) Sampling team indicated?	☒	☐	☐	PCS
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	See notes.
g) Field parameters collected (note types)?	☒	☐	☐	pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☐	☒	☐	L-LCL1-FB-1 @ L-TMW-2
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	L-LCL1-DUP-1 @ L-MW-26
b) Were field dup. precision criteria met (note RPD)?	☐	☒	☐	See notes.
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	

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

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

Comments/Notes:

Dilutions:

Sulfate and Chloride analyzed at a dilution. No qualification necessary.

Duplicates:

L-LCL1-DUP-1 @ L-MW-26: RPD for Calcium (133.9%), Total Dissolved Solids (95.5%), Chloride (105.3%), and Sulfate (74.9%) exceeds max RPD (20%): qualified as estimate.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

MS/MSD:

3282769/3282770: MS % recovery low for Calcium. Only one QC indicator out of control limits: no qualification necessary.
Associated with L-TMW-2.

3282396/3282397: MS/MSD % recovery high for Sulfate. RPD for Sulfate (20%) exceeds max RPD (15%).
Associated with L-TMW-2.

3282399/3282400: MS/MSD % recovery for Sulfate low. Performed on unrelated sample: no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-LCL1-DUP-1	Calcium	28300	J	Dup RPD exceeds control limits.
"	Total Dissolved Solids	184	J	"
"	Chloride	2.7	J	"
"	Sulfate	12.2	J	"
L-MW-26	Calcium	143000	J	"
"	Total Dissolved Solids	520	J	"
"	Chloride	8.7	J	"
"	Sulfate	26.8	J	"
L-TMW-2	Sulfate	390	J	MS/MSD % recovery and RPD outside control limits.

Signature: _____ Date: 1/23/2023

Pace Analytical Services, LLC
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January 29, 2024

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

RE: Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between May 13, 2023 and May 20, 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 LCL1-Revised Report
Pace Project No.: 60429091

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 LCL1-Revised Report
Pace Project No.: 60429091

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60429091001	**L-TMW-1**	Water	05/16/23 13:24	05/18/23 05:13
60429091002	**L-TMW-2**	Water	05/16/23 11:24	05/18/23 05:13
60429091003	**L-TMW-3**	Water	05/16/23 15:37	05/18/23 05:13
60429091004	**L-UWL-DUP-1**	Water	05/16/23 00:00	05/18/23 05:13
60429091005	**L-UWL-FB-1**	Water	05/16/23 11:39	05/18/23 05:13
60429091006	**L-UWL-MS-1**	Water	05/16/23 15:37	05/18/23 05:13
60429091007	**L-UWL-MSD-1**	Water	05/16/23 15:37	05/18/23 05:13
60429091008	**L-MW-26**	Water	05/18/23 12:35	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

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SAMPLE ANALYTE COUNT

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60429091001	**L-TMW-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
60429091002	**L-TMW-2**	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
60429091003	**L-TMW-3**	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
60429091004	**L-UWL-DUP-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
60429091005	**L-UWL-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
60429091008	**L-MW-26**	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
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 LCL1-Revised Report
Pace Project No.: 60429091

Sample: L-TMW-1 **Lab ID: 60429091001** Collected: 05/16/23 13:24 Received: 05/18/23 05:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**103**	ug/L	100	6.4	1	05/24/23 12:44	06/06/23 12:49	7440-42-8	
Calcium	**163000**	ug/L	200	26.9	1	05/24/23 12:44	06/06/23 12:49	7440-70-2	
Iron	**29.4J**	ug/L	50.0	9.1	1	05/24/23 12:44	06/06/23 12:49	7439-89-6	
Magnesium	**38500**	ug/L	50.0	20.1	1	05/24/23 12:44	06/06/23 12:49	7439-95-4	
Manganese	**37.0**	ug/L	5.0	0.39	1	05/24/23 12:44	06/06/23 12:49	7439-96-5	
Potassium	**4440**	ug/L	500	69.7	1	05/24/23 12:44	06/06/23 12:49	7440-09-7	
Sodium	**9680**	ug/L	500	115	1	05/24/23 12:44	06/06/23 12:49	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**510**	mg/L	20.0	10.5	1		05/23/23 11:54		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**771**	mg/L	10.0	10.0	1		05/23/23 10:31		
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		06/05/23 20:51	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.12	1		06/05/23 20:51	16984-48-8	
Sulfate	**50.5**	mg/L	20.0	11.0	20		06/05/23 21:04	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

Sample: L-TMW-2 **Lab ID: 60429091002** Collected: 05/16/23 11:24 Received: 05/18/23 05:13 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	**109**	ug/L	100	6.4	1	05/24/23 12:44	06/06/23 12:51	7440-42-8	
Calcium	**204000**	ug/L	200	26.9	1	05/24/23 12:44	06/06/23 12:51	7440-70-2	
Iron	**297**	ug/L	50.0	9.1	1	05/24/23 12:44	06/06/23 12:51	7439-89-6	
Magnesium	**54700**	ug/L	50.0	20.1	1	05/24/23 12:44	06/06/23 12:51	7439-95-4	
Manganese	**2970**	ug/L	5.0	0.39	1	05/24/23 12:44	06/06/23 12:51	7439-96-5	
Potassium	**6870**	ug/L	500	69.7	1	05/24/23 12:44	06/06/23 12:51	7440-09-7	
Sodium	**11700**	ug/L	500	115	1	05/24/23 12:44	06/06/23 12:51	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**641**	mg/L	20.0	10.5	1		05/23/23 12:01		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**981**	mg/L	13.3	13.3	1		05/23/23 10:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**7.1**	mg/L	1.0	0.53	1		06/05/23 21:17	16887-00-6	
Fluoride	**0.17J**	mg/L	0.20	0.12	1		06/05/23 21:17	16984-48-8	
Sulfate	**123**	mg/L	20.0	11.0	20		06/05/23 21:31	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

Sample: L-TMW-3 **Lab ID: 60429091003** Collected: 05/16/23 15:37 Received: 05/18/23 05:13 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	**94.3J**	ug/L	100	6.4	1	05/24/23 12:44	06/06/23 12:53	7440-42-8	
Calcium	**122000**	ug/L	200	26.9	1	05/24/23 12:44	06/06/23 12:53	7440-70-2	M1
Iron	**217**	ug/L	50.0	9.1	1	05/24/23 12:44	06/06/23 12:53	7439-89-6	
Magnesium	**24000**	ug/L	50.0	20.1	1	05/24/23 12:44	06/06/23 12:53	7439-95-4	
Manganese	**113**	ug/L	5.0	0.39	1	05/24/23 12:44	06/06/23 12:53	7439-96-5	
Potassium	**5330**	ug/L	500	69.7	1	05/24/23 12:44	06/06/23 12:53	7440-09-7	
Sodium	**6250**	ug/L	500	115	1	05/24/23 12:44	06/06/23 12:53	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**391**	mg/L	20.0	10.5	1		05/23/23 12:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**512**	mg/L	10.0	10.0	1		05/23/23 10:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**1.5**	mg/L	1.0	0.53	1		06/05/23 23:04	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.12	1		06/05/23 23:04	16984-48-8	
Sulfate	**27.2**	mg/L	20.0	11.0	20		06/05/23 21:44	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

Sample: L-UWL-DUP-1 **Lab ID: 60429091004** Collected: 05/16/23 00:00 Received: 05/18/23 05:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**103**	ug/L	100	6.4	1	05/24/23 12:44	06/06/23 12:59	7440-42-8	
Calcium	**160000**	ug/L	200	26.9	1	05/24/23 12:44	06/06/23 12:59	7440-70-2	
Iron	**25.4J**	ug/L	50.0	9.1	1	05/24/23 12:44	06/06/23 12:59	7439-89-6	
Magnesium	**38100**	ug/L	50.0	20.1	1	05/24/23 12:44	06/06/23 12:59	7439-95-4	
Manganese	**44.9**	ug/L	5.0	0.39	1	05/24/23 12:44	06/06/23 12:59	7439-96-5	
Potassium	**4360**	ug/L	500	69.7	1	05/24/23 12:44	06/06/23 12:59	7440-09-7	
Sodium	**9530**	ug/L	500	115	1	05/24/23 12:44	06/06/23 12:59	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**507**	mg/L	20.0	10.5	1		05/23/23 12:34		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**995**	mg/L	10.0	10.0	1		05/23/23 10:32		
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		06/05/23 23:58	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.12	1		06/05/23 23:58	16984-48-8	
Sulfate	**51.3**	mg/L	20.0	11.0	20		06/06/23 00:11	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

Sample: L-UWL-FB-1 **Lab ID: 60429091005** Collected: 05/16/23 11:39 Received: 05/18/23 05:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**<6.4**	ug/L	100	6.4	1	05/24/23 12:44	06/06/23 13:01	7440-42-8	
Calcium	**32.2J**	ug/L	200	26.9	1	05/24/23 12:44	06/06/23 13:01	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	05/24/23 12:44	06/06/23 13:01	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	05/24/23 12:44	06/06/23 13:01	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	05/24/23 12:44	06/06/23 13:01	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	05/24/23 12:44	06/06/23 13:01	7440-09-7	
Sodium	**<115**	ug/L	500	115	1	05/24/23 12:44	06/06/23 13:01	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		05/23/23 12:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**8.5**	mg/L	5.0	5.0	1		05/23/23 10:32		
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		06/06/23 00:25	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/06/23 00:25	16984-48-8	
Sulfate	**<0.55**	mg/L	1.0	0.55	1		06/06/23 00:25	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

Sample: L-MW-26 **Lab ID: 60429091008** Collected: 05/18/23 12:35 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	**45.6J**	ug/L	100	6.4	1	06/13/23 13:43	06/19/23 08:54	7440-42-8	
Calcium	**140000**	ug/L	200	26.9	1	06/13/23 13:43	06/19/23 08:54	7440-70-2	
Iron	**13.5J**	ug/L	50.0	9.1	1	06/13/23 13:43	06/19/23 08:54	7439-89-6	B
Magnesium	**26000**	ug/L	50.0	20.1	1	06/13/23 13:43	06/19/23 08:54	7439-95-4	
Manganese	**11.4**	ug/L	5.0	0.39	1	06/13/23 13:43	06/19/23 08:54	7439-96-5	
Potassium	**3970**	ug/L	500	69.7	1	06/13/23 13:43	06/19/23 08:54	7440-09-7	
Sodium	**4910**	ug/L	500	115	1	06/13/23 13:43	06/19/23 08:54	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**435**	mg/L	20.0	10.5	1		05/24/23 13:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**549**	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	**14.2**	mg/L	1.0	0.53	1		06/13/23 13:16	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/23 13:16	16984-48-8	
Sulfate	**44.4**	mg/L	20.0	11.0	20		06/13/23 13:29	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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

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

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

QC Batch: 848866
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: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

METHOD BLANK: 3363075 Matrix: Water
Associated Lab Samples: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

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

LABORATORY CONTROL SAMPLE: 3363076

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	991	99	85-115	
Calcium	ug/L	10000	10700	107	85-115	
Iron	ug/L	10000	10500	105	85-115	
Magnesium	ug/L	10000	10500	105	85-115	
Manganese	ug/L	1000	1060	106	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Sodium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3363102 3363103

Parameter	Units	60429091003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	94.3J	1000	1000	1070	1070	97	98	70-130	1	20	
Calcium	ug/L	122000	10000	10000	128000	128000	65	61	70-130	0	20	M1
Iron	ug/L	217	10000	10000	10800	10600	106	103	70-130	2	20	
Magnesium	ug/L	24000	10000	10000	33600	33600	96	96	70-130	0	20	
Manganese	ug/L	113	1000	1000	1150	1120	104	101	70-130	3	20	
Potassium	ug/L	5330	10000	10000	15500	15600	102	103	70-130	0	20	
Sodium	ug/L	6250	10000	10000	16300	16400	101	102	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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: 60429091008

METHOD BLANK: 3374470 Matrix: Water
Associated Lab Samples: 60429091008

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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

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

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

QC Batch: 848548 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

METHOD BLANK: 3361946 Matrix: Water
Associated Lab Samples: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	05/23/23 10:09	

LABORATORY CONTROL SAMPLE: 3361947

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	506	101	90-110	

SAMPLE DUPLICATE: 3361948

Parameter	Units	60429159005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	284	290	2	10	

SAMPLE DUPLICATE: 3361949

Parameter	Units	60429091003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	391	393	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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: 60429091008

METHOD BLANK: 3362800 Matrix: Water
Associated Lab Samples: 60429091008

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

QC Batch: 848506
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

METHOD BLANK: 3361832 Matrix: Water
Associated Lab Samples: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/23/23 10:31	

LABORATORY CONTROL SAMPLE: 3361833

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1060	106	80-120	

SAMPLE DUPLICATE: 3361834

Parameter	Units	60429091003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	512	539	5	10	

SAMPLE DUPLICATE: 3361835

Parameter	Units	60428743005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	560	573	2	10	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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: 60429091008

METHOD BLANK: 3363629 Matrix: Water
Associated Lab Samples: 60429091008

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	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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

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

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 LCL1-Revised Report
Pace Project No.: 60429091

QC Batch: 850451
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: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

METHOD BLANK: 3368653 Matrix: Water
Associated Lab Samples: 60429091001, 60429091002, 60429091003, 60429091004, 60429091005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/05/23 15:44	
Fluoride	mg/L	<0.12	0.20	0.12	06/05/23 15:44	
Sulfate	mg/L	<0.55	1.0	0.55	06/05/23 15:44	

LABORATORY CONTROL SAMPLE: 3368654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368655 3368656

Parameter	Units	60429091003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.5	5	5	6.3	5.9	97	88	80-120	7	15	
Fluoride	mg/L	0.13J	2.5	2.5	2.8	2.5	105	96	80-120	8	15	
Sulfate	mg/L	27.2	100	100	125	124	97	96	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368658 3368659

Parameter	Units	60428743005 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	9.1	9.3	104	108	80-120	2	15	
Fluoride	mg/L	0.14J	2.5	2.5	2.7	2.8	103	107	80-120	3	15	
Sulfate	mg/L	16.6	100	100	114	114	98	98	80-120	0	15	

SAMPLE DUPLICATE: 3368657

Parameter	Units	60429091003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1.5	1.5	5	15	
Fluoride	mg/L	0.13J	<0.12		15	
Sulfate	mg/L	27.2	27.8	2	15	

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REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

SAMPLE DUPLICATE: 3368660

Parameter	Units	60428743005 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	3.9	3.9	0	15	
Fluoride	mg/L	0.14J	0.15J		15	
Sulfate	mg/L	16.6	16.6	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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: 60429091008

METHOD BLANK: 3372729 Matrix: Water
Associated Lab Samples: 60429091008

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

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60429091

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
60429091001	**L-TMW-1**	EPA 200.7	848866	EPA 200.7	848950
60429091002	**L-TMW-2**	EPA 200.7	848866	EPA 200.7	848950
60429091003	**L-TMW-3**	EPA 200.7	848866	EPA 200.7	848950
60429091004	**L-UWL-DUP-1**	EPA 200.7	848866	EPA 200.7	848950
60429091005	**L-UWL-FB-1**	EPA 200.7	848866	EPA 200.7	848950
60429091008	**L-MW-26**	EPA 200.7	852043	EPA 200.7	852106
60428743001	**L-BMW-1S**	SM 2320B	847594		
60428743002	**L-BMW-2S**	SM 2320B	847594		
60429091001	**L-TMW-1**	SM 2320B	848548		
60429091002	**L-TMW-2**	SM 2320B	848548		
60429091003	**L-TMW-3**	SM 2320B	848548		
60429091004	**L-UWL-DUP-1**	SM 2320B	848548		
60429091005	**L-UWL-FB-1**	SM 2320B	848548		
60429091008	**L-MW-26**	SM 2320B	848809		
60428743001	**L-BMW-1S**	SM 2540C	847756		
60428743002	**L-BMW-2S**	SM 2540C	847756		
60429091001	**L-TMW-1**	SM 2540C	848506		
60429091002	**L-TMW-2**	SM 2540C	848506		
60429091003	**L-TMW-3**	SM 2540C	848506		
60429091004	**L-UWL-DUP-1**	SM 2540C	848506		
60429091005	**L-UWL-FB-1**	SM 2540C	848506		
60429091008	**L-MW-26**	SM 2540C	849038		
60428743001	**L-BMW-1S**	EPA 300.0	849825		
60428743002	**L-BMW-2S**	EPA 300.0	849825		
60429091001	**L-TMW-1**	EPA 300.0	850451		
60429091002	**L-TMW-2**	EPA 300.0	850451		
60429091003	**L-TMW-3**	EPA 300.0	850451		
60429091004	**L-UWL-DUP-1**	EPA 300.0	850451		
60429091005	**L-UWL-FB-1**	EPA 300.0	850451		
60429091008	**L-MW-26**	EPA 300.0	851544		

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Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sa	WO# : 60429091
	Revision: 2	Effective Date: 01/12

60429091

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

Cooler Temperature (°C): **As-read** 18/2.1 **Corr. Factor** +0.2 **Corrected** 2.0/2.3

Temperature should be above freezing to 6°C 1.7/15.9 1.9/16.1

Date and initials of person examining contents: PV 5/18/17

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	Pour off 100mL from BP1U
Sufficient volume:	☐Yes ☐No ☐N/A	into a BP3Z for samples
Correct containers used:	☐Yes ☐No ☐N/A	L-TMW-1, L-TMW-2 and L-UWL DUP-1
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.
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: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	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 LCL1
Project Number:	COC #4

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.
																			N	N	N	N	N	N	N	N	N	N	N	N	
1	L-TMW-1	WT	G			5-16-23	1324		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		60429091
2	L-TMW-2	WT	G			"	1124		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3	L-TMW-3	WT	G			"	1537		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
4	L-MW-26	WT	G																												
5	L-BMW-1S	WT	G																												
6	L-BMW-2S	WT	G																												
7	L-UWL-DUP-1	WT	G			5-16-23	—		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
8	L-UWL-FB-1	WT	G			"	1139		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
9	L-UWL-MS-1	WT	G			"	1537		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	—		Collected @ L-TMW-3
10	L-UWL-MSD-1	WT	G			"	1537		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	—		Collected @ L-TMW-3
11		WT	G																												
12		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	5-17-23	1220	[signature]	5/18	0513
**- 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 (9/05/18)

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2-0	Y	Y	Y
2-3			
1-9			
16.1	N		

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/17/23

*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.

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 LCL1
Project Number:	COC #4

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	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	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.
																		Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N		60429091
1	L-TMW-1	WT	G																													
2	L-TMW-2	WT	G																													
3	L-TMW-3	WT	G																													
4	L-MW-26	WT	G																													
5	L-BMW-1S	WT	G			5-11-23	1322		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6	L-BMW-2S	WT	G			↓	1034		8	2	2	3		1					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7	L-UWL-DUP-1	WT	G																													
8	L-UWL-FB-1	WT	G																													
9	L-UWL-MS-1	WT	G																													
10	L-UWL-MSD-1	WT	G																													
11		WT	G																													
12		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 / WSP	5-12-23	1530		5/18	0513
**- 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				
Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2.0	Y	Y	Y
2.3			
1.9			
16.1	N	Y	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey
SIGNATURE of SAMPLER: Grant Morey
DATE Signed (MM/DD/YY): 05/12/23

*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.

~~H2~~ DO not log Ferrour/Ferric Iron
Do not log Sulfide.

Client: Rocksmith Geoeng

Profile # 1587-1

Site:

Notes BP1N = Radium / leave BP3Z blank / leave BP3C blank.

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	WT												1						1		1	2	1			1	1				1	
2	WT												1						1		1	2	1			1	1				1	
3	WT												3						3		3	2	3				3				3	
4																																
5																																
6																																
7	WT												1						1		1	2	1				1				1	
8	WT												1						1		1	2	1				1				1	
9	WT																					2										
10	WT																					2										
11																																
12																																

Container Codes

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

Work Order Number: 60429091

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sam	WO#: 60429091
	Revision: 2	Effective Date: 01/12/

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 ☑ Zip

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

Cooler Temperature (°C): **As-read** 16.6 **Corr. Factor** +0.2 **Corrected** 16.8 / 1.4

Temperature should be above freezing to 6°C 1.2

Date and initials of person examining contents: 05-20-2025 4

Chain of Custody present:	☑Yes ☐No ☐N/A	cooler with 16.8 temp
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	nad only Radium
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, 62021	☑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 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 LCL1
Project Number:	COC #4

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
	WP
	AR
	OT
	TS

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

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	60429091
1	L-TMW-1	WT	G																											
2	L-TMW-2	WT	G																											
3	L-TMW-3	WT	G																											
4	L-MW-26	WT	G			5-19-23	1235		6	1	2	3							✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		
5	L-BMW-1S	WT	G																											
6	L-BMW-2S	WT	G																											
7	L-UWL-DUP-1	WT	G																											
8	L-UWL-FB-1	WT	G																											
9	L-UWL-MS-1	WT	G																											
10	L-UWL-MSD-1	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	5-19-23	1600	[illegible]	5.20.23	0440	16.8	N	Y	Y
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl							1.4	Y	Y	Y
***Al, Cu, Ni, Ag, Zn + Hardness										
Radium 226/228 to Pace PA										

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Grant Morey					
SIGNATURE of SAMPLER:	[signature]	DATE Signed (MM/DD/YY): 05/19/23				

*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 # Append to 60429091

Site: Ameren LCCI COC #4

Notes 2 BP1N - SI RAD, AG2S - SI 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	WT																														
2	WT																														
3	WT																														
4	WT												1						1		1	2	1				1				1	
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: 60429091

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sam	WO#: 60429091
	Revision: 2	Effective Date: 01/12/

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 ☑ Zip

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

Cooler Temperature (°C): **As-read** 16.6 **Corr. Factor** +0.2 **Corrected** 16.8 / 1.4

Temperature should be above freezing to 6°C 1.2

Date and initials of person examining contents: 05-20-2025 4

Chain of Custody present:	☑Yes ☐No ☐N/A	cooler with 16.8 temp
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	nad only Radium
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, 62021	☑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

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 LCL1
Project Number:	COC #4

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
	WP
	AR
	OT
	TS

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

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-TMW-1	WT	G																											
2	L-TMW-2	WT	G																											
3	L-TMW-3	WT	G																											
4	L-MW-26	WT	G			5-19-23	1235		6	1	2	3							✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		60429091
5	L-BMW-1S	WT	G																											
6	L-BMW-2S	WT	G																											
7	L-UWL-DUP-1	WT	G																											
8	L-UWL-FB-1	WT	G																											
9	L-UWL-MS-1	WT	G																											
10	L-UWL-MSD-1	WT	G																											
11		WT	G																											
12		WT	G																											

Pace Project No./ Lab I.D.: 60429091

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	5-19-23	1600	[illegible]	5.20.23	0440	16.8	N	Y	Y
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl							1.4	Y	Y	Y
***Al, Cu, Ni, Ag, Zn + Hardness										
Radium 226/228 to Pace PA										

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Grant Morey				
SIGNATURE of SAMPLER:	[signature]				
DATE Signed (MM/DD/YY):	05/19/23				

*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 # Append to 60429091

Site: Ameren LCCI COC #4

Notes 2 BP1N - SI RAD, AG2S - SI 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	WT																														1
2	WT																														
3	WT																														
4	WT												1						1		1	2	1				1				1
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: 60429091

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 – LCL1 – Data Package 60429091**		

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren LCL1
Project Number: 23007
Reviewer: G. Morey
Validation Date: 1/30/2024

Laboratory: Pace Analytical
SDG #: 60429091
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-TMW-1, L-TMW-2, L-TMW-3, L-UWL-DUP-1, L-UWL-FB-1, L-UWL-MS-1, L-UWL-MSD-1, L-MW-26, 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 - 5/18/2023
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 data packet includes 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		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		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 sulfate in several samples, no qualification necessary. .

Method Blanks:

3357531: calcium (28.4J), iron (16.0J), manganese (1.9J). Associated with samples -001 and -002. 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):

3374470: calcium (46.0J), iron (19.9J), manganese (0.53J). Associated with sample -008. Iron result < RL, qualified as non-detect at RL.

Field Blank:

L-UWL-FB-1 @ L-TMW-2: calcium (32.2J) and TDS (8.5). No qualification necessary. results > RL and 10x blank.

Laboratory Control Samples:

3366406: LCS recovery low for fluoride, associated with samples -001 and -002. Results flagged with UJ.

Duplicates:

L-UWL-DUP-1 @ L-TMW-1: Field DUP RPD exceeds control limits for TDS (25%), results qualified as estimates.

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.

MS/MSD:

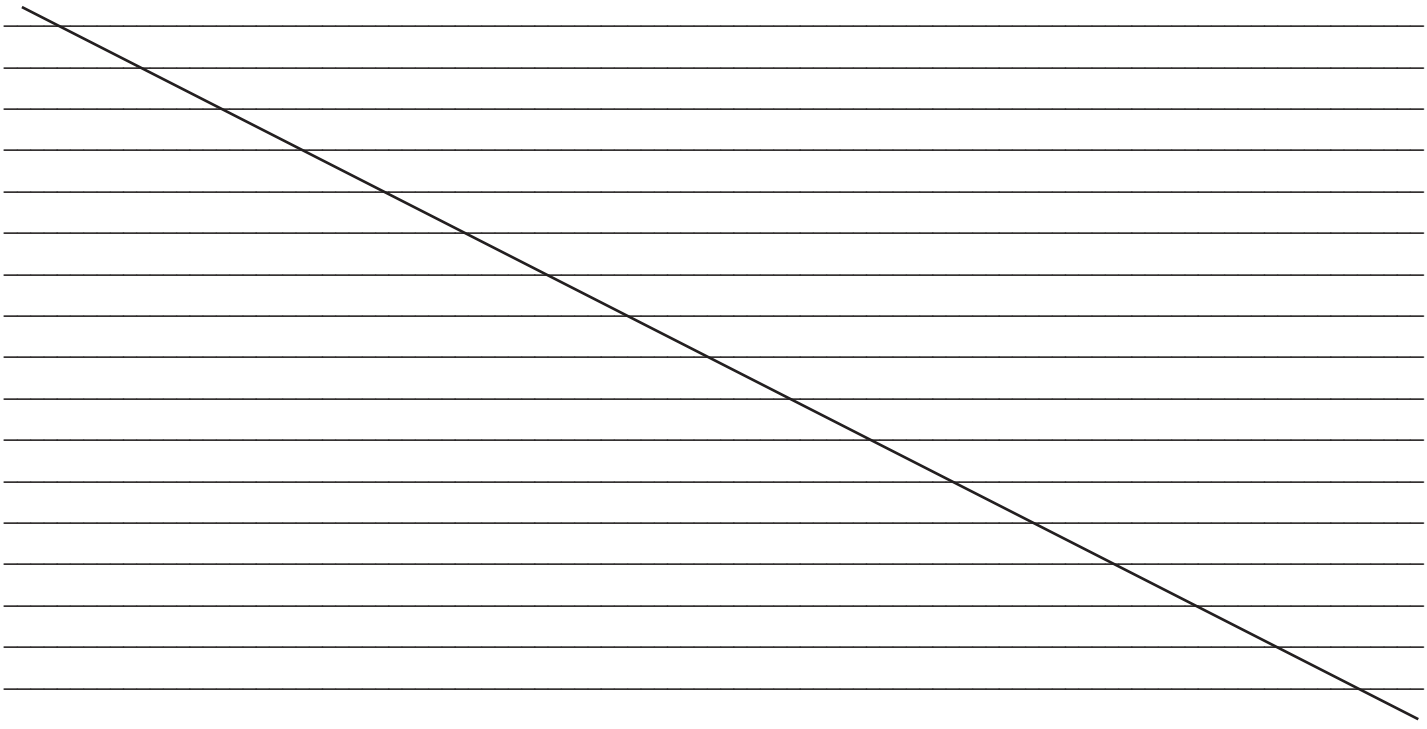
3357533/3357534: MS/MSD recoveries low for calcium and sodium. Associated with unrelated sample, no qualification necessary.

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

3363102/3363103: MS/MSD recoveries low for calcium. Associated with sample -003, result qualified as estimate.

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.



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-BMW-2S	Iron	50	U	Detected in method blank, result < RL
"	Manganese	5.0	U	"
L-MW-26	Iron	50	U	"
L-BMW-1S	Fluoride	0.12	UJ	LCS recovery low
L-BMW-2S	Fluoride	0.12	UJ	"
L-TMW-1	TDS	771	J	Field duplicate RPD exceeds control limits
L-UWL-DUP-1	"	995	J	"
L-TMW-3	Calcium	122,000	J-	MS/MSD recovery 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
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(913)599-5665

August 03, 2023

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

RE: Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on July 15, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

Note: Per client request, Chloride added to MW-6.

REV-1, 8/3/23: Chloride missing from report for MW-6. Included in revision.

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-VERIFICATION, LCL1
Pace Project No.: 60433247

Pace Analytical Services Kansas

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

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SAMPLE SUMMARY

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60433247001	**L-TMW-1**	Water	07/13/23 12:54	07/15/23 05:15
60433247002	**L-LCL1-DUP-1**	Water	07/13/23 00:00	07/15/23 05:15
60433247003	**L-LCL1-FB-1**	Water	07/13/23 13:00	07/15/23 05:15
60433247004	**L-MW-26**	Water	07/13/23 14:15	07/15/23 05:15

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SAMPLE ANALYTE COUNT

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60433247001	**L-TMW-1**	SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60433247002	**L-LCL1-DUP-1**	SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60433247003	**L-LCL1-FB-1**	SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	1	PASI-K
60433247004	**L-MW-26**	SM 2540C	BDH1	1	PASI-K
		EPA 300.0	CRN2	2	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

Sample: L-TMW-1 **Lab ID: 60433247001** Collected: 07/13/23 12:54 Received: 07/15/23 05:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**602**	mg/L	10.0	10.0	1		07/20/23 10:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**32.3**	mg/L	10.0	5.5	10		07/27/23 11:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

Sample: L-LCL1-DUP-1 **Lab ID: 60433247002** Collected: 07/13/23 00:00 Received: 07/15/23 05:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**604**	mg/L	10.0	10.0	1		07/20/23 10:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**37.1**	mg/L	5.0	2.8	5		07/31/23 10:29	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

Sample: L-LCL1-FB-1 **Lab ID: 60433247003** Collected: 07/13/23 13:00 Received: 07/15/23 05:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**15.5**	mg/L	5.0	5.0	1		07/20/23 10:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**<0.55**	mg/L	1.0	0.55	1		07/24/23 13:10	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

Sample: L-MW-26 **Lab ID: 60433247004** Collected: 07/13/23 14:15 Received: 07/15/23 05:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**533**	mg/L	10.0	10.0	1		07/20/23 10:02		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**11.1**	mg/L	1.0	0.53	1		07/27/23 13:39	16887-00-6	
Sulfate	**34.1**	mg/L	5.0	2.8	5		07/31/23 10:43	14808-79-8	M1,R1

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QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

QC Batch: 857202
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60433247001, 60433247002, 60433247003, 60433247004

METHOD BLANK: 3394433 Matrix: Water
Associated Lab Samples: 60433247001, 60433247002, 60433247003, 60433247004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/20/23 10:01	

LABORATORY CONTROL SAMPLE: 3394434

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

SAMPLE DUPLICATE: 3394435

Parameter	Units	60433247004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	533	541	1	10	

SAMPLE DUPLICATE: 3394436

Parameter	Units	60433254003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	475	473	0	10	

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QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

QC Batch: 857357
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: 60433247001

METHOD BLANK: 3395109 Matrix: Water
Associated Lab Samples: 60433247001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.55	1.0	0.55	07/21/23 09:36	

LABORATORY CONTROL SAMPLE: 3395110

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3395111 3395112

Parameter	Units	60433204001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	839	500	500	1770	1830	186	199	80-120	4	15	M1

SAMPLE DUPLICATE: 3395113

Parameter	Units	60433204001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	839	863	3	15	

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QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

QC Batch: 857359
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: 60433247002, 60433247003, 60433247004

METHOD BLANK: 3395115 Matrix: Water
Associated Lab Samples: 60433247002, 60433247003, 60433247004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	07/24/23 09:18	
Sulfate	mg/L	<0.55	1.0	0.55	07/24/23 09:18	

LABORATORY CONTROL SAMPLE: 3395116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3395117 3395118

Parameter	Units	60433247004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.1	5	5	16.1	15.5	100	87	80-120	4	15	
Sulfate	mg/L	34.1	25	25	57.7	69.4	94	141	80-120	18	15	M1,R1

SAMPLE DUPLICATE: 3395119

Parameter	Units	60433247004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	11.1	11.1	0	15	
Sulfate	mg/L	34.1	31.2	9	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60433247

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

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-VERIFICATION, LCL1
Pace Project No.: 60433247

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60433247001	**L-TMW-1**	SM 2540C	857202		
60433247002	**L-LCL1-DUP-1**	SM 2540C	857202		
60433247003	**L-LCL1-FB-1**	SM 2540C	857202		
60433247004	**L-MW-26**	SM 2540C	857202		
60433247001	**L-TMW-1**	EPA 300.0	857357		
60433247002	**L-LCL1-DUP-1**	EPA 300.0	857359		
60433247003	**L-LCL1-FB-1**	EPA 300.0	857359		
60433247004	**L-MW-26**	EPA 300.0	857359		

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Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sam	WO#: 60433247
	Revision: 2	Effective Date: 01/12/

60433247

Client Name: Rocksmith

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

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

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

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

Thermometer Used: T-209 **Type of Ice:** (Wet) Blue None

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

Date and initials of person examining contents: BC 7/15

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: LT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) **LOT#:** 67187	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☑No ☐N/A	
Samples from USDA Regulated Area: State:	☐Yes ☑No ☐N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☑No ☐N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Page 1 of 1

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffery Ingram, Grant Morey
Purchase Order No.:	COC #1
Project Name:	Ameren - Verification Sampling
Project Number:	COC#1 LCL1

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15856, line 1

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	TDS	Sulfate	Chloride	Boron	TOX	Calcium					Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N	N	N	N	N	N	N	60433247
1	L-TMW-1	WT	G			7-13-23	1254		1	1									✓	✓									
2	L-LCL1-DUP-1	WT	G			1	—		1	1									✓	✓									
3	L-LCL1-FB-1	WT	G				1300		1	1									✓	✓									
4	L-MW-26	WT	G				1415		1	1									✓	✓									
5	L-LCL1-MS-1	WT	G				1415		1	1									✓	✓	✓								Collected @ L-MW-26
6	L-LCL1-MSD-1	WT	G			1	1415		1	1									✓	✓									11
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)
	Grant Morey/Rocksmith	7-14-23	1400	Pace	7/15	0515	1.2	Y	Y	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: Grant Morey

DATE Signed (MM/DD/YY): 07/14/23

*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: Rocksmith

Profile # 15856 Line1

Site: Ameren LCLI

Notes Sample 4 Logas RQS

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1	WT																			1												
2	SL																			1												
3	WT																			1												
4	SL																			3												
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: 6043324 7

Memorandum

August 15, 2023

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 – LCL1 Verification – Data Package 60433247**		

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 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 LCL1 Verification
Project Number: 23007
Reviewer: G. Morey
Validation Date: 8/15/2023

Laboratory: Pace Analytical
SDG #: 60433247
Analytical Method (type and no.): EPA 300.0 (Chloride, Sulfate); SM 2540 (TDS)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names L-TMW-1, L-LCL1-DUP-1, L-LCL1-FB-1, L-MW-26

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			7/13/2023
b) Sampling team indicated?	x			GTM
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	No lab narrative.

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☒	☐	☐	L-LCL1-FB-1 @ L-TMW-1
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	L-LCL1-DUP-1 @ L-TMW-1
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	Sulfate (13.8%), TDS (0.3%)
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	

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

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

Comments/Notes:

Field Blanks:

L-LCL1-FB-1 @ L-TMW-1: TDS (15.5). Results > 10x blank, no qualification necessary.

MS/MSD:

3395111/3395112: MS/MSD recoveries exceed control limits, associated with unrelated sample, no qualification necessary.

3395117/3395118: MSD recovery and RPD exceeds control limits for Sulfate, associated with sample -004, result qualified as estimate.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-MW-26	Sulfate	34.1	J	MSD recovery high, RPD exceeds control limits

Signature: Grant Morey Date: 08/15/23

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

August 15, 2023

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

RE: Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on August 02, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

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

Sincerely,

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

Enclosures

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

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CERTIFICATIONS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

Pace Analytical Services Kansas

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

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SAMPLE SUMMARY

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60434367001	**L-TMW-2**	Water	08/01/23 11:20	08/02/23 05:13

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60434367001	**L-TMW-2**	SM 2540C	BDH1	1	PASI-K
		EPA 300.0	RKA	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

Sample: L-TMW-2 **Lab ID: 60434367001** Collected: 08/01/23 11:20 Received: 08/02/23 05:13 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**1100**	mg/L	13.3	13.3	1		08/04/23 09:37		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Sulfate	**257**	mg/L	20.0	11.0	20		08/04/23 19:02	14808-79-8	

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QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

QC Batch: 859217
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60434367001

METHOD BLANK: 3402514 Matrix: Water
Associated Lab Samples: 60434367001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/04/23 09:35	

LABORATORY CONTROL SAMPLE: 3402515

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

SAMPLE DUPLICATE: 3402516

Parameter	Units	60434305001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1330	1350	1	10	

SAMPLE DUPLICATE: 3402517

Parameter	Units	60434553002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1090	1090	0	10	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

QC Batch: 858974
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: 60434367001

METHOD BLANK: 3401415 Matrix: Water
Associated Lab Samples: 60434367001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.55	1.0	0.55	08/04/23 09:16	

METHOD BLANK: 3404838 Matrix: Water
Associated Lab Samples: 60434367001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.55	1.0	0.55	08/08/23 09:18	

METHOD BLANK: 3404876 Matrix: Water
Associated Lab Samples: 60434367001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.55	1.0	0.55	08/07/23 18:51	

LABORATORY CONTROL SAMPLE: 3401416

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.5	110	90-110	L1

LABORATORY CONTROL SAMPLE: 3404839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.8	97	90-110	

LABORATORY CONTROL SAMPLE: 3404877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	102	90-110	

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QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3401417 3401418

Parameter	Units	60434461001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	3170	1000	1000	3920	4040	75	87	80-120	3	15	E,M0

SAMPLE DUPLICATE: 3401421

Parameter	Units	60434461001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	3170	2960	7	15	

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

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QUALIFIERS

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

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

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN-VERIFICATION, LCL1
Pace Project No.: 60434367

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60434367001	**L-TMW-2**	SM 2540C	859217		
60434367001	**L-TMW-2**	EPA 300.0	858974		

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Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sa	WO# : 60434367
	Revision: 2	Effective Date: 01/12

60434367

Client Name: Rocksmith

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

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

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

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

Thermometer Used: T-291 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.3 **Corr. Factor** +0.2 **Corrected** 0.5

Date and initials of person examining contents: BC 8/2

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: LT	☐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#:**	☐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

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

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffery Ingram, Grant Morey
Purchase Order No.:	COC #1
Project Name:	Ameren - Verification Sampling, LCL1
Project Number:	COC#1

Section C Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15856, line 1

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TDS	Sulfate	Chloride	Boron	TOX	Calcium						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Requested Analysis Filtered (Y/N)	N	N	N	N	N	N	N	N	N	N		
1	L-TMW-2	WT	G			8-1-23	1120		1	1									✓	✓								60434367
2		WT	G																									
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			
	Grant Morey / Rocksmith	8-1-23	1600	BZ Tue	8/2	0513	0.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: Grant Morey

DATE Signed (MM/DD/YY): 08/01/23

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.

Client: Rocksmith

Profile # 15856 Lic1

Site: Ameren-Verification Sampling LCLI

Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1	WT																			1												
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: 60434367

Memorandum

August 15, 2023

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 – LCL1 Verification – Data Package 60434367**		

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

- None.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren LCL1 Verification
Project Number: 23007
Reviewer: G. Morey
Validation Date: 8/15/2023

Laboratory: Pace Analytical
SDG #: 60434367
Analytical Method (type and no.): EPA 300.0 (Sulfate); SM 2540C (TDS)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names L-TMW-2

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			8/1/2023
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		No field QC collected, additional sample
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	No lab narrative.

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☐	☐	☒	No field blank collected.
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

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

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

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

Comments/Notes:

MS/MSD:

3401417/3401418: MS recovery low for Sulfate, associated with unrelated sample, no qualification necessary.

No qualifications necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 08/15/23

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 LCL1-Revised Report
Pace Project No.: 60442423

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on November 18, 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 LCL1-Revised Report
Pace Project No.: 60442423

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 LCL1-Revised Report
Pace Project No.: 60442423

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60442423001	**L-TMW-1**	Water	11/17/23 08:42	11/18/23 04:55
60442423002	**L-TMW-2**	Water	11/16/23 14:56	11/18/23 04:55
60442423003	**L-TMW-3**	Water	11/17/23 12:25	11/18/23 04:55
60442423004	**L-UWL-DUP-1**	Water	11/16/23 08:00	11/18/23 04:55
60442423005	**L-UWL-FB-1**	Water	11/17/23 08:40	11/18/23 04:55
60442423006	**L-UWL-MS-1**	Water	11/17/23 12:25	11/18/23 04:55
60442423007	**L-UWL-MSD-1**	Water	11/17/23 12:25	11/18/23 04:55
60442419009	**L-MW-26**	Water	11/17/23 11:27	11/18/23 04:55
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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60442423001	**L-TMW-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
60442423002	**L-TMW-2**	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
60442423003	**L-TMW-3**	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
60442423004	**L-UWL-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
60442423005	**L-UWL-FB-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
60442419009	**L-MW-26**	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
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

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

Date: January 29, 2024

1e: 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.

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 LCL1-Revised Report
Pace Project No.: 60442423

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

General Information:
8 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 LCL1-Revised Report
Pace Project No.: 60442423

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

General Information:
8 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 LCL1-Revised Report
Pace Project No.: 60442423

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

General Information:
8 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-UWL-FB-1 (Lab ID: 60442423005)

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: 878919

1e: 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-MW-26 (Lab ID: 60442419009)
  - Total Dissolved Solids
- LCS (Lab ID: 3481070)
  - Total Dissolved Solids

QC Batch: 878920

1e: See case narrative
- BLANK (Lab ID: 3481071)
  - Total Dissolved Solids
- L-TMW-1 (Lab ID: 60442423001)
  - Total Dissolved Solids

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PROJECT NARRATIVE

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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

Analyte Comments:

QC Batch: 878920

1e: See case narrative

- L-TMW-2 (Lab ID: 60442423002)
  - Total Dissolved Solids
- L-TMW-3 (Lab ID: 60442423003)
  - Total Dissolved Solids
- L-UWL-DUP-1 (Lab ID: 60442423004)
  - Total Dissolved Solids
- LCS (Lab ID: 3481072)
  - Total Dissolved Solids

QC Batch: 880000

2e: See case narrative.

- BLANK (Lab ID: 3484907)
  - Total Dissolved Solids
- DUP (Lab ID: 3484909)
  - Total Dissolved Solids
- L-UWL-FB-1 (Lab ID: 60442423005)
  - Total Dissolved Solids
- LCS (Lab ID: 3484908)
  - Total Dissolved Solids

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PROJECT NARRATIVE

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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

General Information:
8 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

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
- 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

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PROJECT NARRATIVE

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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

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: 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

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

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 LCL1-Revised Report
Pace Project No.: 60442423

Sample: L-TMW-1 **Lab ID: 60442423001** Collected: 11/17/23 08:42 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	**108**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 11:42	7440-42-8	
Calcium	**160000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 11:42	7440-70-2	
Iron	**125**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 11:42	7439-89-6	
Magnesium	**36300**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 11:42	7439-95-4	
Manganese	**295**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 11:42	7439-96-5	
Potassium	**4450**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 11:42	7440-09-7	
Sodium	**9960**	ug/L	500	115	1	12/04/23 15:56	12/05/23 11:42	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**496**	mg/L	20.0	10.5	1		11/28/23 11:21		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**485**	mg/L	17.0	17.0	1		11/22/23 18:57		1e
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**25.6**	mg/L	20.0	10.5	20		12/05/23 20:55	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/05/23 20:21	16984-48-8	L1
Sulfate	**55.4**	mg/L	20.0	11.0	20		12/05/23 20:32	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

Sample: L-TMW-2 **Lab ID: 60442423002** Collected: 11/16/23 14:56 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	**156**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 09:01	7440-42-8	
Calcium	**254000**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 09:01	7440-70-2	
Iron	**76.6**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 09:01	7439-89-6	
Magnesium	**73700**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 09:01	7439-95-4	
Manganese	**2330**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 09:01	7439-96-5	
Potassium	**8010**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 09:01	7440-09-7	
Sodium	**18500**	ug/L	500	115	1	12/05/23 10:23	12/06/23 09:01	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**766**	mg/L	20.0	10.5	1		11/27/23 13:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**568**	mg/L	17.0	17.0	1		11/22/23 18:57		1e
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**19.9**	mg/L	5.0	2.6	5		12/06/23 21:12	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/05/23 20:44	16984-48-8	L1
Sulfate	**231**	mg/L	20.0	11.0	20		12/05/23 20:55	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

Sample: L-TMW-3 **Lab ID: 60442423003** Collected: 11/17/23 12:25 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	**114**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 09:09	7440-42-8	
Calcium	**145000**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 09:09	7440-70-2	
Iron	**1220**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 09:09	7439-89-6	
Magnesium	**30400**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 09:09	7439-95-4	
Manganese	**1190**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 09:09	7439-96-5	
Potassium	**5980**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 09:09	7440-09-7	
Sodium	**6400**	ug/L	500	115	1	12/05/23 10:23	12/06/23 09:09	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**448**	mg/L	20.0	10.5	1		11/28/23 11:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**1100**	mg/L	17.0	17.0	1		11/22/23 18:57		1e
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.3**	mg/L	1.0	0.53	1		12/05/23 21:06	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/05/23 21:06	16984-48-8	L1
Sulfate	**44.8**	mg/L	5.0	2.8	5		12/07/23 20:42	14808-79-8	M1

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

Sample: L-UWL-DUP-1 **Lab ID: 60442423004** Collected: 11/16/23 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	**153**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 09:16	7440-42-8	
Calcium	**260000**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 09:16	7440-70-2	
Iron	**72.4**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 09:16	7439-89-6	
Magnesium	**75000**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 09:16	7439-95-4	
Manganese	**2420**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 09:16	7439-96-5	
Potassium	**8130**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 09:16	7440-09-7	
Sodium	**18700**	ug/L	500	115	1	12/05/23 10:23	12/06/23 09:16	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**743**	mg/L	20.0	10.5	1		11/27/23 14:06		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**511**	mg/L	17.0	17.0	1		11/22/23 18:57		1e
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**17.6**	mg/L	1.0	0.53	1		12/05/23 23:00	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/05/23 23:00	16984-48-8	L1
Sulfate	**207**	mg/L	20.0	11.0	20		12/05/23 23:11	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

Sample: L-UWL-FB-1 **Lab ID: 60442423005** Collected: 11/17/23 08:40 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	**<6.4**	ug/L	100	6.4	1	12/05/23 10:23	12/06/23 09:18	7440-42-8	
Calcium	**28.4J**	ug/L	200	26.9	1	12/05/23 10:23	12/06/23 09:18	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	12/05/23 10:23	12/06/23 09:18	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	12/05/23 10:23	12/06/23 09:18	7439-95-4	
Manganese	**0.49J**	ug/L	5.0	0.39	1	12/05/23 10:23	12/06/23 09:18	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	12/05/23 10:23	12/06/23 09:18	7440-09-7	
Sodium	**<115**	ug/L	500	115	1	12/05/23 10:23	12/06/23 09:18	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		11/28/23 11:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**29.0**	mg/L	17.0	17.0	1		11/28/23 10:59		2e,H1
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		12/05/23 23:23	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/05/23 23:23	16984-48-8	L1
Sulfate	**<0.55**	mg/L	1.0	0.55	1		12/05/23 23:23	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

Sample: L-MW-26 **Lab ID: 60442419009** Collected: 11/17/23 11:27 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	**69.9J**	ug/L	100	6.4	1	12/04/23 15:56	12/05/23 11:06	7440-42-8	
Calcium	**147000**	ug/L	200	26.9	1	12/04/23 15:56	12/05/23 11:06	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	12/04/23 15:56	12/05/23 11:06	7439-89-6	
Magnesium	**27500**	ug/L	50.0	20.1	1	12/04/23 15:56	12/05/23 11:06	7439-95-4	
Manganese	**241**	ug/L	5.0	0.39	1	12/04/23 15:56	12/05/23 11:06	7439-96-5	
Potassium	**5170**	ug/L	500	69.7	1	12/04/23 15:56	12/05/23 11:06	7440-09-7	
Sodium	**5980**	ug/L	500	115	1	12/04/23 15:56	12/05/23 11:06	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**424**	mg/L	20.0	10.5	1		11/27/23 14:59		
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		1e,B0
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**10**	mg/L	1.0	0.53	1		12/07/23 10:27	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/07/23 10:27	16984-48-8	L2
Sulfate	**37.2**	mg/L	10.0	5.5	10		12/07/23 10:39	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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		1e,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	

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ANALYTICAL RESULTS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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		1e,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	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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, 60442419009

METHOD BLANK: 3467995 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419009

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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 LCL1-Revised Report
Pace Project No.: 60442423

QC Batch: 875682
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: 60442423001

METHOD BLANK: 3468002 Matrix: Water
Associated Lab Samples: 60442423001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/05/23 10:47	
Calcium	ug/L	<26.9	200	26.9	12/05/23 10:47	
Iron	ug/L	<9.1	50.0	9.1	12/05/23 10:47	
Magnesium	ug/L	<20.1	50.0	20.1	12/05/23 10:47	
Manganese	ug/L	<0.39	5.0	0.39	12/05/23 10:47	
Potassium	ug/L	<69.7	500	69.7	12/05/23 10:47	
Sodium	ug/L	<115	500	115	12/05/23 10:47	

LABORATORY CONTROL SAMPLE: 3468003

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	969	97	85-115	
Calcium	ug/L	10000	10000	100	85-115	
Iron	ug/L	10000	10100	101	85-115	
Magnesium	ug/L	10000	9890	99	85-115	
Manganese	ug/L	1000	1060	106	85-115	
Potassium	ug/L	10000	9690	97	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3468004 3468005

Parameter	Units	60442419012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	7640	1000	1000	8550	8740	91	110	70-130	2	20	
Calcium	ug/L	120000	10000	10000	128000	131000	85	114	70-130	2	20	
Iron	ug/L	5550	10000	10000	15700	15900	101	104	70-130	1	20	
Magnesium	ug/L	27300	10000	10000	37100	37800	98	105	70-130	2	20	
Manganese	ug/L	422	1000	1000	1450	1470	103	105	70-130	2	20	
Potassium	ug/L	5330	10000	10000	15800	15800	104	105	70-130	0	20	
Sodium	ug/L	75600	10000	10000	85600	87600	99	119	70-130	2	20	

MATRIX SPIKE SAMPLE: 3468006

Parameter	Units	60442420003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	803	1000	1780	97	70-130	
Calcium	ug/L	140000	10000	149000	94	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

MATRIX SPIKE SAMPLE: 3468006

Parameter	Units	60442420003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	14100	10000	24300	102	70-130	
Magnesium	ug/L	23700	10000	33700	99	70-130	
Manganese	ug/L	1690	1000	2730	104	70-130	
Potassium	ug/L	4380	10000	14500	101	70-130	
Sodium	ug/L	14900	10000	25700	108	70-130	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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: 60442423002, 60442423003, 60442423004, 60442423005

METHOD BLANK: 3468152 Matrix: Water
Associated Lab Samples: 60442423002, 60442423003, 60442423004, 60442423005

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 LCL1-Revised Report
Pace Project No.: 60442423

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 LCL1-Revised Report
Pace Project No.: 60442423

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

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

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 LCL1-Revised Report
Pace Project No.: 60442423

QC Batch: 874727 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442419009, 60442423002, 60442423004

METHOD BLANK: 3464569 Matrix: Water
Associated Lab Samples: 60442419009, 60442423002, 60442423004

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 LCL1-Revised Report
Pace Project No.: 60442423

QC Batch: 874879
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442423001, 60442423003, 60442423005

METHOD BLANK: 3465019 Matrix: Water
Associated Lab Samples: 60442423001, 60442423003, 60442423005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/28/23 10:06	

LABORATORY CONTROL SAMPLE: 3465020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	484	97	90-110	

SAMPLE DUPLICATE: 3465021

Parameter	Units	60442419012 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	343	346	1	10	

SAMPLE DUPLICATE: 3465022

Parameter	Units	60442423003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	448	452	1	10	

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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, 60442419009

METHOD BLANK: 3481069 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419009

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	1e,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	1e,B0

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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: 60442423001, 60442423002, 60442423003, 60442423004

METHOD BLANK: 3481071 Matrix: Water
Associated Lab Samples: 60442423001, 60442423002, 60442423003, 60442423004

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	1e

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	1e

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

QC Batch: 880000
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442423005

METHOD BLANK: 3484907 Matrix: Water
Associated Lab Samples: 60442423005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<17.0	17.0	17.0	11/28/23 10:59	2e

LABORATORY CONTROL SAMPLE: 3484908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	2e

SAMPLE DUPLICATE: 3484909

Parameter	Units	60442420009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	<17.0	<25.4		10	2e,H1

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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

QC Batch: 875610
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: 60442419002, 60442419003, 60442419009

METHOD BLANK: 3467695 Matrix: Water
Associated Lab Samples: 60442419002, 60442419003, 60442419009

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, 60442419009

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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

QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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: 60442423001, 60442423002, 60442423003, 60442423004, 60442423005

METHOD BLANK: 3468419 Matrix: Water
Associated Lab Samples: 60442423001, 60442423002, 60442423003, 60442423004, 60442423005

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: 60442423001, 60442423002, 60442423003, 60442423004, 60442423005

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: 60442423001, 60442423002, 60442423003, 60442423004, 60442423005

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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QUALITY CONTROL DATA

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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 LCL1-Revised Report
Pace Project No.: 60442423

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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QUALIFIERS

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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	See case narrative
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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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LCL1-Revised Report
Pace Project No.: 60442423

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
60442419009	**L-MW-26**	EPA 200.7	875680	EPA 200.7	875702
60442423001	**L-TMW-1**	EPA 200.7	875682	EPA 200.7	875700
60442423002	**L-TMW-2**	EPA 200.7	875737	EPA 200.7	875772
60442423003	**L-TMW-3**	EPA 200.7	875737	EPA 200.7	875772
60442423004	**L-UWL-DUP-1**	EPA 200.7	875737	EPA 200.7	875772
60442423005	**L-UWL-FB-1**	EPA 200.7	875737	EPA 200.7	875772
60442419002	**L-BMW-1S**	SM 2320B	874661		
60442419003	**L-BMW-2S**	SM 2320B	874661		
60442419009	**L-MW-26**	SM 2320B	874727		
60442423001	**L-TMW-1**	SM 2320B	874879		
60442423002	**L-TMW-2**	SM 2320B	874727		
60442423003	**L-TMW-3**	SM 2320B	874879		
60442423004	**L-UWL-DUP-1**	SM 2320B	874727		
60442423005	**L-UWL-FB-1**	SM 2320B	874879		
60442419002	**L-BMW-1S**	SM 2540C	878919		
60442419003	**L-BMW-2S**	SM 2540C	878919		
60442419009	**L-MW-26**	SM 2540C	878919		
60442423001	**L-TMW-1**	SM 2540C	878920		
60442423002	**L-TMW-2**	SM 2540C	878920		
60442423003	**L-TMW-3**	SM 2540C	878920		
60442423004	**L-UWL-DUP-1**	SM 2540C	878920		
60442423005	**L-UWL-FB-1**	SM 2540C	880000		
60442419002	**L-BMW-1S**	EPA 300.0	875610		
60442419003	**L-BMW-2S**	EPA 300.0	875610		
60442419009	**L-MW-26**	EPA 300.0	875610		
60442423001	**L-TMW-1**	EPA 300.0	875787		
60442423002	**L-TMW-2**	EPA 300.0	875787		
60442423003	**L-TMW-3**	EPA 300.0	875787		
60442423004	**L-UWL-DUP-1**	EPA 300.0	875787		
60442423005	**L-UWL-FB-1**	EPA 300.0	875787		

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WO# : 60442423

60442423

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

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 2.4/2.3/1.4 Corr. Factor -0.3 Corrected 2.1/2.0/1.1
14.5/14.9 14.2/14.6

Temperature should be above freezing to 6°C

Date and initials of person examining contents: 11/20/23

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#: 67167	☑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

60442423

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 LCL1	Invoice E-Mail:	mark.haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

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

County / State origin of sample(s): Missouri

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

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

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

DW PWSID # or WW Permit # as applicable:

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

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

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

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

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

Lab Use Only
Proj. Mgr: Jamie Church
AcctNum / Client ID:
Table #:
Profile / Template: 15857, Line 1
Prelog / Bottle Ord. ID: EZ 3011897

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-TMW-1	WT	G	11-17-23	0840				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
L-TMW-2	WT	G	11-16-23	1456				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
L-TMW-3	WT	G	11-17-23	1225				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
L-MW-26	WT	G	11-17-23	1127				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	log under LCPA-CA	
L-BMW-1S	WT	G	11-16-23	0850				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	log under LCPA-CA	
L-BMW-2S	WT	G	11-16-23	1018				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	log under LCPA-CA	
L-UWL-DUP-1	WT	G	11-16-23	—				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
L-UWL-FB-1	WT	G	11-17-23	0840				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
L-UWL-MS-1	WT	G	11-17-23	1225				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		
L-UWL-MSD-1	WT	G	11-17-23	1225				4	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		

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

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
Grant Morey / Rocksmith	11-17-23/1545		11/18/23 0455	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Delivered by: [ ] In-Person [ ] Courier
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	[ ] FedEX [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

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

Client: Rocksmith

Profile #

Site:

Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other	AG2S
1	WT												1						1			2	1								-
2	↓												1						1			↓	1								1
3	↓												3						3			↓	3								3
4																															
5																															
6																															
7	WT												1						1			↓	1								1
8	↓												↓						↓				↓								↓
9																															
10	↓												pH<2									↓									
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: 60442423

Internal Transfer Chain of Custody

☐ Rush Multiplier____X
☐ Samples Pre-Logged into eCOC

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

Workorder: 60442423 **Workorder Name:** AMEREN LCL1

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						Requested Analysis Radium 226	Radium 228											LAB USE ONLY
1	L-TMW-1	PS	11/17/2023 08:40	60442423001	Water	2						X	X											
2	L-TMW-2	PS	11/16/2023 14:56	60442423002	Water	2						X	X											
3	L-TMW-3	RQS	11/17/2023 12:25	60442423003	Water	2						X	X											
4	L-UWL-DUP-1	PS	11/16/2023 08:00	60442423004	Water	2						X	X											
5	L-UWL-FB-1	PS	11/17/2023 08:40	60442423005	Water	2						X	X											
6	L-UWL-MS-1	PS	11/17/2023 12:25	60442423006	Water	2						X	X											
7	L-UWL-MSD-1	PS	11/17/2023 12:25	60442423007	Water	2						X	X											

Transfers	Released By	Date/Time	Received By	Date/Time
1	JA Pace	11/21/23 1700		11-22-23 0910
2				
3				

Comments

Note: Sample 003 is parent sample for MS/MSD samples 006/007.

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.*

WO# : 30641409

30641409

DC#_Title: ENV-FRM-GBUR-0088 v06 Sample Condition Upon Receipt-Pittsburgh

Effective Date: 09/20/2023

WO#: 30641409

PM: MAR Due Date: 12/12/23

CLIENT: PACE_60_LEKS

Client Name: Pace - KS

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

Tracking Number: 6432 1395 1667

Initial / Date

Examined By: PS 11/27/23

Labeled By: PS 11/27/23

Temped By: BR 11-22-23

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

Comments:	Yes	No	NA	pH paper Lot# 1000831 / D.P.D. Residual Chlorine Lot # —
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:	✓			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 PS / 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 BR / Date: 11-22-23 / Survey Meter SN: 2504880

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.

Qualtrax ID: 55680

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 – LCL1 – Data Package 60442423**		

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren LCL1
Project Number: 23007
Reviewer: G. Morey
Validation Date: 1/30/2024

Laboratory: Pace Analytical
SDG #: 60442423
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-TMW-1, L-TMW-2, L-TMW-3, L-UWL-DUP-1, L-UWL-FB-1, L-UWL-MS-1, L-UWL-MSD-1, L-MW-26, 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			11/16/2023 - 11/17/2023
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 only includes 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		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:

One TDS sample was analyzed outside of hold time controls. Result qualified as estimate.

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, -003, and -009. Results > RL and 10x blank, no qualification necessary.

Field Blank:

L-UWL-FB-1 @ L-TMW-2: calcium (28.4J), manganese (0.49J), and TDS (29.0). No qualification necessary, results > RL and 10x blank.

Laboratory Control Samples:

3767696: LCS recovery low for fluoride, associated with samples -002, -003, and -009. Results qualified as estimates.

3470527: LCS recovery high for fluoride, associated with samples -001 through -005. All results non-detects, no qualification necessary.

Duplicates:

L-UWL-DUP-1 @ L-TMW-2: DUP RPD exceeds limit for TDS (10%), result qualified as an estimate.

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

MS/MSD:

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

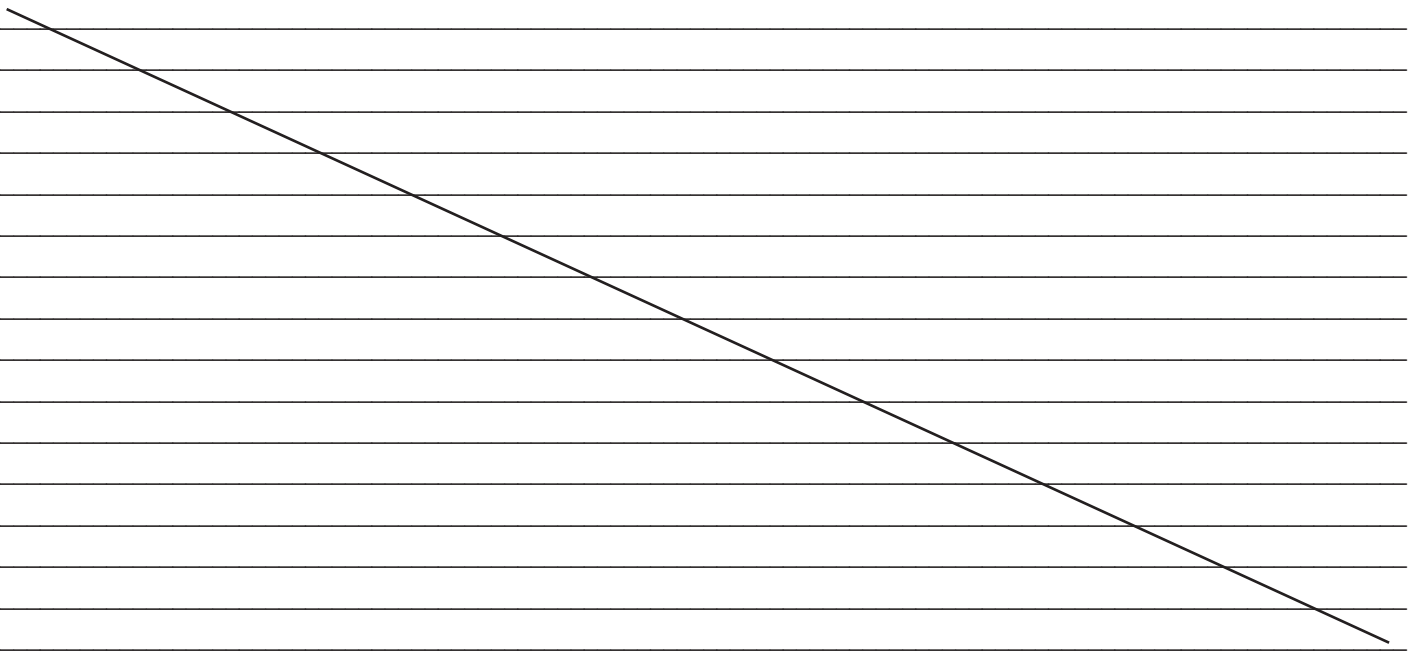
3468158: MS recovery low for calcium, associated with unrelated sample, no qualification necessary.

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

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



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-UWL-FB-1	TDS	29	J	Analyzed outside of hold time controls
L-MW-26	Fluoride	0.12	UJ	LCS recovery low
L-BMW-1S	"	0.12	UJ	"
L-BMW-2S	"	0.12	UJ	"
L-TMW-2	TDS	568	J	Field duplicate RPD exceeds control limits
L-UWL-DUP-1	"	511	J	"

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

REPORT

LCL1 – Alternative Source Demonstration

Labadie Energy Center, Franklin County, Missouri, USA

May 19, 2023

Submitted to:

Ameren Missouri
1901 Chouteau Ave, St. Louis, MO 63103

Submitted by:

Rocksmith Geoengineering, LLC

Table of Contents

TABLES

FIGURES

Certification Statement

This LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule under the direction of a licensed professional engineer with Rocksmith Geoengineering, LLC.

I hereby certify that this LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA 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

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this LCL1 – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for a Statistically Significant Increase (SSI) calculated at Ameren Missouri's (Ameren) Labadie Energy Center (LEC), Utility Waste Landfill (UWL) LCL1 or Cell 1. This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

2.0 SITE DESCRIPTION AND BACKGROUND

The LEC is located approximately 35 miles west of downtown St. Louis in Franklin County, Missouri, just south of the Missouri River. **Figure 1** depicts the site location and layout, including the location of LCL1. The LEC encompasses approximately 2,400 acres and is located within the Missouri River Valley. The facility is bounded to the north by the Missouri River, to the west by Labadie Creek, to the northeast and east by agricultural land, and to the south by a railroad line and bedrock bluffs.

2.1 Geological and Hydrogeological Setting

The site lies between the Missouri River (to the north) and bedrock bluffs (to the south). Flow and deposition from the Missouri River have resulted in thick alluvial deposits that lie on top of bedrock. These alluvial deposits, which can range from approximately 90 to 120 feet thick, comprise the uppermost aquifer. Overall, this alluvial aquifer is described as a fining-upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Based on drilling records, the alluvial aquifer is divided into sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region consists of Ordovician-aged rock. Formations include primarily limestone, dolomite, sandstone, and shale and are comprised of the Plattin Group, Joachim Dolomite, St. Peter Sandstone, Powell Dolomite, and the Cotter/Jefferson City Dolomites.

2.2 Utility Waste Landfill Cell 1 – LCL1

UWL Cell 1 is referred to by Ameren as the LCL1, or Cell 1. The LCL1 is approximately 31 acres in size and is located east of the generating plant (**Figure 1**). The CCR Unit manages CCR from the LEC and is permitted to accept fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels. Currently, the LCL1 is used for the dry disposal of fly ash and bottom ash from the LEC.

The LCL1 was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by a 60-mil High Density Polyethylene (HDPE) geomembrane liner. Information on the design of the UWL is available in the 2013 Proposed Construction Permit application (Gredell and Reitz & Jens, 2013).

A groundwater monitoring well network was installed in 2013 and 2014 to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of 36 monitoring wells surrounding the current and future extents of the UWL (**Figure 1**). Most of these monitoring wells are screened in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for groundwater. Three monitoring wells (MW-33(D), MW-34(D), and MW-35(D)) are installed in the intermediate/deeper zones of the alluvial aquifer. Groundwater samples have been collected in most of these monitoring wells since April 2013 and tested for the MDNR UWL parameters. In April 2017, four (4) monitoring wells were installed and added to this network along Labadie Bottoms Road (S-1, S-2, S-3, and S-4).

The permit for the LCL1 was issued October 27, 2016 (permit #0907101). Eleven sampling events were performed prior to October 27, 2016 at most of the state required UWL monitoring wells, and four rounds of baseline CCR Rule sampling were completed at CCR Rule monitoring wells (discussed below). These results

represent groundwater quality prior to CCR placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

2.3 CCR Rule Groundwater Monitoring

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

The groundwater monitoring system for the LCL1 consists of six monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Two existing monitoring wells (MW-26 and TMW-1) were installed by Reitz & Jens, Inc. in 2013 as a part of the state UWL monitoring program. The remaining monitoring wells (TMW-2, TMW-3, BMW-1S, and BMW-2S) were installed by Golder Associates Inc. (Golder) in 2015 and 2016 for CCR Rule groundwater monitoring purposes. More information regarding the design and installation of the monitoring wells is provided in the LCL1 GMP (Golder, 2017) and the LCL1 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight baseline sampling events were completed for the LCL1. After baseline sampling, Detection Monitoring events have been completed twice a year generally once in Q2 and once in Q4. April 2022 was the last Detection Monitoring sampling event. Laboratory testing was performed for the following Appendix III constituents during each Detection Monitoring event:

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

Background results from the eight baseline sampling events were used to calculate statistical upper prediction limits (UPL). These UPLs were then compared to the Detection Monitoring results. If the result from the current Detection Monitoring event was higher than the calculated UPL, the result was considered an initial exceedance, and verification sampling was performed in accordance with the LCL1 statistical analysis plan. Per the statistical analysis plan, after the May 2019 sampling event, the UPLs were updated to incorporate results from four of the Detection Monitoring events. The UPLs were updated again following the April 2021 sampling event after an additional four Detection Monitoring events were completed.

Since November 2017, several ASDs have been prepared for SSIs identified at wells MW-26, TMW-1 and TMW-2. These previous ASDs are available in the 2018, 2019, 2020, 2021 and 2022 Annual Reports for the LCL1 and are available on Ameren's publicly available CCR Compliance website (https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports). These ASDs have demonstrated that previous SSIs at the site were not caused by the LCL1, but rather were primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer, or primarily caused by the LCL1's location being downgradient from the LCPA, which is currently in corrective action. Additionally, soluble salts associated with the gravel and concrete construction of the LCL1 display an increase in constituent concentrations that correlate with the time of placement and LCL1 construction activities and the net groundwater movement at the site.

In October 2022, 5 initial exceedances were identified for calcium, chloride, sulfate, and TDS at TMW-2 and chloride at MW-26. Verification sampling results confirmed each of the initial exceedances to be an SSI. Results from this sampling event are provided in **Table 1**.

2.4 Review of the Statistically Significant Increases

The SSIs for calcium, chloride, sulfate, and TDS occurred at monitoring well TMW-2 as well as for chloride at MW-26 and the values are presented on **Table 1**. These monitoring wells are screened in the upper portion of the alluvial aquifer, just below the average seasonal low for groundwater. As shown on **Figure 1**, TMW-2 is located to the northeast of the LCL1 and MW-26 is located west of the LCL1. Both of these wells are east of the generating plant as well as surface impoundments LCPA and LCPB. Closure of the LCPA was substantially completed before the April 2021 sampling event, with the completion of the liner cover system on December 30, 2020.

Based on review of the pre-disposal data discussed in Section 2.2 above, as well as our comparison of the pre-disposal data with the results from the eight CCR-Rule baseline events, the groundwater at the LCL1 contains low-level, pre-existing CCR impacts from units/activities that pre-dated disposal activities in the LCL1. As a result of these pre-existing impacts, the LCL1 statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from background wells, such that individual limits are calculated for each constituent in each well in the monitoring program.

3.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Multiple lines of evidence indicate that the SSIs are not the result of a release from the LCL1 but are rather from an alternative source. The following bullets summarize the different lines of evidence that support this ASD:

- Pre-existing, low-level concentrations of CCR impacts in groundwater that pre-date the installation and operation of LCL1.
- Construction of the LCL1 with a 60-mil geomembrane liner and a 2-foot thick clay barrier.
- Location near fresh limestone and dolomitic gravels, and the potential geochemical influence from the LCL1 gravel construction materials and parking lot/road salting on shallow groundwater.
- Lack of key CCR Indicators (boron, molybdenum) in monitoring wells with SSIs.
- Data validation has identified some high biased results that are not representative of the groundwater quality at the monitoring wells.

3.1 CCR Indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 2** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 2: Types of CCR and Typical Indicator Parameters

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Fly Ash	Fine grained, powdery material composed mostly of silica made from the burning of finely ground coal in the boiler.	• Boron • Molybdenum • Lithium • Sulfate • Bromide • Potassium • Sodium • Fluoride
Boiler Slag / Bottom Ash	Molten bottom ash from the slag tap and cyclone type furnaces that turns into pellets that have a smooth glassy appearance after quenching with water.	

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Flue Gas Desulfurization Material (FGD)	A material leftover from the process of reducing sulfur dioxide emissions from a coal-fired boiler that can be a wet sludge consisting of calcium sulfite or calcium sulfate or a dry powdered material that is a mixture of sulfites and sulfates.	• Sulfate • Fluoride • Calcium • Boron • Bromide • Chloride

Notes:

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

As described above, the LCL1 has historically received fly ash. No FGD type wastes are managed at the LEC.

3.2 Evaluation of SSIs at TMW-2

3.2.1 Boron Concentrations

As indicated in **Table 2**, boron is a key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present at relatively high concentrations in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). This non-reactive and mobile nature makes boron an early and key indicator of impacts from a CCR Unit. Boron is also present in the monitoring wells around the LCPA and has been shown to be a key indicator for CCR impacts at this site. Therefore, if groundwater was impacted by the LCL1, current boron concentrations should be statistically elevated with respect to pre-CCR placement downgradient of the LCL1.

Figure 2 displays boron concentrations at TMW-2 as well as the two shallow background wells for the LEC for the entire historical monitoring period. At TMW-2, boron concentrations have varied over time with values ranging from 86.8 J to 132 micrograms per liter (µg/L). The intrawell UPL for boron at TMW-2 is 134.3 µg/L. Throughout this same timeframe, boron concentrations in the background wells BMW-1S and BMW-2S, which have no pre-existing CCR impact and are located approximately 2.5 miles to the west of the LCL1, have had values ranging between non-detect (< 50 µg/L) to 151 µg/L. The interwell UPL for boron (based on LEC background wells) is 147 µg/L.

As displayed in **Figure 2**, the most recent boron concentration at TMW-2 (115 µg/L) is below the UPL for both TMW-2 and the background monitoring wells and is consistent with previous results. The absence of boron exceedances at TMW-2 demonstrates that elevated concentrations for other constituents are related to an alternative source, rather than LCL1.

3.3 Constituents of Interest (COI) at TMW-2

As discussed in Section 3.0, there are four verified SSIs from the October 2022 sampling event, all at monitoring well TMW-2, including calcium, chloride, sulfate, and TDS (referred to hereafter as the Constituents of Interest or COIs). To determine the source for the recent exceedances for the COIs, values were compared to background and different source water datasets. **Figures 3 to 9** are timeseries plots displaying the concentrations of the COIs, magnesium, alkalinity, and sodium compared to shallow background concentrations from background wells located 2.5 miles upgradient of the LCL1. As displayed on these figures, there is an increase in each of the COIs since April 2021, however, as discussed in section 4.2, the absence of boron with the other exceedances indicates that it is unlikely that these low-level SSIs are caused by CCR impacts.

Table 3 below displays concentration data for the COIs, alkalinity, and magnesium from the October 2022 and January 2023 sampling events as compared with the CCR porewater concentrations from the LCPA (contains bottom ash and fly ash) and the LCPB (contains fly ash).

Table 3: Comparison of TMW-2 SSI and Porewater Concentrations

Constituent (Units)	October 2022 Result at TMW-2	January 2023 Result at TMW-2	LCPA Porewater Range	LCPB Porewater Range
Calcium (µg/L)	246,000	288,000	76,500 – 106,000	11,400 – 22,600
Chloride (mg/L)	18.2	32.9	15.2 – 25.5	15.6 – 18.4
Sulfate (mg/L)	247 J	390 J	254 – 306	728 – 1,060
Total Dissolved Solids (mg/L)	1,070	1,340	528 – 642	1,860 – 2,850
Magnesium (µg/L)	67,300	Not Sampled	184 – 45,500	84.4 – 386
Alkalinity (mg/L)	651	Not Sampled	77.6 – 208	861 – 1,340
Sodium (µg/L)	18,000	Not Sampled	50,500 - 84,000	750,000 – 969,000

Notes:
1) µg/L – Micrograms per liter.
2) mg/L – Milligrams per liter.
3) J – Result is an estimated value based on data validation.

As displayed in **Table 3**, porewater samples collected from the LCPA and LCPB CCR units indicate that CCR is not a potential source for increases in calcium or magnesium at TMW-2, as the concentrations in porewater are lower than those found in groundwater at TMW-2. This, combined with a lack of the key CCR indicator, boron, indicates that an alternative source is responsible for exceedances present at TMW-2.

3.3.1 Nearby Carbonate Gravel Roadways and Concrete Construction as Potential Source

In addition to the lines of evidence presented above, the recent placement of fresh, crushed limestone ($CaCO_3$)/dolomite ($CaMg(CO_3)_2$) gravel and concrete near well TMW-2 is a potential source of the elevated COI concentrations reported in the shallow well TMW-2. As displayed in **Figure 10**, the area around TMW-2 has had a significant amount of construction activity during the past several years associated with LCL1 construction, and fresh limestone and dolomite gravels, as well as concrete, have been placed near TMW-2 in the following locations:

1) After construction of the LCL1, Labadie Bottom Road was re-graded and fresh, crushed gravel was placed on the road in late 2018 to early 2019. TMW-2 is located approximately 30 feet south and east of the new gravel roads as displayed in **Figure 10.**

2) The LCL1 Cell was constructed between 2015 and October 2016 and is constructed with gravel roads at the top of the unit, gravel beneath the fabric-formed articulated concrete mat (FCM) side slopes of the unit, and a gravel road at the base of the LCL1 as displayed in **Figure 10**. TMW-2[1] is approximately 145 feet from the toe of the berm. Based on aerial imagery and photographs, completion of the FCM and gravel road began in April 2016 and were completed by October 2016.

[1] The location of TMW-2 is as close as was feasible to the LCL1 in 2016 in order to comply with the timeframes of the CCR Rule. Construction activities associated with the LCL1 and a nearby gas pipeline made it so the closes practicable location for TMW-2 was ~145 feet from the toe of the berm at the LCL1.

3) During the construction of the LCL1, fresh limestone/dolomite gravel was placed just to the east of the LCL1 and ~50 feet west of TMW-2. This gravel area was used as a parking area during construction and as a staging and laydown area for equipment. Based on onsite photos and aerial imagery, the gravel area was built in April 2016, and was removed after completion of the LCL1, in late 2016. The parking area is approximately 50 – 125 feet to the west/southwest of TMW-2. An image displaying the north end of the parking area is provided in **Figure 11**.

Figure 11 - North Area of LCL1 Construction Parking

The gravel used for the roadways, under the FCM, and parking lots nearby consists mostly of limestone and dolomite and contains some calcite sourced from nearby quarries. Precipitation and infiltration of surface water through fresh gravel, salting of gravel and road surfaces, and concrete that contains water-soluble salts leach soluble components into the shallow groundwater and can cause an increase in the COIs observed in TMW-2.

The potential impact of carbonate rocks and their associated water-soluble salts has been studied since the 1950s, and Lamar and Shorde (1953) determined that soluble salts in dolomite and limestone commonly contain increased amounts of magnesium, bicarbonate (alkalinity), chloride, calcium, and sulfate. Numerous studies and geochemistry textbook citations since that time have confirmed these findings. Concrete is also known to contain water-soluble salts (Cheng et al., 2013) similar to those discussed for carbonate gravels with increased levels of calcium, chloride, and sulfate. The leaching of these salts from concrete is called efflorescence, and it can be common in the concrete construction industry. Efflorescence, the migration of salts to the surface, is typically described as a whitish colored powder that coats the surface of the concrete. As with the carbonate gravels, precipitation and runoff of surface water from the concrete FCM and associated water-soluble salts leaches soluble components into the shallow groundwater and can cause an increase in the COIs observed in TMW-2.

3.3.2 Hydraulic Connection Between Potential Fresh Carbonate Gravel/Concrete Sources and TMW-2

As discussed in the 2022 LCL1 Annual Report (WSP, 2023), net groundwater flow at the site is estimated to be approximately 18 feet per year toward the northeast. Based on the net groundwater flow, both the former gravel parking and laydown area associated with the construction of the LCL1, and the gravel roads/ and exposed FCM concrete/ berm associated with the finished LCL1 cell are likely sources for COI impacts at TMW-2.

The FCM and the gravel road at the top of the berm around the LCL1 were placed on top of compacted earth fill and were sloped to drain surface water toward the gravel road at the toe of the berm surrounding the LCL1 (Gredell and Reitz & Jens, 2013). Historical aerial images (See **Figure 12** In text) display that the surface water runoff from the FCM is occurring as designed with some pooling of surface water below the berm and is causing increased infiltration over the former gravel area. As discussed above, the water that is infiltrating into the groundwater will have leached available water-soluble salts from the FCM concrete and the underlying carbonate gravel/rock base.

Figure 12 – Historic Aerial Images near TMW-2

Notes:

1) Aerial images from Google Earth ®

As discussed above, the FCM, gravel roads associated with the UWL, and the gravel area located just west of TMW-2 were built between April and October 2016. These potential upgradient leaching sources are located approximately 50 to 145 feet upgradient of TMW-2. Based on the net groundwater flow rate (~18 feet per year average), leaching impacts from these carbonates and associated salt sources would be expected to reach well TMW-2 between 2019 and 2024.

As displayed in **Figure 3**, calcium concentrations at TMW-2 display an overall increasing trend since April 2020. This corresponds with the date range that would be expected for impacts caused by the leaching of the water-soluble salts associated with the fresh carbonate gravel/rock placement during the LCL1 construction and adjacent parking area construction. Additionally, as discussed above, CCR placed in the LCL1 is not a potential source for increases in calcium at TMW-2, as the concentrations in CCR porewater at LEC are lower than those found in groundwater at TMW-2 and in the background wells. Therefore, leaching of the gravel and concrete water-soluble salts provides the most likely explanation for the increase in calcium concentrations at TMW-2, as fresh carbonates have been demonstrated to cause increases to calcium concentrations to groundwater (Lamar and Shorde, 1953) and the potential carbonate source is upgradient and hydrologically connected to TMW-2.

In addition to calcium impacts, magnesium, alkalinity, chloride, sulfate, sodium, and TDS display very similar trends to calcium (see **Figures 4-9**), with increasing concentrations in the same timeframe. Increases in these constituents, especially those that are not a result of CCR influence (i.e., calcium, magnesium, alkalinity, as shown in **Table 3**), coupled with a lack of increasing boron, indicates that these impacts are not from CCR influence on the groundwater, but are most likely related to leaching of fresh carbonate gravel and concrete and their associated soluble salt sources.

Lastly, the documented construction of the LCL1, with a robust, engineered base liner system constructed of 2 feet of low-permeability compacted clay overlain by a 60-mil HDPE liner, also limits the potential that the October 2022 SSIs reported for TMW-2 are a result of influence from the LCL1. These lines of evidence collectively indicate that the SSIs observed in TMW-2 are not the result of impacts from the LCL1.

3.4 Evaluation of SSIs at MW-26

3.4.1 Boron Concentrations

As indicated in **Table 2**, boron is a key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present at relatively high concentrations in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). This non-reactive and mobile nature makes boron an early and key indicator of impacts from a CCR Unit. Boron is

also present in the monitoring wells around the LCPA and has been shown to be a key indicator for CCR impacts at this site. Therefore, if groundwater was impacted by the LCL1, current boron concentrations should be statistically elevated with respect to pre-CCR placement downgradient of the LCL1.

Figure 13 displays boron concentrations at MW-26 as well as the two shallow background wells for the LEC for the entire historical monitoring period. At MW-26, boron concentrations have varied over time with values ranging from ND < 100.0 to 120 µg/L, which several high outliers as discussed in the November 2019 and April 2021 LCL1 ASDs. The intrawell UPL for boron at MW-26 is 102.8 µg/L. Throughout this same timeframe, boron concentrations in the background wells BMW-1S and BMW-2S, which have no pre-existing CCR impact and are located approximately 2.5 miles to the west of the LCL1, have had values ranging between non-detect (< 50 µg/L) to 151 µg/L. The interwell UPL for boron (based on LEC background wells) is 147 µg/L.

As displayed in **Figure 13**, the most recent boron concentration at MW-26 (68.3 J µg/L) is well below the UPL for both MW-26 and the background monitoring wells and is consistent with previous results. The absence of boron exceedances at MW-26 demonstrates that elevated concentrations for other constituents are related to an alternative source, rather than the LCL1.

3.5 Chloride Concentrations at MW-26

Chloride is not listed in **Table 2** as an indicator of fly ash or boiler slag/bottom ash (EPRI 2012, EPRI 2017) because it typically has low concentrations in CCR leachate relative to typical background. It can be an indicator however, if concentrations in the source are higher than background levels. Chloride is typically a key indicator for FGD type wastes and is commonly found near salt and brine treated roadways where it can be a good indicator because it, like boron, has high mobility and low reactivity in most aquifer conditions. There is no FGD waste at the LEC, and fly ash or bottom ash/boiler slag are the typical wastes in the LCPA, LCPB, and LCL1.

As displayed in **Figure 14**, chloride concentrations for the October 2022 sampling event and subsequent verification sampling event are 10.3 J and 8.7 J mg/L, respectively. The calculated UPL for MW-26 is 6.76 mg/L and the UPL for the shallow background monitoring wells located 2.5 miles upgradient of the LCL1 (BMW-1S and BMW-2S, used for LCPB interwell statistical evaluation) is 7.654 mg/L with two high outliers at 8.2 and 21.2 mg/L. MW-26 is west of the LCL1 (**Figure 1**) and near an access road intersection where road salting occurs in winter. As discussed in the 2022 Annual Report (WSP, 2023), groundwater flow in the area around MW-26 has a net flow toward the northeast for the past several years, making MW-26 an upgradient well to the LCL1. Therefore, a lack of elevation boron and the location of MW-26 indicate that the elevated concentrations of chloride at MW-26 are not from the LCL1, but rather come from an alternative source.

Both the October 2022 and January 2023 sampling results are considered estimated (J-flagged) values based on level 2 data validation completed after each sampling event. The October 2022 sampling result was flagged by data validation because the Matrix Spike (MS) and Matrix Spike Duplicate (MSD) percent recovery were outside of the control limits. The result of this is a J+ qualifier. The USEPA describes a J+ qualifier as *"the result is an estimated quantity, but the result may be biased high"* (USEPA, 2020). The January 2023 sampling result was also flagged as an outlier. In this case, the duplicate Quality Assurance/Quality Control (QAQC) sample was collected at MW-26 during the verification sampling event. The duplicate sample, which was collected at the same time as the original sample, had a chloride result of 2.7 mg/L. The Relative Percent Difference (RPD) between the parent and the duplicate sample was greater than 20% (105.3% for chloride) therefore the value was flagged. Both of these estimated results bring into question the accuracy of the October 2022 and January 2023 sampling results for chloride at MW-26 due to laboratory errors. The duplicate value of 2.7 mg/L on the January 2023 sampling result is well below the intrawell limit of 6.76 mg/L and if the duplicate value is used, there would be no SSI.

Therefore, based on data validation results, the elevated chloride results from the October 2022 and subsequent January 2023 sampling events appear to be biased high based on laboratory error. These errors, coupled with a lack of elevated boron and the location of MW-26 on the upgradient side of the LCL1 demonstrate that the elevated chloride concentrations are not from the LCL1.

4.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY LCL1 IMPACT

Based on the information presented in Section 3.0 above, the SSIs reported for TMW-2 during the October 2022 monitoring event are not a result of impacts from the LCL1. The SSIs appear to be a result of the limestone/ dolomite gravel, parking lot/road salting, and leaching of concrete placed upgradient of TMW-2 that has migrated downgradient into shallow groundwater to TMW-2. Soluble salts associated with the gravel and concrete (calcium, chloride, sulfate, magnesium, alkalinity, and TDS) display an increase in concentration that correlates with the time of placement and LCL1 construction activities and the net groundwater movement at the site. These trends, coupled with the lack of boron increases and robust engineered construction of the LCL1, indicate that the changes in concentration are not caused by the LCL1, but rather the upgradient gravel and exposed concrete materials and their use in LCL1 construction.

At MW-26, the chloride SSI from the October 2022 sampling event is not a result of impacts from the LCL1, but rather appears to be the result of laboratory errors that elevate the results for MW-26 and may also be related to road salting activity at the nearby access road intersection. Data validation completed after the October 2022 and January 2023 events display that the results determined by the laboratory were not reliable based on the QAQC sampling completed during each event. Additionally, a lack of elevated boron at MW-26 demonstrates that the elevated chloride results are not from impacts from the LCL1.

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Tables

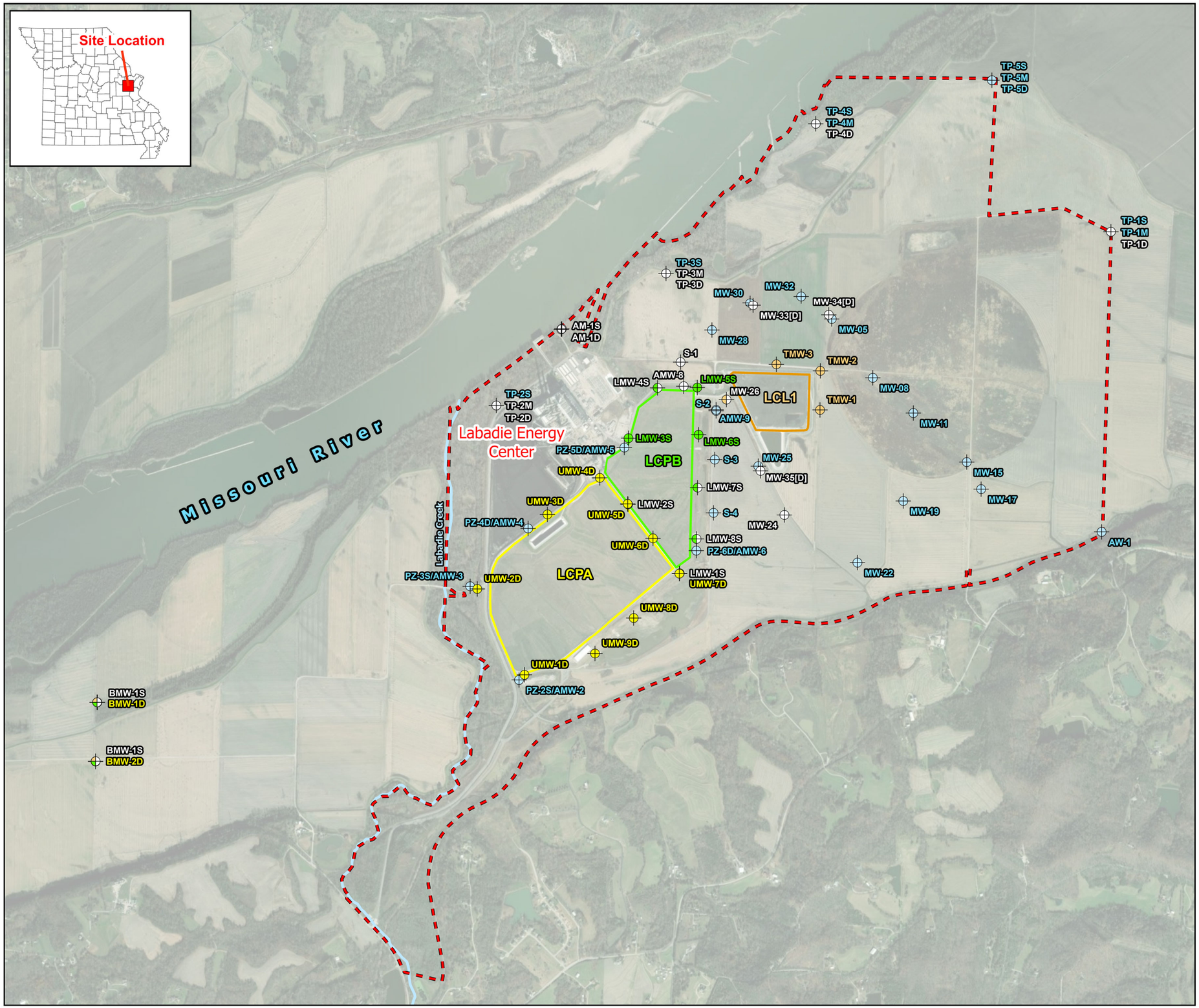
Table 1
October 2022 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
October 2022 Detection Monitoring Event											
DATE	NA	10/27/2022	10/27/2022	NA	10/24/2022	NA	10/26/2022	NA	10/25/2022	NA	10/26/2022
pH	SU	6.68	6.95	6.658-7.339	6.80	6.683-7.105	6.80	6.42-7.17	6.67	6.585-7.07	6.79
BORON, TOTAL	µg/L	91.2 J	45.3 J	102.8	68.3 J	121.6	115	134.3	115	136.9	98.3 J
CALCIUM, TOTAL	µg/L	185,000	146,000	155,150	128,000	183,389	159,000	205,487	246,000 J	202,001	134,000
CHLORIDE, TOTAL	mg/L	5.9	1.4	6.76	10.3 J	5.718	3.2 J	7.142	18.2	8.621	3.1
FLUORIDE, TOTAL	mg/L	ND	ND	0.2118	ND	0.2975	ND	0.2972	ND	0.2626	ND
SULFATE, TOTAL	mg/L	66.5	34.4	38.24	31.3	128	70.8	115.5	247 J	104	39.5
TOTAL DISSOLVED SOLIDS	mg/L	710	496	543.7	493	733.7	664	815.4	1,070	815.4	496
January 2023 Verification Sampling Event											
DATE	NA				1/5/2023				1/5/2023		
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L								288,000		
CHLORIDE, TOTAL	mg/L				8.7 J				32.9		
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L								390 J		
TOTAL DISSOLVED SOLIDS	mg/L								1,340		

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. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: JSI
Checked By: JSI
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.

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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

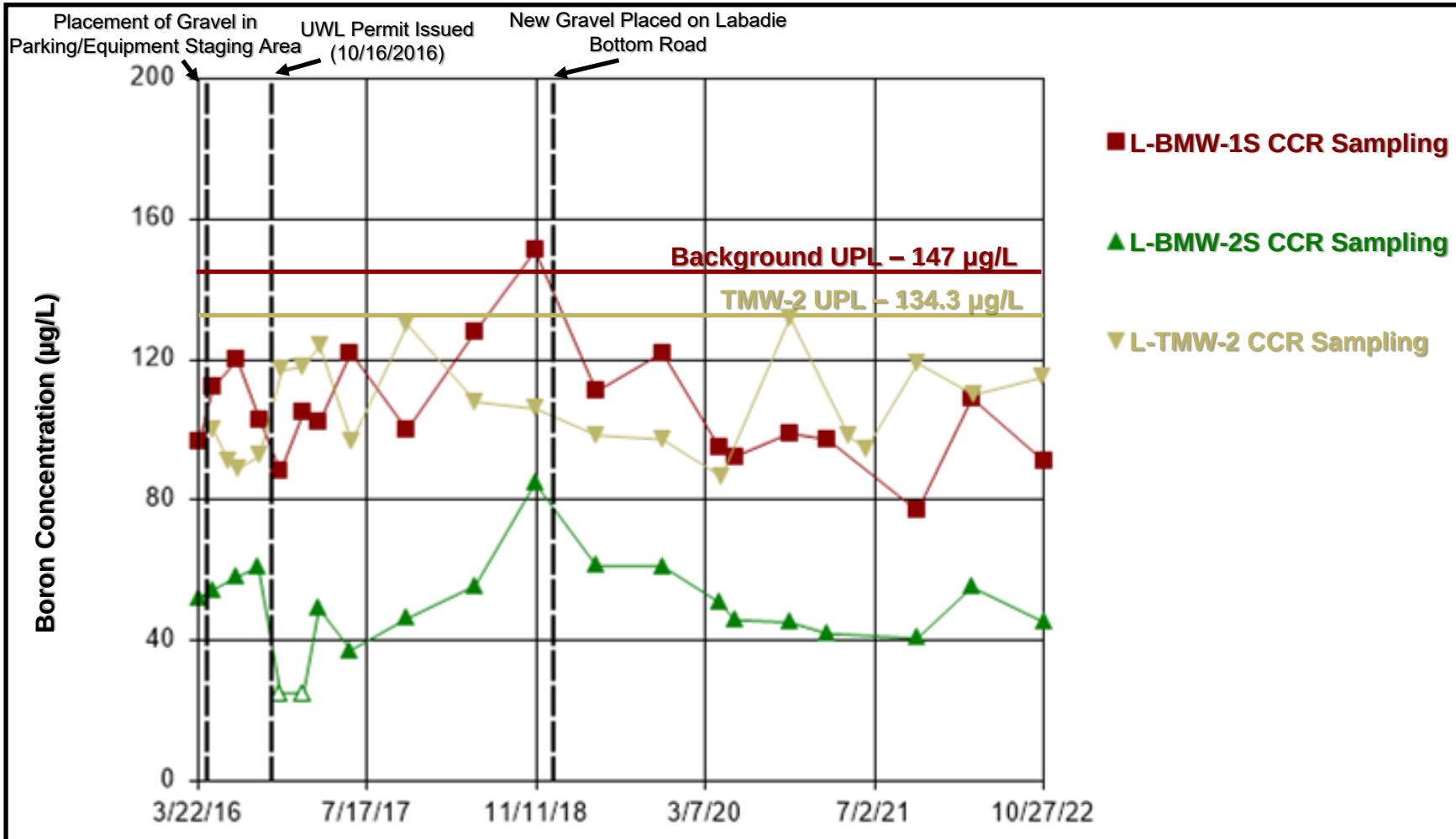
DESIGN	JSI	YYYY-MM-DD	2023-03-18
PREPARED	JSI	PROJECT No.	23007
REVIEW	GTM		
APPROVED	MNH		

FIGURE 1

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

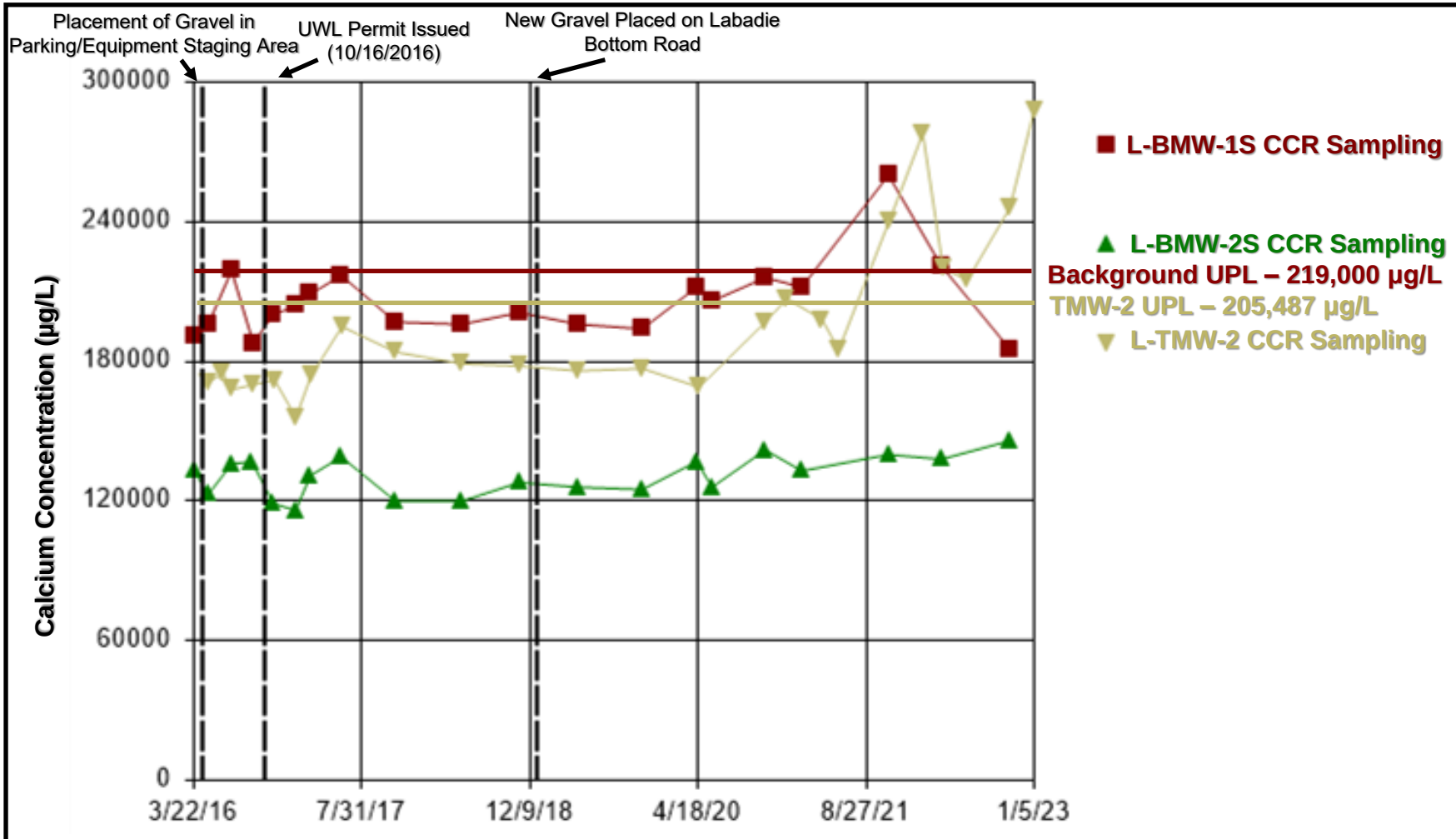
1 in
0

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



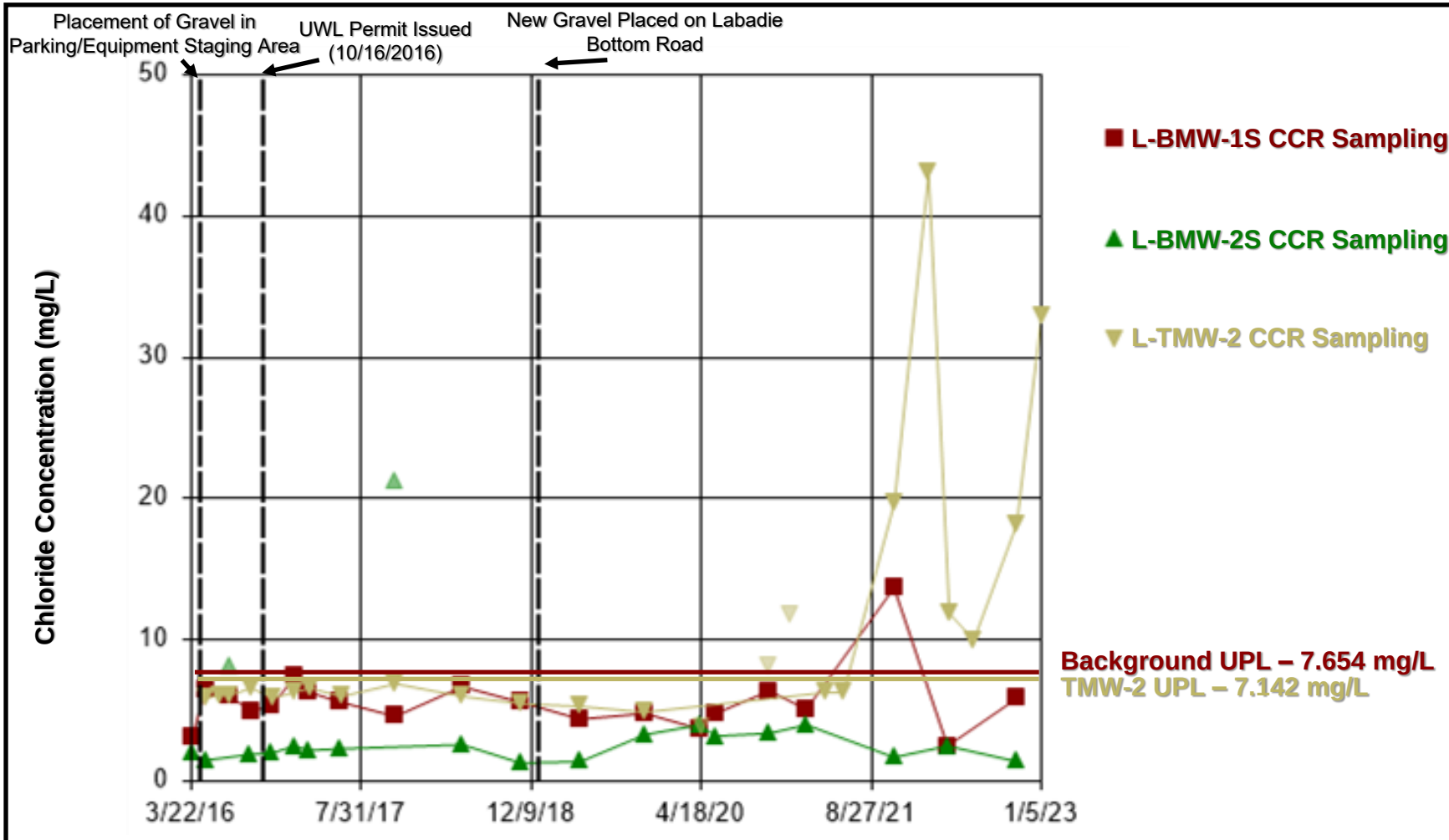
Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Boron Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-23	NA	23007	2



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

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Calcium Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-23	NA	23007	3



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Chloride Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
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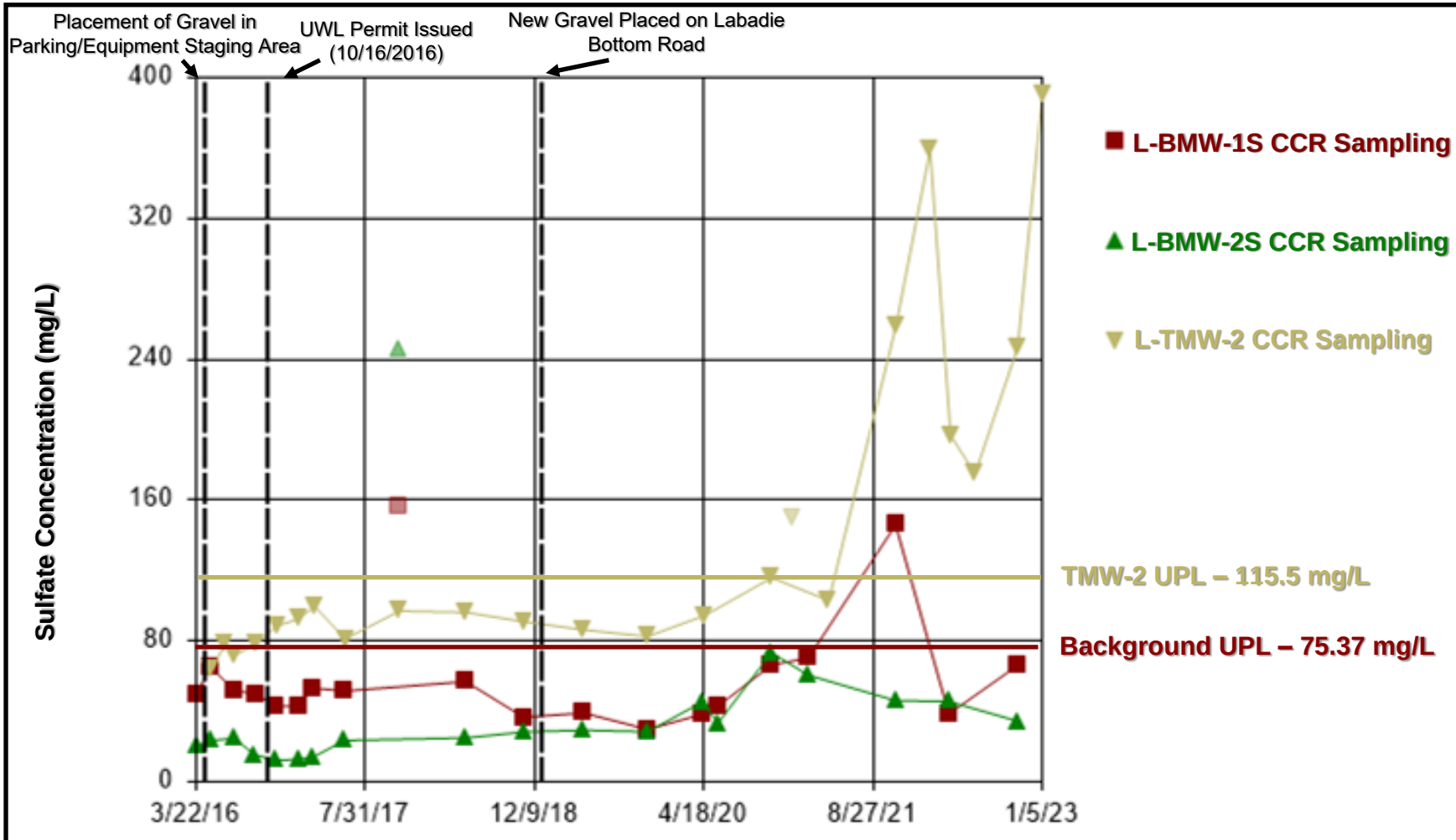

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Sulfate Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-23	NA	23007	5

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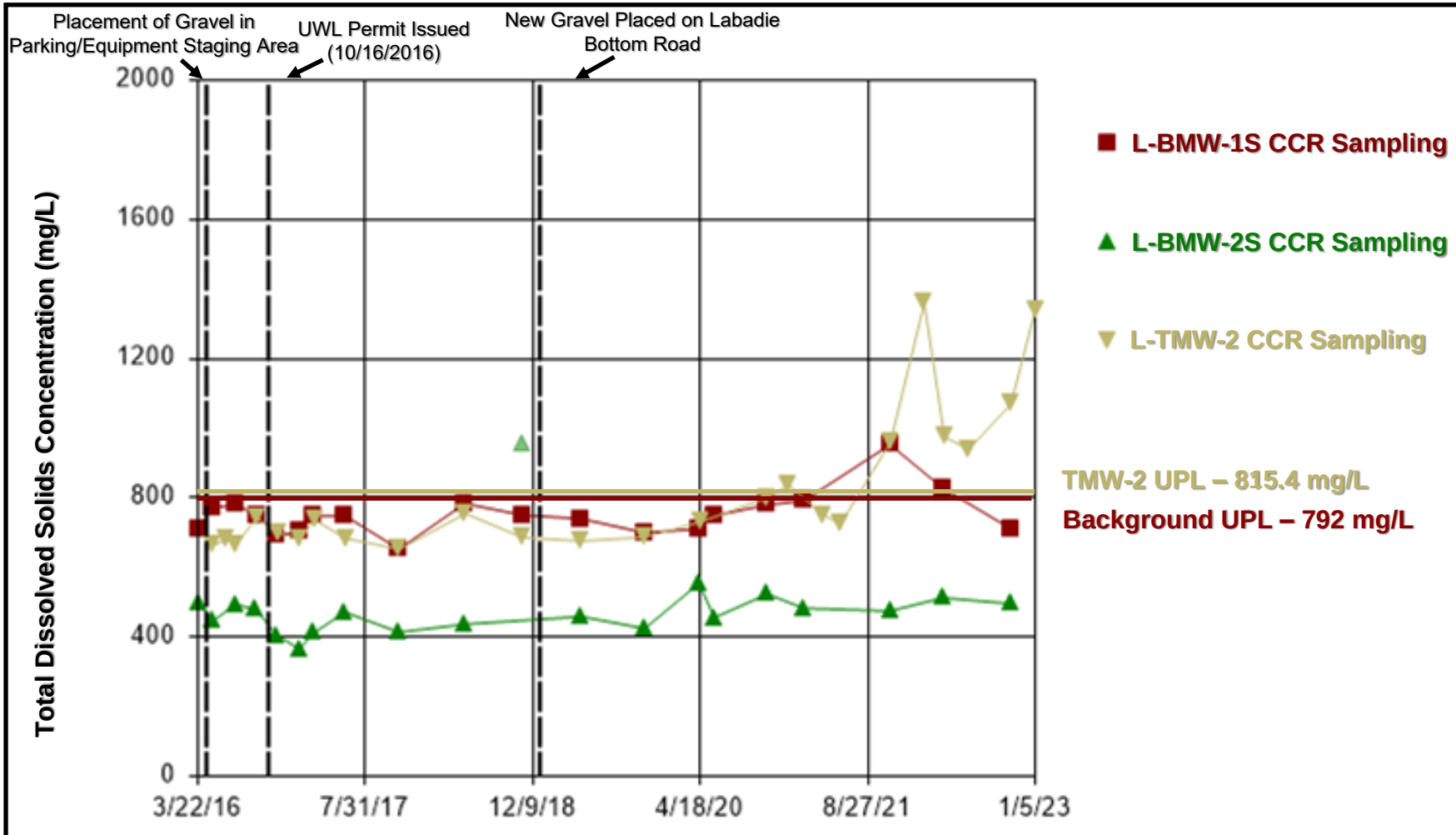
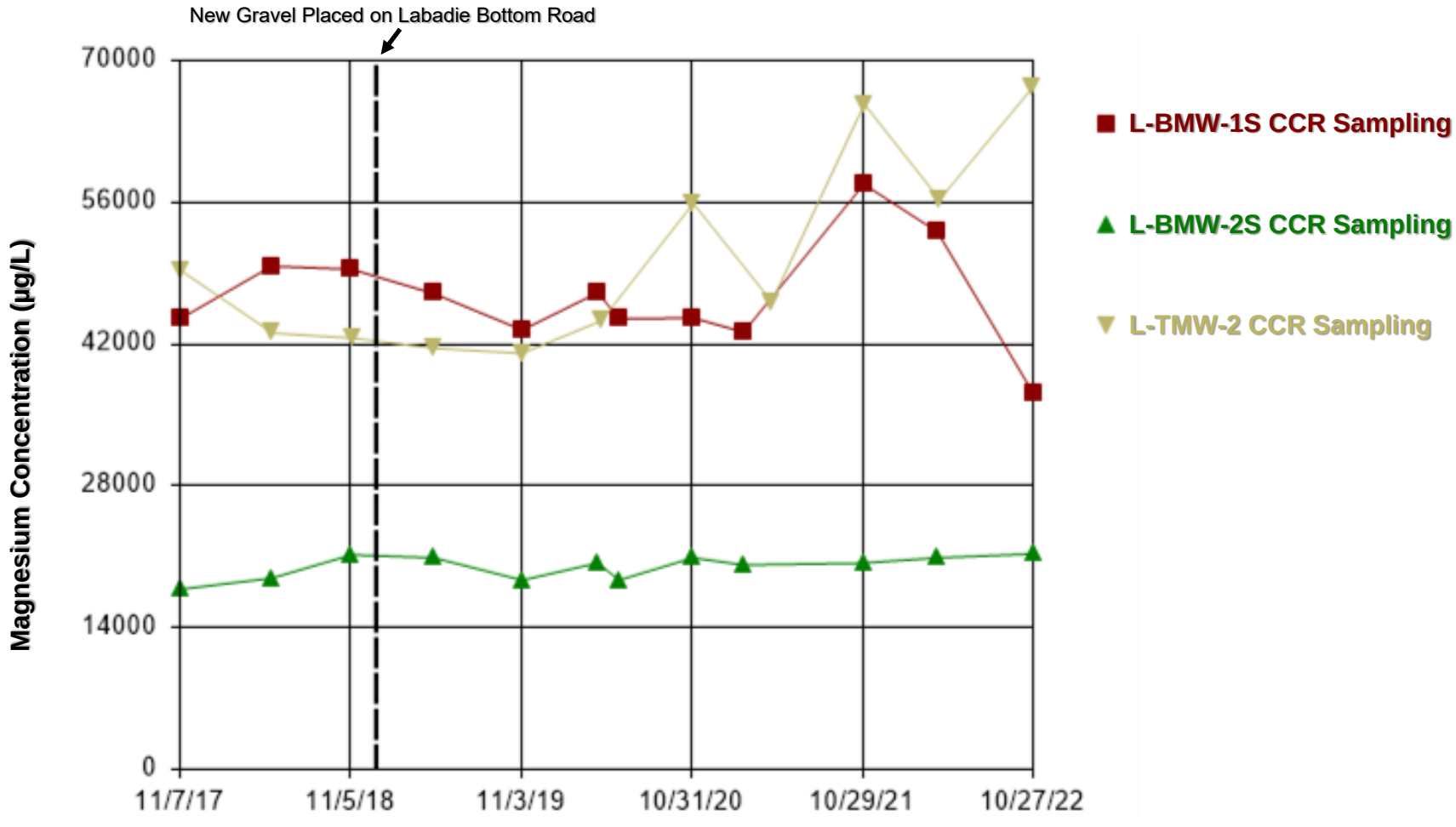


Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Total Dissolved Solids Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-23	NA	23007	6

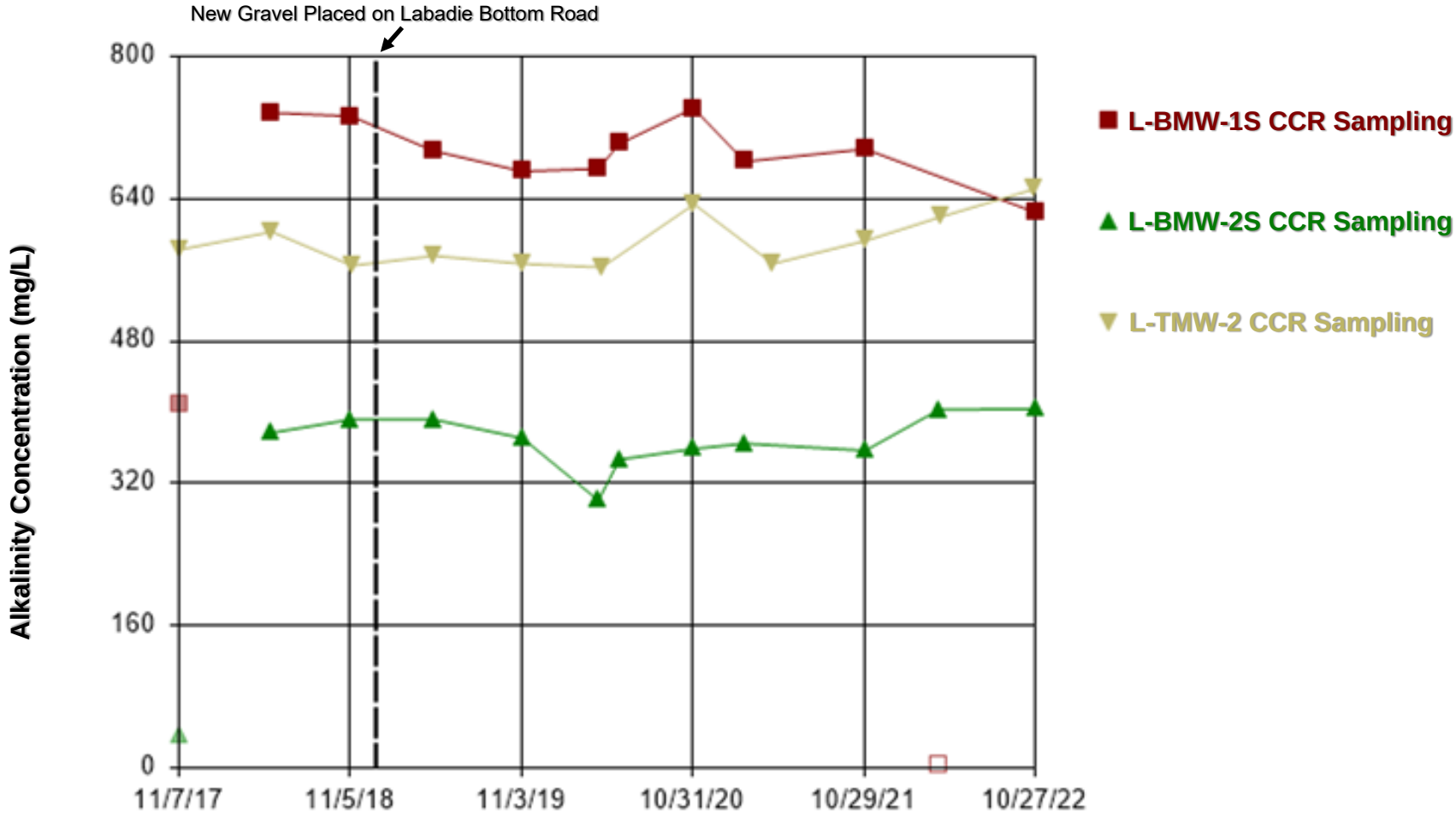
ROCKSMITH GEOENGINEERING



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

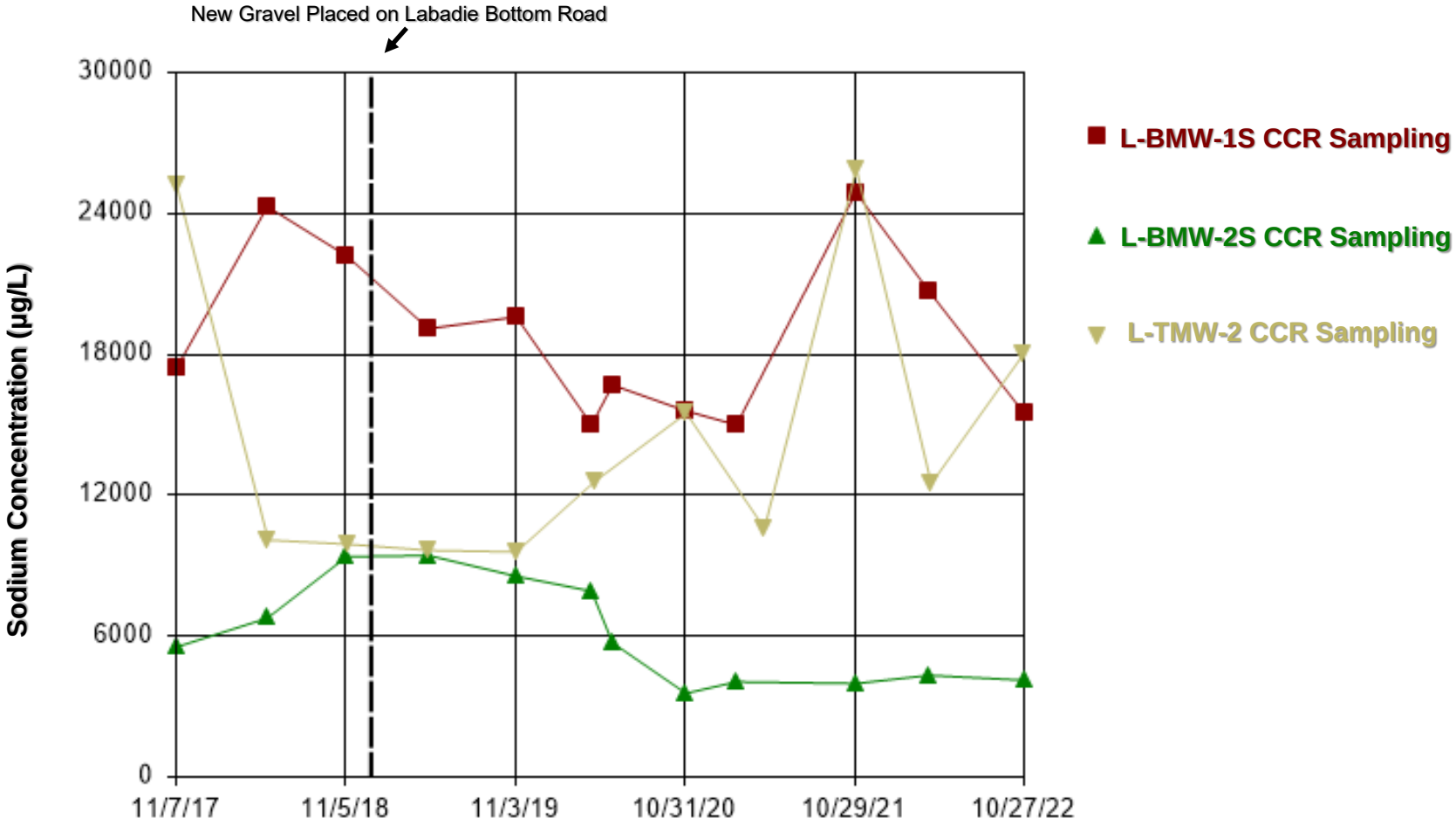
CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Magnesium Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-23	NA	23007	7

ROCKSMITH GEOENGINEERING



Notes
1) mg/L – Milligrams per liter.
2) UWL – Utility Waste Landfill.
3) CCR – Coal Combustion Residuals.
4) Data points not connected to lines are considered outliers.
5) Non-detected concentrations are depicted as unfilled points.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Alkalinity Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-23	NA	23007	8



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

CLIENT/PROJECT				TITLE
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Sodium Concentrations at TMW-2 and Background Monitoring Wells
DRAWN	CHECKED	REVIEWED	DATE	Rev No. / JOB NO. / FIGURE
JSI	JSI	MNH	2023-03-23	NA / 23007 / 9

ROCKSMITH GEOENGINEERING

LEGEND

Monitoring Well TMW-2

Labadie Bottom Road, Fresh Gravel Placed Late 2018- Early 2019

Gravel Parking Area, April 2016 - Late 2016

LCL1 FCM and Gravel Roads, Built 2015 - October 2016

0 200 400

Feet

NOTE(S)

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. FCM - FARIC-FORMED ARTICULATED CONCRETE MAT.

REFERENCE(S)

1. LCL1 ALTERNATIVE SOURCE DEMONSTRATION (ROCKSMITH, 2023).

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

CONSULTANT
ROCKSMITH GEOENGINEERING

YYYY-MM-DD	2023-03-17
DESIGNED	JSI
PREPARED	JSI
REVIEWED	JSI
APPROVED	MNH

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
AERIAL MAP OF FRESH GRAVEL PLACEMENT NEAR MONITORING WELL TMW-2

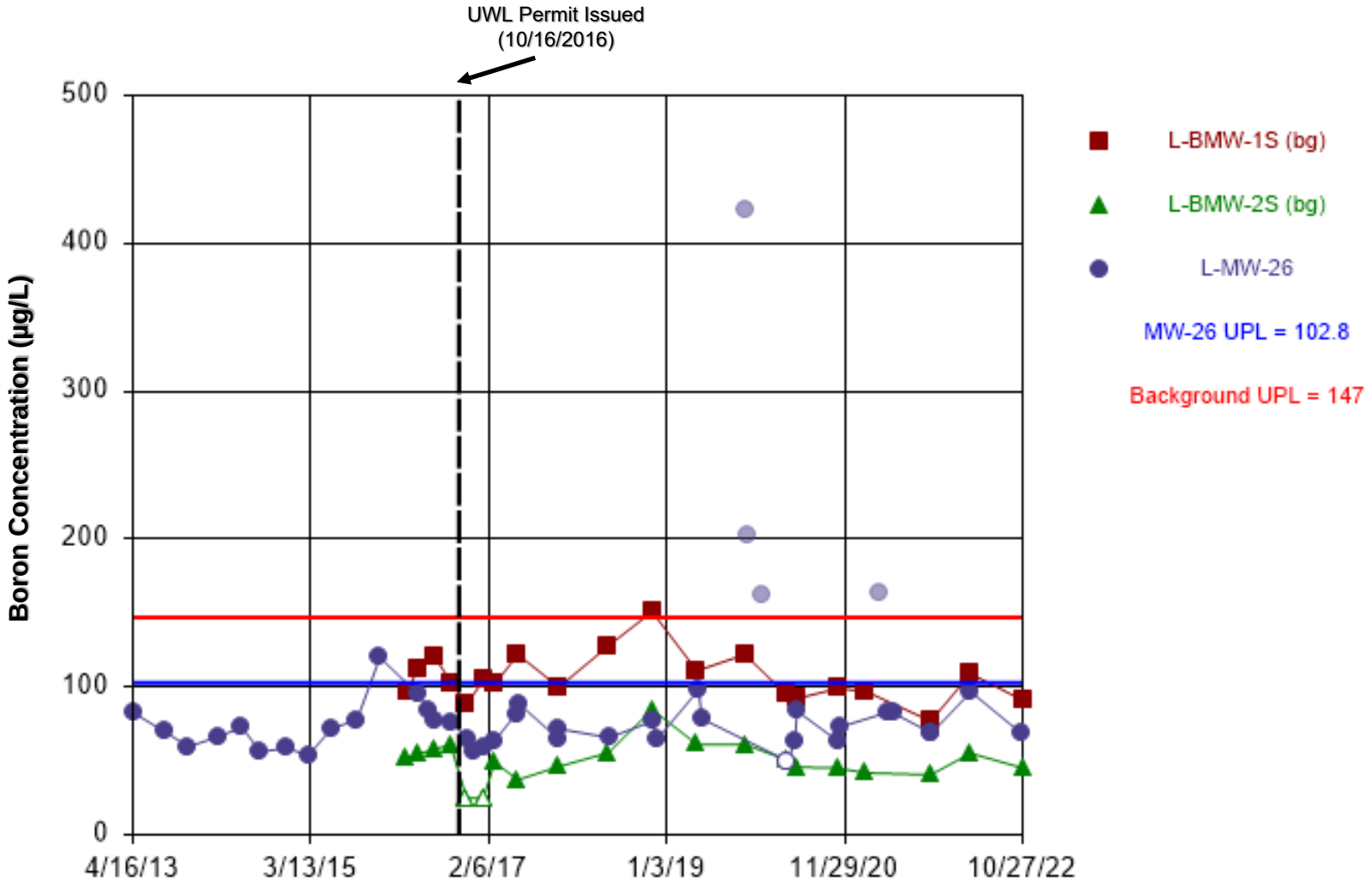
PROJECT NO.
23007

FIGURE
10

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

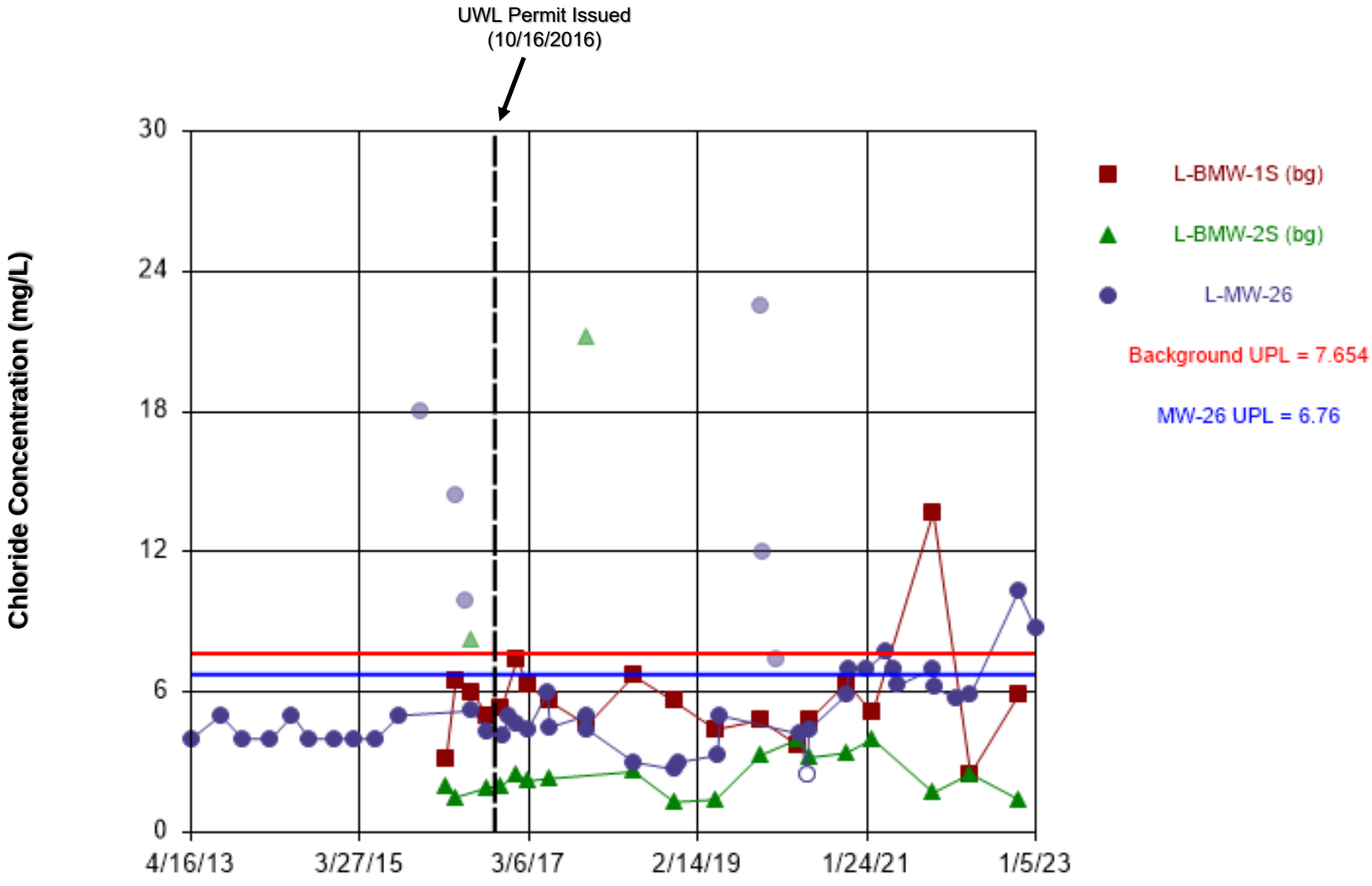
1 in

0



Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.
6) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Boron Concentrations at MW-26 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-23	NA	23007	13



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.
6) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **LABADIE ENERGY CENTER**				**Timeseries Plot of Chloride Concentrations at MW-26 and Background Monitoring Wells**		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	JSI	MNH	2023-03-24	NA	23007	**14**

Appendix C

Alternative Source Demonstration - May 2023 Sampling Event

REPORT

LCL1 – Alternative Source Demonstration

Labadie Energy Center, Franklin County, Missouri, USA

December 26, 2023

Project Number: 23007

Submitted to:

Ameren Missouri
1901 Chouteau Ave,
St. Louis, MO 63103

Submitted by:

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

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TABLES

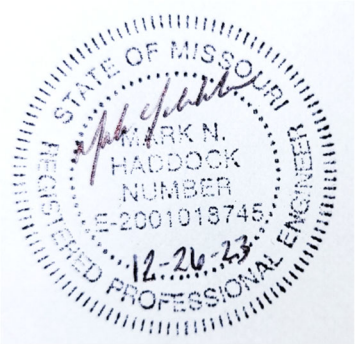
FIGURES

Certification Statement

This *LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule under the direction of a licensed professional engineer with Rocksmith Geoengineering, LLC.

I hereby certify that this *LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA* 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

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this LCL1 – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for a Statistically Significant Increase (SSI) calculated at Ameren Missouri's (Ameren) Labadie Energy Center (LEC), Utility Waste Landfill (UWL) LCL1, or Cell 1. This document satisfies the requirements of §257.94(e)(2) which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

2.0 SITE DESCRIPTION AND BACKGROUND

The LEC is located approximately 35 miles west of downtown St. Louis in Franklin County, Missouri, just south of the Missouri River. **Figure 1** depicts the site location and layout, including the location of LCL1. The LEC encompasses approximately 2,400 acres and is located within the Missouri River Valley. The facility is bounded to the north by the Missouri River, to the west by Labadie Creek, to the northeast and east by agricultural land, and to the south by a railroad line and bedrock bluffs.

2.1 Geological and Hydrogeological Setting

The site lies in a low-lying agricultural field area called the "Labadie Bottoms" that is between the Missouri River (to the north) and bedrock bluffs (to the south). Flow and deposition from the Missouri River have resulted in thick alluvial deposits that lie on top of bedrock. These alluvial deposits, which can range from approximately 90 to 120 feet in thickness, comprise the uppermost aquifer. Overall, this alluvial aquifer is described as a fining-upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Based on drilling records, the alluvial aquifer is divided into sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region consists of Ordovician-aged rock. Formations include primarily limestone, dolomite, sandstone, and shale and are comprised of the Plattin Group, Joachim Dolomite, St. Peter Sandstone, Powell Dolomite, and the Cotter/Jefferson City Dolomites.

2.2 Utility Waste Landfill Cell 1 – LCL1

UWL Cell 1 is referred to by Ameren as the LCL1, or Cell 1. The LCL1 is approximately 31 acres in size and is located east of the generating plant (**Figure 1**). The CCR Unit manages CCR from the LEC and is permitted to accept fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels. Currently, the LCL1 is used for the dry disposal of fly ash and bottom ash from the LEC.

The LCL1 was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by a 60-mil High Density Polyethylene (HDPE) geomembrane liner. Information on the design of the UWL is available in the 2013 Proposed Construction Permit application (Gredell and Reitz & Jens, 2013).

A groundwater monitoring well network was installed in 2013 and 2014 to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of 36 monitoring wells surrounding the current and future extents of the UWL (**Figure 1**). Most of these monitoring wells are screened in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for groundwater. Three monitoring wells [MW-33(D), MW-34(D), and MW-35(D)] are installed in the intermediate/deeper zones of the alluvial aquifer. Groundwater samples have been collected in most of these monitoring wells since April 2013 and tested for the MDNR UWL parameters. In April 2017, four monitoring wells were installed and added to this network along Labadie Bottom Road (S-1, S-2, S-3, and S-4).

The permit for the LCL1 was issued October 27, 2016 (permit #0907101). Eleven sampling events were performed prior to October 27, 2016 at most of the state required UWL monitoring wells, and four rounds of

baseline CCR Rule sampling were completed at CCR Rule monitoring wells (discussed below). These results represent groundwater quality prior to CCR placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

2.3 CCR Rule Groundwater Monitoring

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

The groundwater monitoring system for the LCL1 consists of six monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Two existing monitoring wells (MW-26 and TMW-1) were installed by Reitz & Jens, Inc. in 2013 as a part of the state UWL monitoring program. The remaining monitoring wells (TMW-2, TMW-3, BMW-1S, and BMW-2S) were installed by Golder Associates Inc. (Golder) in 2015 and 2016 for CCR Rule groundwater monitoring purposes. More information regarding the design and installation of the monitoring wells is provided in the LCL1 GMP (Golder, 2017) and the LCL1 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight baseline sampling events were completed for the LCL1. After baseline sampling, Detection Monitoring events have been completed twice a year generally once in Q2 and once in Q4. April 2022 was the last Detection Monitoring sampling event. Laboratory testing was performed for the following Appendix III constituents during each Detection Monitoring event:

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

Background results from the eight baseline sampling events were used to calculate statistical upper prediction limits (UPL). These UPLs were then compared to the Detection Monitoring results. If the result from the current Detection Monitoring event was higher than the calculated UPL, the result was considered an initial exceedance, and verification sampling was performed in accordance with the LCL1 statistical analysis plan. Per the statistical analysis plan, after the May 2019 sampling event, the UPLs were updated to incorporate results from four (4) of the Detection Monitoring events. The UPLs were updated again following the April 2021 sampling event after an additional four Detection Monitoring events were completed.

Since November 2017, several ASDs have been prepared for SSIs identified at wells MW-26, TMW-1, and TMW-2. These previous ASDs are available in the 2018 through 2022 Annual Reports for the LCL1 and are available on Ameren's publicly available CCR Compliance website[1]. These ASDs have demonstrated that previous SSIs at the site were not caused by the LCL1 and were primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer or were caused by the LCL1's location being downgradient from the LCPA, which is currently in corrective action. Additionally, soluble salts associated with the gravel and concrete construction of the LCL1 display an increase in constituent

[1] Website is available at: https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports

concentrations that correlate with the time of placement of road gravel and LCL1 construction activities and the net shallow groundwater movement at the site.

In May 2023, initial exceedances were identified for sulfate and TDS at TMW-2, TDS at TMW-1, and chloride, sulfate, and TDS at MW-26. Verification sampling results confirmed exceedances for chloride at MW-26, as well as sulfate and TDS at TMW-2. Results from this sampling event are provided in **Table 1**.

2.4 Review of the Statistically Significant Increases

The SSIs for sulfate and TDS occurred at monitoring well TMW-2 and the SSI for chloride occurred at MW-26. Values from the May 2023 sampling event and subsequent July-August 2023 verification sampling are presented on **Table 1**. These monitoring wells are screened in the upper portion of the alluvial aquifer, just below the average seasonal low for groundwater. As shown on **Figure 1**, TMW-2 is located to the northeast of the LCL1, and MW-26 is located west of the LCL1. Both wells are east of the generating plant as well as surface impoundments LCPA and LCPB. Closure of these CCR Units was substantially completed before the April 2021 sampling event, with the completion of the liner cover system on December 30, 2020.

Based on review of the pre-disposal data discussed in Section 2.2 above, as well as our comparison of the pre-disposal data with the results from the eight CCR-Rule baseline events, the groundwater at the LCL1 contains low-level, pre-existing CCR impacts from units/activities that pre-dated disposal activities in the LCL1. As a result of these pre-existing impacts, the LCL1 statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from background wells, such that individual limits are calculated for each constituent in each well in the monitoring program.

3.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Multiple lines of evidence indicate that the SSIs are not the result of a release from the LCL1 but are rather from an alternative source. The following bullets summarize the different lines of evidence that support this ASD:

- Pre-existing, low level concentrations of CCR impacts in groundwater that pre-date the installation and operation of the LCL1.
- Construction of the LCL1 with a 60-mil high density polyethylene (HDPE) geomembrane liner and a 2-foot thick clay barrier near TMW-2.
- Location near fresh limestone and dolomitic gravels, and the potential geochemical influence from the LCL1 gravel construction materials and parking lot/road salting on shallow groundwater.
- Lack of increasing concentrations of the key CCR Indicator (boron) in monitoring wells with SSIs.

3.1 CCR Indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 2** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 2: Types of CCR and Typical Indicator Parameters

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Fly Ash	Fine grained, powdery material composed mostly of silica made from the burning of finely ground coal in the boiler.	• Boron • Molybdenum • Lithium

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

Notes:

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

As described above, the LCL1 has historically received fly ash. No FGD type wastes are managed at the LEC.

3.2 Evaluation of SSIs at TMW-2

3.2.1 Boron Concentrations

As indicated in **Table 2**, boron is a key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present at relatively high concentrations in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). This non-reactive and mobile nature makes boron an early and key indicator of impacts from a CCR Unit. Boron is also present in the monitoring wells around the LCPA and has been shown to be a key indicator for CCR impacts at this site. Therefore, if groundwater was impacted by the LCL1, current boron concentrations should be statistically elevated with respect to pre-CCR placement downgradient of the LCL1.

Figure 2 displays boron concentrations at TMW-2 as well as the two shallow background wells for the LEC for the entire historical monitoring period. At TMW-2, boron concentrations have varied over time with values ranging from 86.8 J to 132 micrograms per liter (µg/L). The intrawell UPL for boron at TMW-2 is 134.3 µg/L. Throughout this same timeframe, boron concentrations in the background wells BMW-1S and BMW-2S, which have no pre-existing CCR impact and are located approximately 2.5 miles to the west of the LCL1, have had values ranging between non-detect (< 50 µg/L) to 151 µg/L. The interwell UPL for boron (based on shallow LEC background wells) is 141.2 µg/L.

As displayed in **Figure 2**, the most recent boron concentration at TMW-2 (109 µg/L) is below the UPL for both TMW-2 and the background monitoring wells and is consistent with previous results. The absence of boron exceedances and lack of an increasing trend of boron at TMW-2 demonstrates that elevated concentrations for other constituents come from an alternative source, rather than LCL1 CCR.

3.3 Constituents of Interest (COI) at TMW-2

As discussed in Section 3.0, there are three verified SSIs from the May 2023 sampling event, two of which are at monitoring well TMW-2, including sulfate and TDS (referred to hereafter as the Constituents of Interest or COIs). To determine the source for the recent exceedances for the COIs, values were compared to background and different source water datasets. **Figures 3** to **9** are timeseries plots displaying the concentrations of the COIs compared to shallow background concentrations from background wells located 2.5 miles upgradient of the LCL1. As displayed on these figures, there is an increase in each of the COIs since April 2021, however, as discussed in

section 3.2, the absence of boron with the other exceedances indicates that it is unlikely that these low-level SSIs are caused by CCR impacts.

Table 3 below displays concentration data for the COIs as well as major cations and anions from the May 2023 and July-August 2023 sampling events as compared with the CCR porewater concentrations from the LCPA (contains bottom ash and fly ash) and the LCPB (contains fly ash).

Table 3: Comparison of TMW-2 and Porewater Concentrations for Contaminants of Interest

Constituent (Units)	May 2023 Result at TMW-2	July-August 2023 Result at TMW-2	LCPA Porewater Range	LCPB Porewater Range
Calcium (µg/L)	204,000	Not Sampled	76,500 – 106,000	11,400 – 22,600
Chloride (mg/L)	7.1	Not Sampled	15.2 – 25.5	15.6 – 18.4
Sulfate (mg/L)	123	257	254 – 306	728 – 1,060
Total Dissolved Solids (mg/L)	981	1,100	528 – 642	1,860 – 2,850
Magnesium (µg/L)	54,700	Not Sampled	184 – 45,500	84.4 – 386
Alkalinity (mg/L)	641	Not Sampled	77.6 – 208	861 – 1,340
Sodium (µg/L)	11,700	Not Sampled	50,500 - 84,000	750,000 – 969,000

Notes:
1) µg/L – Micrograms per liter.
2) mg/L – Milligrams per liter.

As displayed in **Table 3**, porewater samples collected from the LCPA and LCPB CCR units indicate that CCR is not a potential source for increases in calcium or magnesium at TMW-2, as the concentrations in porewater are lower than those found in groundwater at TMW-2. This, combined with a lack of increased boron concentrations, the key CCR indicator, indicates that an alternative source is responsible for exceedances present at TMW-2.

3.3.1 Nearby Carbonate Gravel Roadways and Concrete Construction as Potential Source

In addition to the lines of evidence presented above, the recent placement of fresh, crushed limestone ($CaCO_3$)/dolomite ($CaMg(CO_3)_2$) gravel and concrete near well TMW-2 is a potential source of the elevated COI concentrations reported in the shallow well TMW-2. As displayed in **Figure 10**, the area around TMW-2 has had a significant amount of construction activity during the past several years associated with LCL1 construction, and fresh limestone and dolomite gravels, as well as concrete, have been placed near TMW-2 in the following locations:

1) After construction of the LCL1, Labadie Bottom Road was re-graded and fresh, crushed gravel was placed on the road in late 2018 to early 2019. TMW-2 is located approximately 30 feet south and east of the new gravel roads as displayed in **Figure 10.**

2) The LCL1 Cell was constructed between 2015 and October 2016 and is constructed with gravel roads at the top of the unit, gravel beneath the fabric-formed articulated concrete mat (FCM) side slopes of the unit, and a gravel road at the base of the LCL1 as displayed in **Figure 10**. TMW-2[2] is approximately 145 feet from the

[2] The location of TMW-2 is as close as was feasible to the LCL1 as site conditions allowed in 2016 to comply with the timeframes of the CCR Rule. Construction activities associated with the LCL1 and a nearby gas pipeline made it so the closest practicable location for TMW-2 was ~145 feet from the toe of the berm at the LCL1.

toe of the berm. Based on aerial imagery and photographs, completion of the FCM and gravel road began in April 2016 and was completed by October 2016.

3) During the construction of the LCL1, fresh limestone/dolomite gravel was placed just to the east of the LCL1 and ~50 feet west of TMW-2. This gravel area was used as a parking area for construction and as a staging and laydown area for equipment. Based on onsite photos and aerial imagery, the gravel area was built in April 2016, and was removed after completion of the LCL1, in late 2016. The parking area is approximately 50 – 125 feet to the west/southwest of TMW-2. An image displaying the north end of the parking area is provided in **Figure 11**.

Figure 11 - North Area of LCL1 Construction Parking

The gravel used for the roadways, under the FCM, and parking lots nearby consists mostly of limestone and dolomite and contains some calcite sourced from nearby quarries. Precipitation and infiltration of surface water through fresh gravel, salting of gravel and road surfaces, and concrete that contains water-soluble salts leach soluble components into the shallow groundwater and can cause an increase in the COIs observed in TMW-2.

The potential impact of carbonate rocks and their associated water-soluble salts has been studied since the 1950s, and Lamar and Shorde (1953) determined that soluble salts in dolomite and limestone commonly contain increased amounts of magnesium, bicarbonate (alkalinity), chloride, calcium, and sulfate. Numerous studies and geochemistry textbook citations since that time have confirmed these findings. Concrete is also known to contain water-soluble salts (Cheng et al., 2013) similar to those discussed for carbonate gravels with increased levels of calcium, chloride, and sulfate. The leaching of these salts from concrete is called efflorescence, and it can be common in the concrete construction industry. Efflorescence, the migration of salts to the surface, is typically described as a whitish colored powder that coats the surface of the concrete. As with the carbonate gravels, precipitation and runoff of surface water from the concrete FCM and associated water-soluble salts leaches soluble components into the shallow groundwater and can cause an increase in the COIs observed in TMW-2.

3.3.2 Hydraulic Connection Between Potential Fresh Carbonate Gravel/Concrete Sources and TMW-2

As discussed in the 2022 LCL1 Annual Report (WSP, 2023), net groundwater flow at the site is estimated to be approximately 18 feet per year from the bluffs to the south to the Missouri river to the north. Groundwater flow direction at the site varies slightly over time, but flow to the north/northeast is observed under normal river conditions. Based on the net groundwater flow, both the former gravel parking and laydown area associated with the construction of the LCL1, and the gravel roads and exposed FCM concrete/berm associated with the finished LCL1 cell are likely sources for COI impacts at TMW-2. Diffusion and dispersion of COIs in the groundwater may also facilitate impacts observed at TMW-2 due to its close proximity to the LCL1 construction activities.

The FCM and the gravel road at the top of the berm around the LCL1 were placed on top of compacted earth fill and were sloped to drain surface water toward the gravel road at the toe of the berm, surrounding the LCL1 (Gredell and Reitz & Jens, 2013). Historical aerial images (See **Figure 12** In text) display that the surface water runoff from the FCM is occurring as designed with some pooling of surface water below the berm and is causing increased infiltration over the former gravel area. As discussed above, the water that is infiltrating into the groundwater will have leached available water-soluble salts from the FCM concrete and the underlying carbonate gravel/rock base.

Figure 12 – Historic Aerial Images near TMW-2

Notes:

1) Aerial images from Google Earth ®

As discussed above, the FCM, gravel roads associated with the UWL, and the gravel area located just west of TMW-2 were built between April and October 2016. These potential upgradient leaching sources are located approximately 50 to 145 feet upgradient of TMW-2. Based on the net groundwater flow rate (~18 feet per year average), leaching impacts from these carbonates and associated salt sources would be expected to reach well TMW-2 between 2019 and 2024.

As displayed in **Figure 3**, calcium concentrations at TMW-2 display an overall increasing trend since April 2020, however concentrations of major cations and anions appear to be lower in the May 2023 sampling event. This corresponds with the date range that would be expected for impacts caused by the leaching of the water-soluble salts associated with the fresh carbonate gravel/rock placement during the LCL1 construction and adjacent parking area construction. Additionally, CCR placed in the LCL1 is not a potential source for increases in calcium at TMW-2, as the concentrations in CCR porewater at LEC are lower than those found in groundwater at TMW-2 and in the background wells. Therefore, leaching of the gravel and concrete water-soluble salts provides the most likely explanation for the increase in calcium concentrations at TMW-2, as fresh carbonates have been demonstrated to cause increases to calcium concentrations to groundwater (Lamar and Shorde, 1953) and the potential carbonate source is upgradient and hydrologically connected to TMW-2.

In addition to calcium impacts, magnesium, alkalinity, chloride, sulfate, sodium, and TDS display very similar trends to calcium (see **Figures 4-9**), with increasing concentrations in the same timeframe. Increases in these constituents, especially those that are not a result of CCR influence (i.e., calcium, magnesium, alkalinity, as shown in **Table 3**), coupled with a lack of increasing boron, indicates that these impacts are not from CCR influence on the groundwater, but are most likely related to leaching of fresh carbonate gravel and concrete and their associated soluble salt sources.

Lastly, the documented construction of the LCL1 with a robust, engineered base liner system constructed of 2 feet of low-permeability compacted clay overlain by a 60-mil high HDPE liner, also limits the potential that the May 2023 SSIs reported for TMW-2 are a result of influence from the LCL1. These lines of evidence collectively indicate that the SSIs observed in TMW-2 are not the result of CCR impacts from the LCL1.

3.4 Evaluation of SSIs at MW-26

3.4.1 Boron Concentrations

As indicated in **Table 2**, boron is a key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present at relatively high concentrations in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012).

This non-reactive and mobile nature makes boron an early and key indicator of impacts from a CCR Unit. Boron is also present in the monitoring wells around the LCPA and has been shown to be a key indicator for CCR impacts at this site. Therefore, if groundwater was impacted by the LCL1, current boron concentrations should be statistically elevated with respect to pre-CCR placement downgradient of the LCL1.

Figure 13 displays boron concentrations at MW-26 as well as the two shallow background wells for the LEC for the entire historical monitoring period. At MW-26, boron concentrations have varied over time with values ranging from non-detect (<100 µg/L) to 120 µg/L, with several high outliers as discussed in the November 2019 and April 2021 LCL1 ASDs (ranging between 162 and 423 µg/L). The intrawell UPL for boron at MW-26 is 102.8 µg/L. Throughout this same timeframe, boron concentrations in the background wells BMW-1S and BMW-2S, which have no pre-existing CCR impact and are located approximately 2.5 miles to the west of the LCL1, have had values ranging between non-detect (<50 µg/L) to 151 µg/L. The interwell UPL for boron (based on LEC background wells) is 141.2 µg/L. As displayed in **Figure 13**, the most recent boron concentration at MW-26 (45.6 J µg/L) is well below the UPL for both MW-26 and the background monitoring wells and is consistent with previous results. The absence of boron exceedances and lack of increasing concentrations of boron at MW-26 demonstrates that elevated concentrations for other constituents are related to an alternative source, rather than the LCL1.

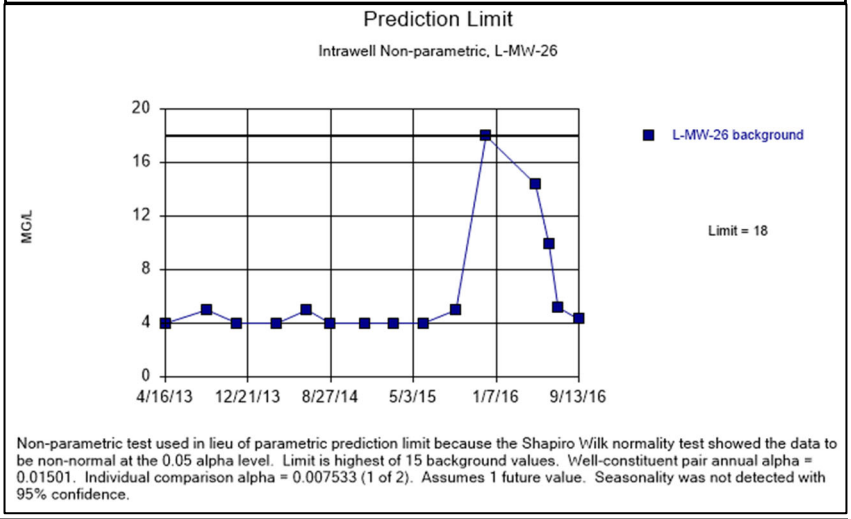
3.5 Chloride Concentrations at MW-26

Chloride is not listed in **Table 2** as an indicator of fly ash or boiler slag/bottom ash (EPRI 2012, EPRI 2017) because it typically has low concentrations in CCR leachate relative to typical background. It can be an indicator however, if concentrations in the source are higher than background levels. Chloride is typically a key indicator for FGD type wastes and is commonly found near salt and brine treated roadways where it can be a good indicator because it, like boron, has high mobility and low reactivity in most aquifer conditions. There is no FGD waste at the LEC, and fly ash or bottom ash/boiler slag are the typical wastes in the LCPA, LCPB, and LCL1.

As displayed in **Figure 14**, Chloride concentrations for the May 2023 sampling event and subsequent verification sampling event are 14.2 and 11.1 mg/L, respectively. The calculated UPL for MW-26 is 6.76 mg/L and the UPL for the shallow background monitoring wells located 2.5 miles upgradient of the LCL1 (BMW-1S and BMW-2S, used for LCPB interwell statistical evaluation) is 7.564 mg/L with two high outliers at 8.2 and 21.2 mg/L. MW-26 is west of the LCL1 (**Figure 1**) and near an access road intersection where road salting occurs in winter. As discussed in the 2022 Annual Report (WSP, 2023), groundwater flow in the area around MW-26 has a net flow toward the north/northeast for the past several years, making MW-26 an upgradient well to the LCL1. Therefore, a lack of elevation boron and the location of MW-26 indicate that the elevated concentrations of chloride at MW-26 are not from the LCL1, but rather come from an alternative source.

Prior to the placement of CCR in the LCL1 (prior to October 16, 2016) 15 samples were collected and tested for chloride at MW-26 from both the CCR Rule sampling and the State UWL sampling programs. During this timeframe, chloride concentrations ranged between 4 and 18 mg/L, with two results (18 on 12/8/15, and 14.4 on 5/5/16) higher than those from the May and July 2023 sampling events. As part of the statistical calculations for the UPLs for MW-26, these high results were considered outliers and were not incorporated into the calculation in order to normalize the data and to increase the statistical power of the UPL. If all the data was used prior to the placement of CCR in the LCL1, the calculated UPL would be 18 mg/L, as displayed in **Figure 15** (embedded in

Figure 15 – Pre-CCR UPL at MW-26



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 15 background values. Well-constituent pair annual alpha = 0.01501. Individual comparison alpha = 0.007533 (1 of 2). Assumes 1 future value. Seasonality was not detected with 95% confidence.

text). This is greater than chloride concentrations from the May and July 2023 sampling results.

Elevated chloride results prior to the placement of CCR In the LCL1 is not limited to MW-26. As displayed in **Figure 16**, 5 of the UWL monitoring wells (MW-26, MW-02, MW-07, MW-27, MW-28) had chloride values greater than the May 2023 result of 14.2 mg/L prior to the placement of CCR In the LCL1. These increased chloride results are not concentrated in one area of the UWL, indicating that chloride concentrations display geochemical variability across the site that pre-dates placement of CCR in the LCL1, especially near Labadie Bottom Road. Therefore, with no increase in boron concentrations, the elevated chloride at MW-26 is related to geochemical variability and pre-existing road salt impacts in the alluvial aquifer at the site.

4.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY LCL1 IMPACT

Based on the information presented above, the SSIs reported for TMW-2 during the May monitoring event are not a result of impacts from the LCL1. The SSIs appear to be a result of the limestone/dolomite gravel, parking lot/road salting, and leaching of concrete placed upgradient of TMW-2 that has migrated downgradient into shallow groundwater to TMW-2. Soluble salts associated with the gravel and concrete (calcium, chloride, sulfate, magnesium, alkalinity, and TDS) display an increase in concentration that correlates with the time of placement and LCL1 construction activities and the net groundwater movement at the site. These trends, coupled with the lack of boron increases and robust engineered construction of the LCL1, indicate that the changes in concentration are not caused by the LCL1, but rather the upgradient gravel and exposed concrete materials and their use in LCL1 construction.

At MW-26, the chloride SSI from the May 2023 sampling event is not a result of impacts from the LCL1 and is the result geochemical variability in the alluvial aquifer and pre-existing road salt impacts. Prior to placement of CCR in the LCL1, higher chloride concentrations have been observed in MW-26 and surrounding UWL monitoring wells compared with results from May and July 2023. This historical variability along with a lack of elevated boron at MW-26 demonstrates that the elevated chloride results are not from impacts from the LCL1.

5.0 REFERENCES

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Tables

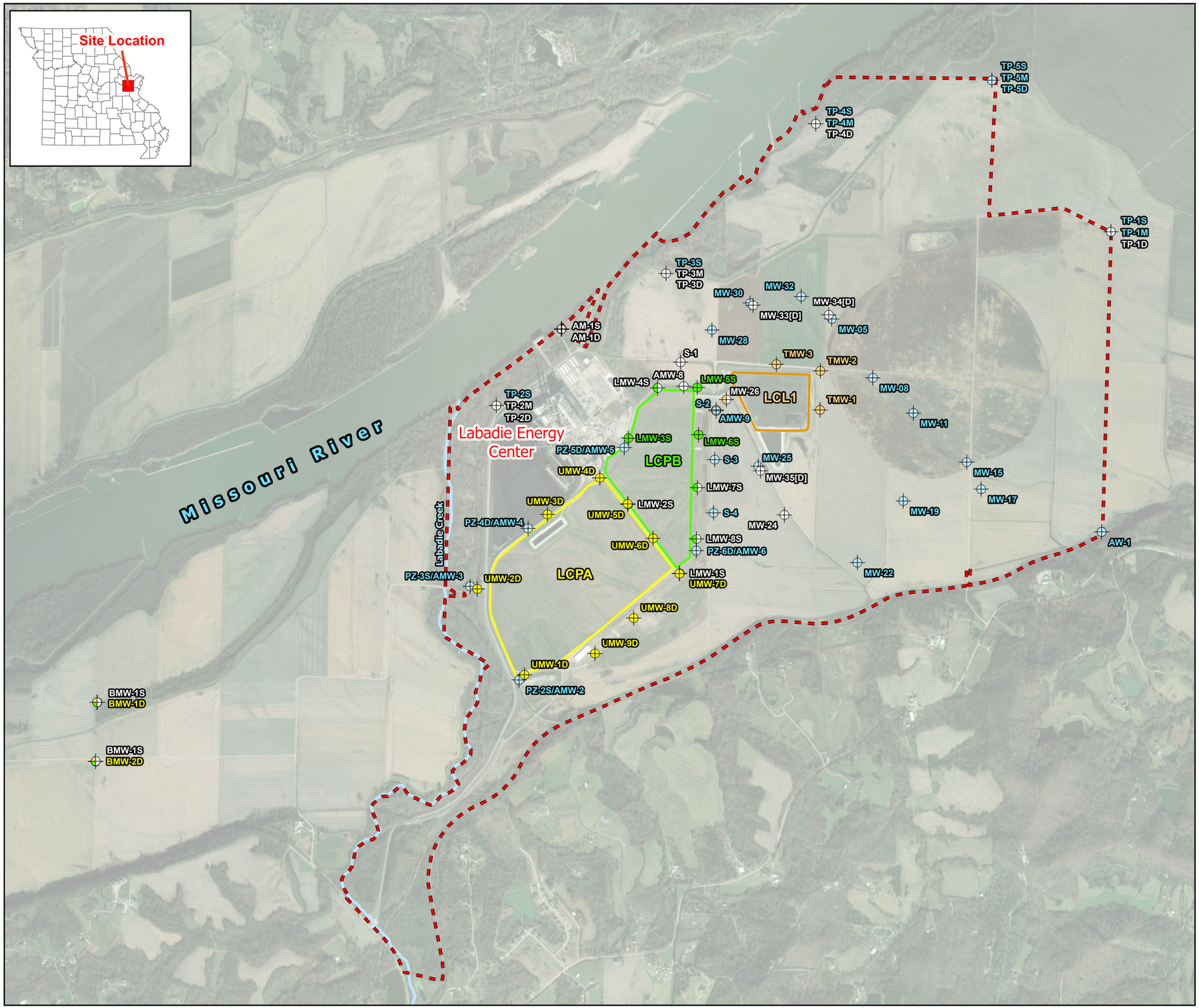
Table 1
May 2023 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
May 2023 Detection Monitoring Event											
DATE	NA	5/11/2023	5/11/2023	NA	5/18/2023	NA	5/16/2023	NA	5/16/2023	NA	5/16/2023
pH	SU	6.76	7.03	6.658-7.339	7.01	6.683-7.105	6.91	6.42-7.17	6.89	6.585-7.07	6.97
BORON, TOTAL	µg/L	88.2 J	45.3 J	102.8	45.6 J	121.6	103	134.3	109	136.9	94.3 J
CALCIUM, TOTAL	µg/L	191,000	141,000	155,150	140,000	183,389	163,000	205,487	204,000	202,001	122,000 J
CHLORIDE, TOTAL	mg/L	6.6	2.2	6.76	14.2	5.718	3.9	7.142	7.1	8.621	1.5
FLUORIDE, TOTAL	mg/L	ND	ND	0.2118	ND	0.2975	0.15 J	0.2972	0.17 J	0.2626	0.13 J
SULFATE, TOTAL	mg/L	65.9	39.7	38.24	44.4	128	50.5	115.5	123	104	27.2
TOTAL DISSOLVED SOLIDS	mg/L	801	607	543.7	549	733.7	771 J	815.4	981	815.4	512
July-August 2023 Verification Sampling Event											
DATE	NA				7/13/2023		7/13/2023		8/1/2023		
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L				11.1						
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L				34.1 J				257		
TOTAL DISSOLVED SOLIDS	mg/L				533		602		1100		

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 were tested during Verification Sampling.

Prepared By: GTM
Checked By: JSI
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

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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	2023-03-18
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:

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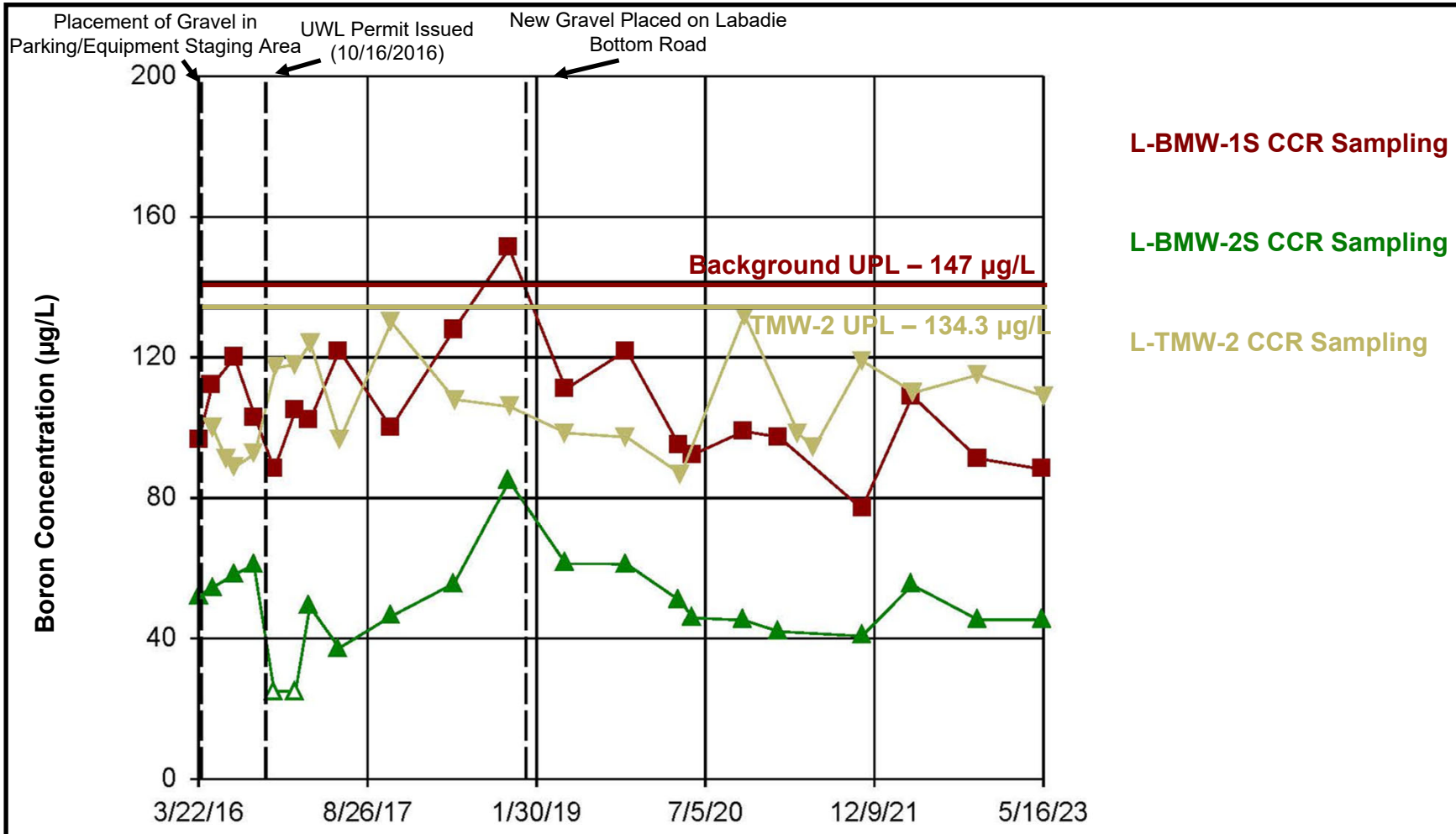
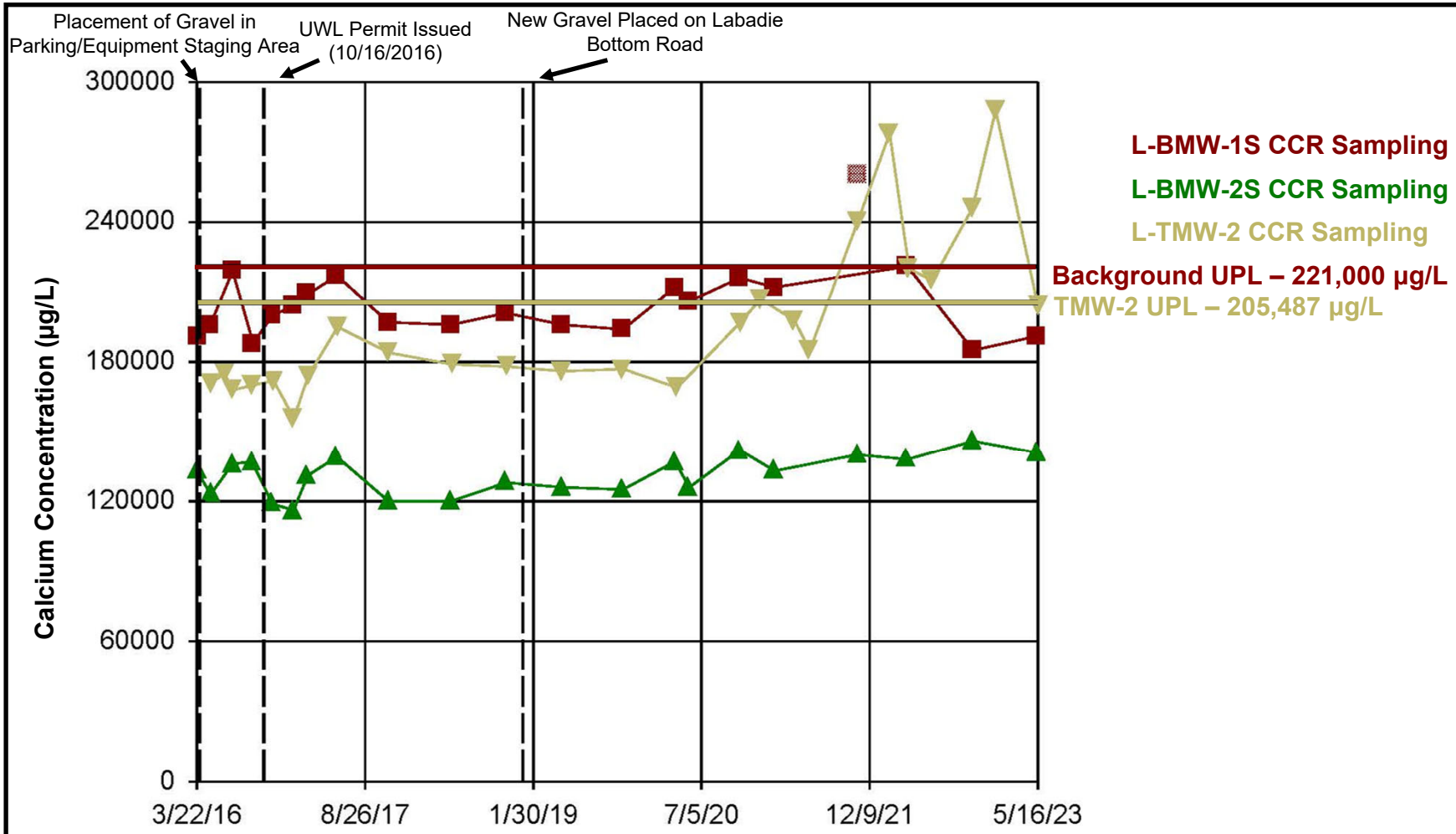
Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.1-LEC\4.1.2 - Production\Other Maps\Annual Report Figure 1.aprx



Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Boron Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-12-11	NA	23007	2

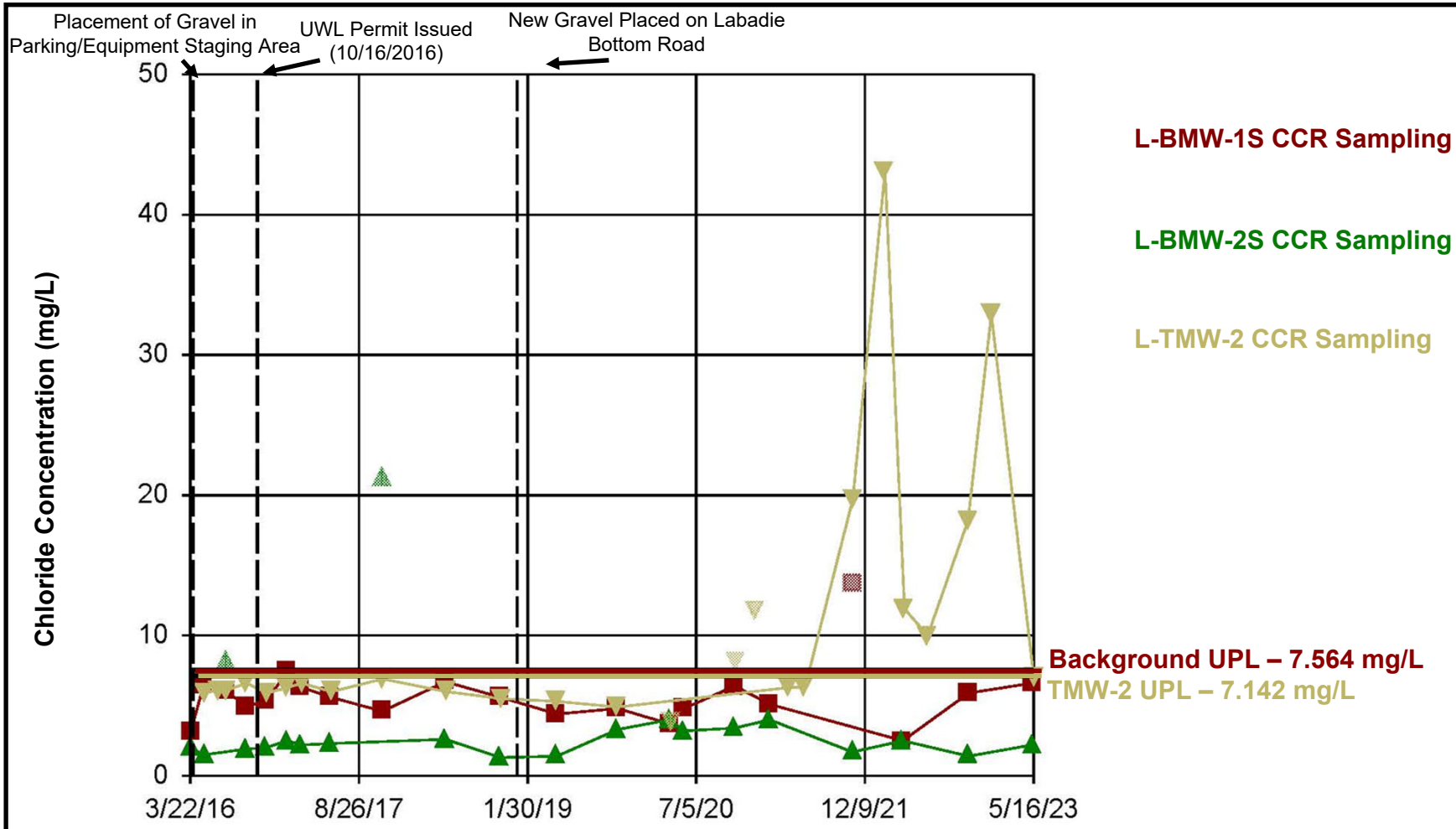
ROCKSMITH GEOENGINEERING



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

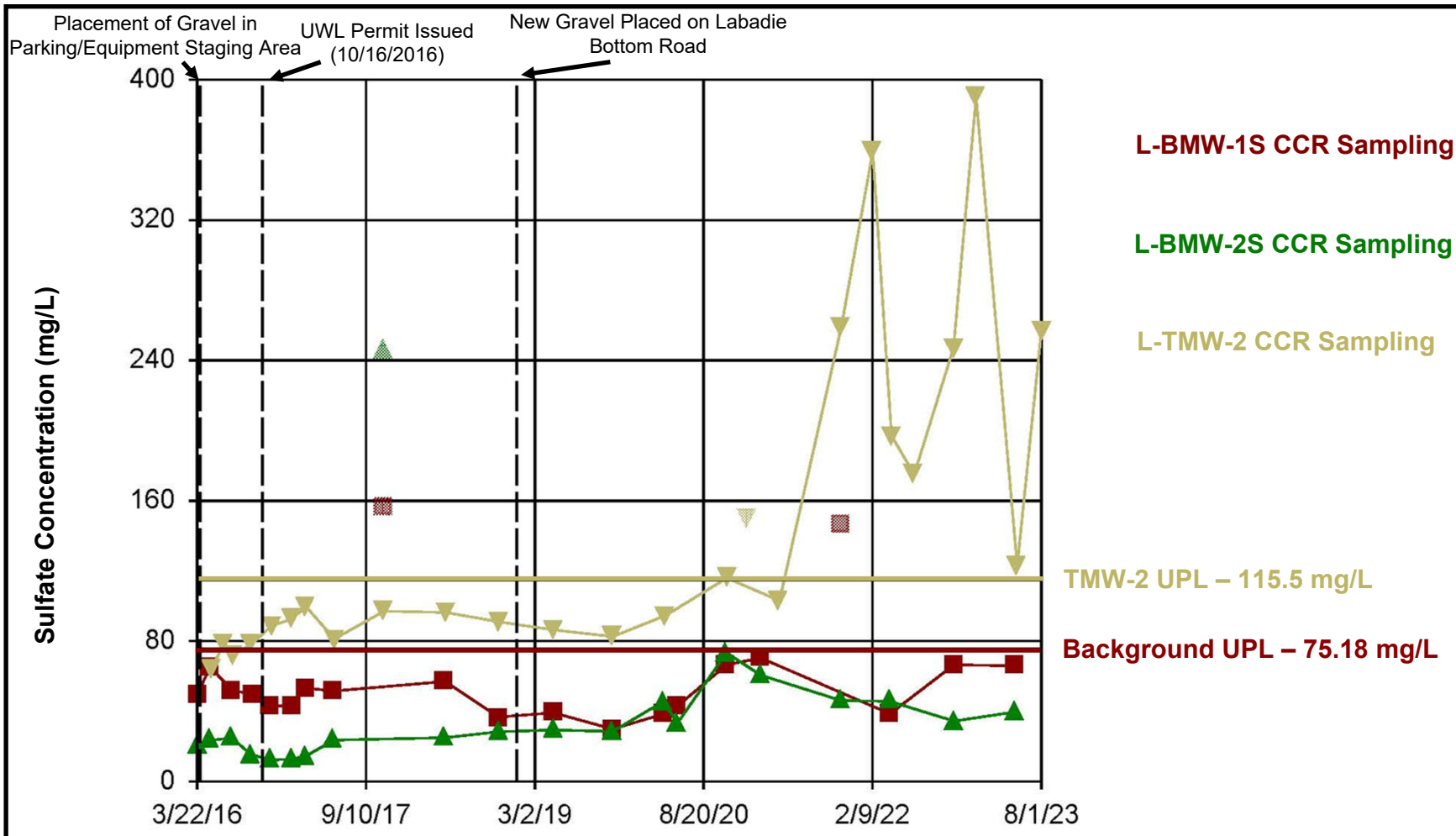
CLIENT/PROJECT				TITLE
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Calcium Concentrations at TMW-2 and Background Monitoring Wells
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2023-12-11	Rev No. NA / JOB NO. 23007 / FIGURE 3

ROCKSMITH GEOENGINEERING



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Data points not connected to lines are considered outliers.

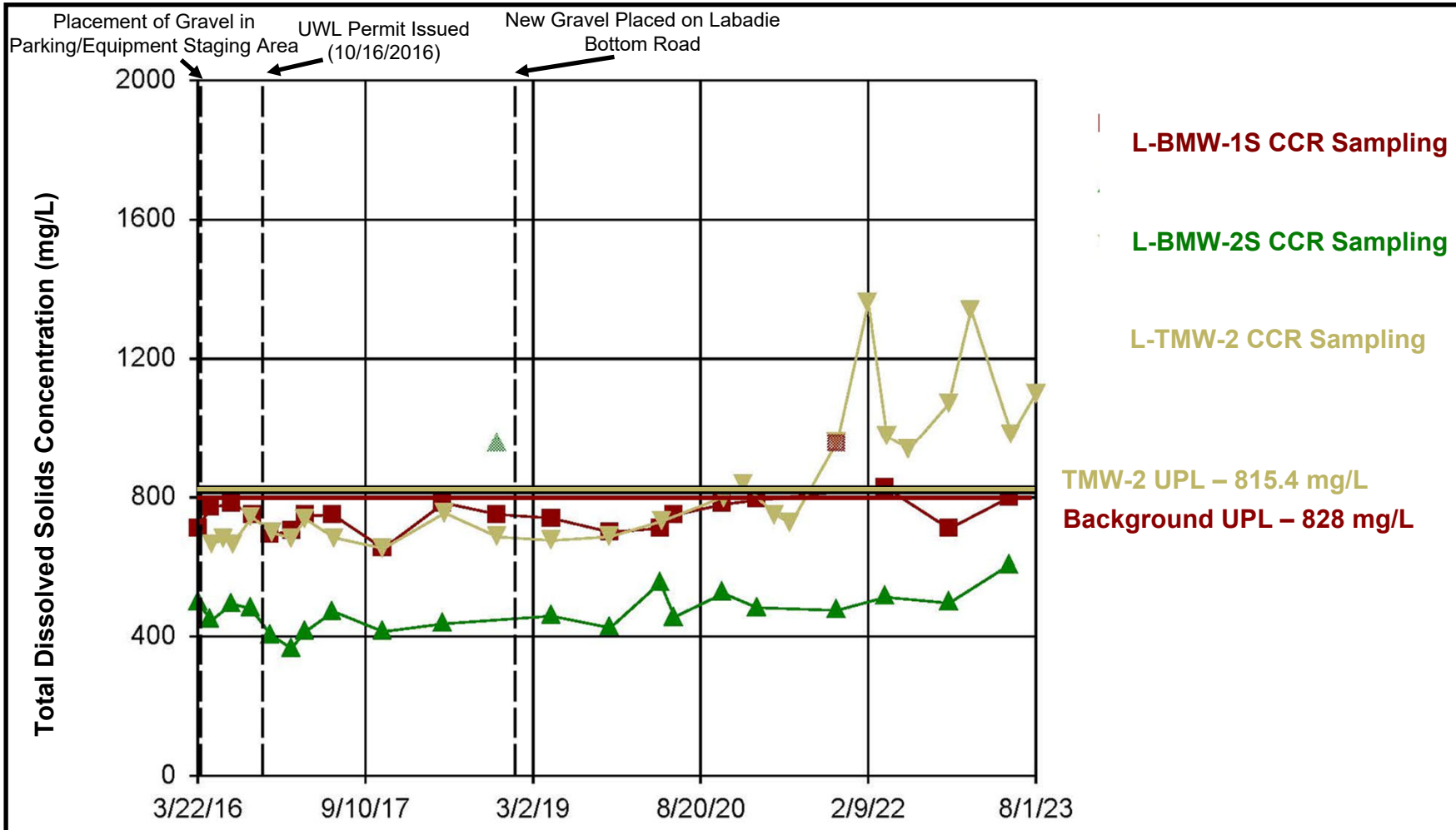
CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Chloride Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-12-11	NA	23007	4



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Sulfate Concentrations at TMW-2 and Background Monitoring Wells
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2023-12-11	Rev No. NA / JOB NO. 23007 / FIGURE 5

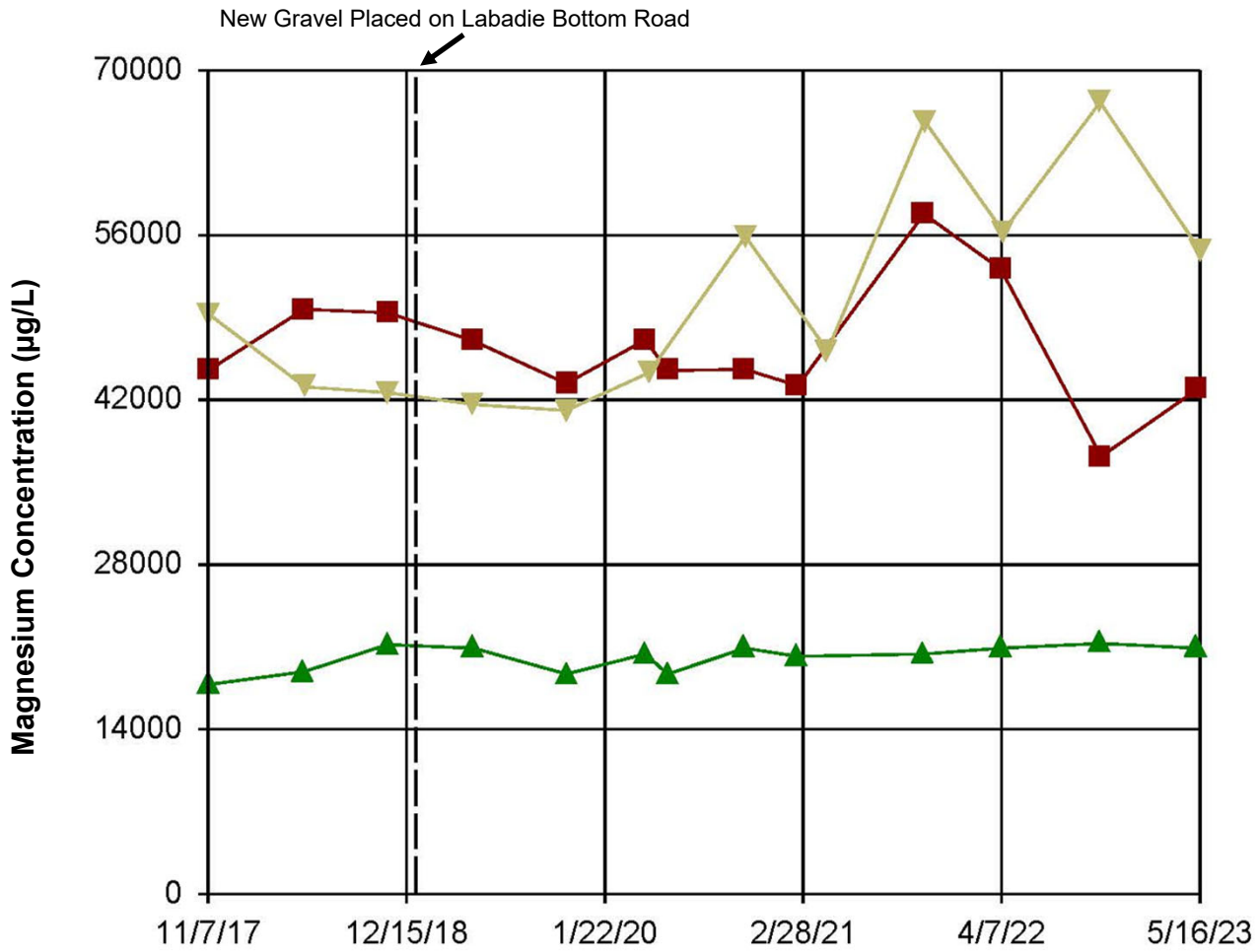
ROCKSMITH GEOENGINEERING



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Total Dissolved Solids Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-12-11	NA	23007	6

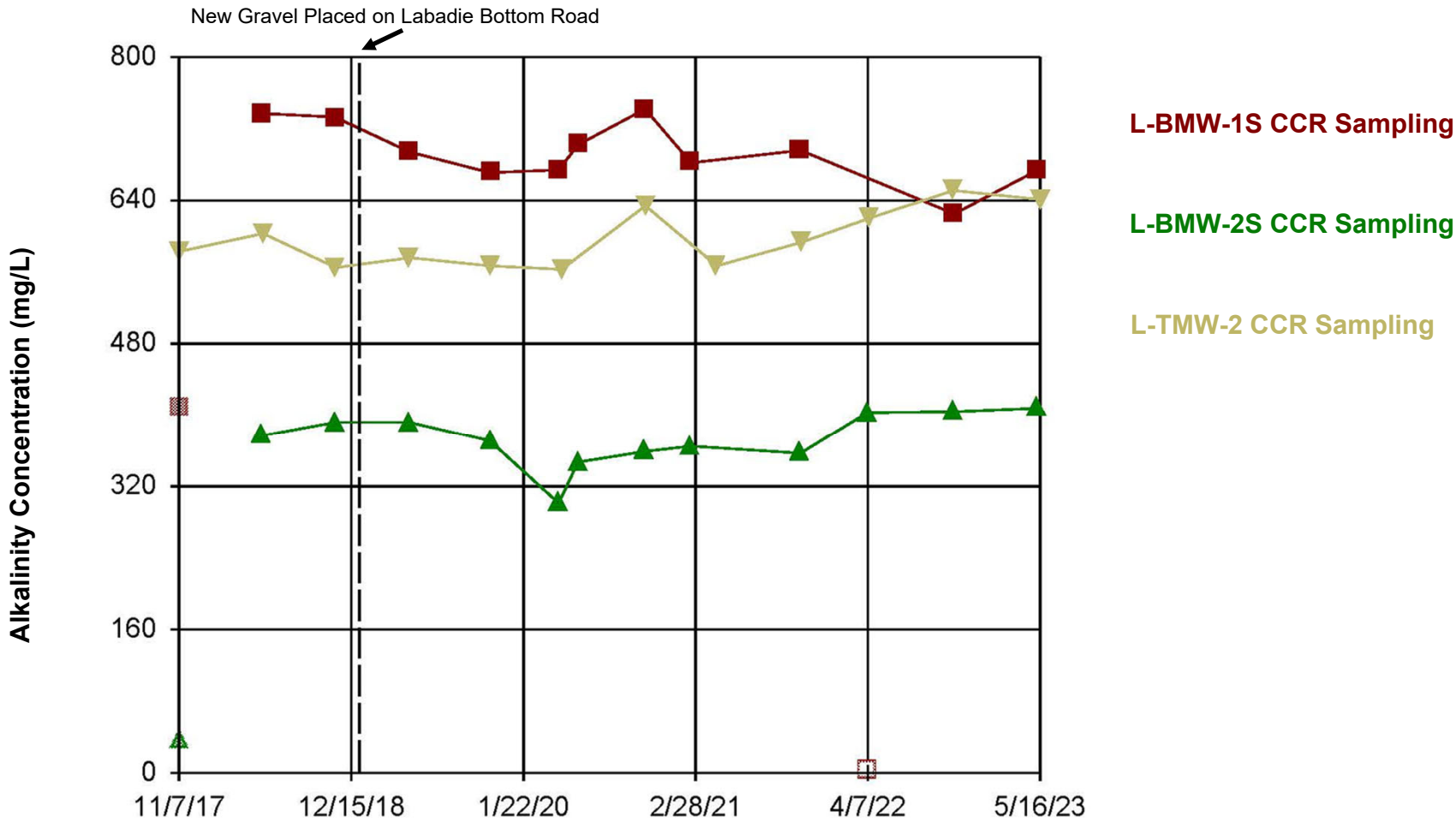
ROCKSMITH GEOENGINEERING



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

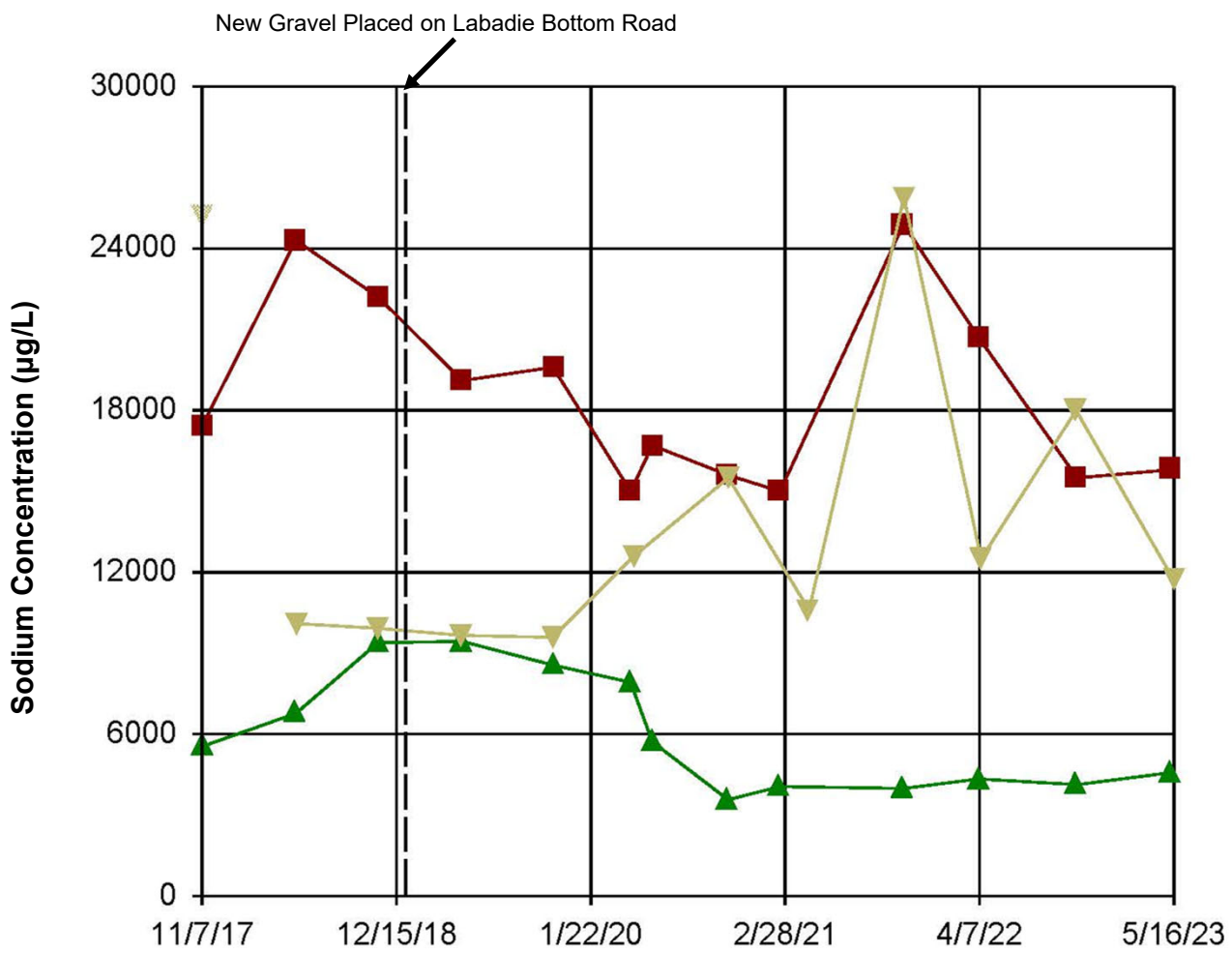
CLIENT/PROJECT					TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER					Timeseries Plot of Magnesium Concentrations at TMW-2 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE		Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-12-11		NA	23007	7

ROCKSMITH GEOENGINEERING



Notes
1) mg/L – Milligrams per liter.
2) UWL – Utility Waste Landfill.
3) CCR – Coal Combustion Residuals.
4) Data points not connected to lines are considered outliers.
5) Non-detected concentrations are depicted as unfilled points.

CLIENT/PROJECT				TITLE
AMEREN MISSOURI **LABADIE ENERGY CENTER**				**Timeseries Plot of Alkalinity Concentrations at TMW-2 and Background Monitoring Wells**
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2023-12-11	Rev No. NA / JOB NO. 23007 / FIGURE **8**



Notes
1) µg/L – Micrograms per liter.
2) UWL – Utility Waste Landfill.
3) CCR – Coal Combustion Residuals.
4) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Sodium Concentrations at TMW-2 and Background Monitoring Wells
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2023-03-23	Rev No. NA
				JOB NO. 23007
				FIGURE 9

LEGEND

Monitoring Well TMW-2

Labadie Bottom Road, Fresh Gravel Placed Late 2018- Early 2019

Gravel Parking Area, April 2016 - Late 2016

LCL1 FCM and Gravel Roads, Built 2015 - October 2016

0 200 400

Feet

NOTE(S)

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. FCM - FABRIC-FORMED ARTICULATED CONCRETE MAT.

REFERENCE(S)

1. LCL1 ALTERNATIVE SOURCE DEMONSTRATION (ROCKSMITH, 2023).

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

CONSULTANT
ROCKSMITH GEOENGINEERING

YYYY-MM-DD	2023-12-01
DESIGNED	GTM
PREPARED	GTM
REVIEWED	JSI
APPROVED	MNH

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
AERIAL MAP OF FRESH GRAVEL PLACEMENT NEAR MONITORING WELL TMW-2

PROJECT NO.
23007

FIGURE
10

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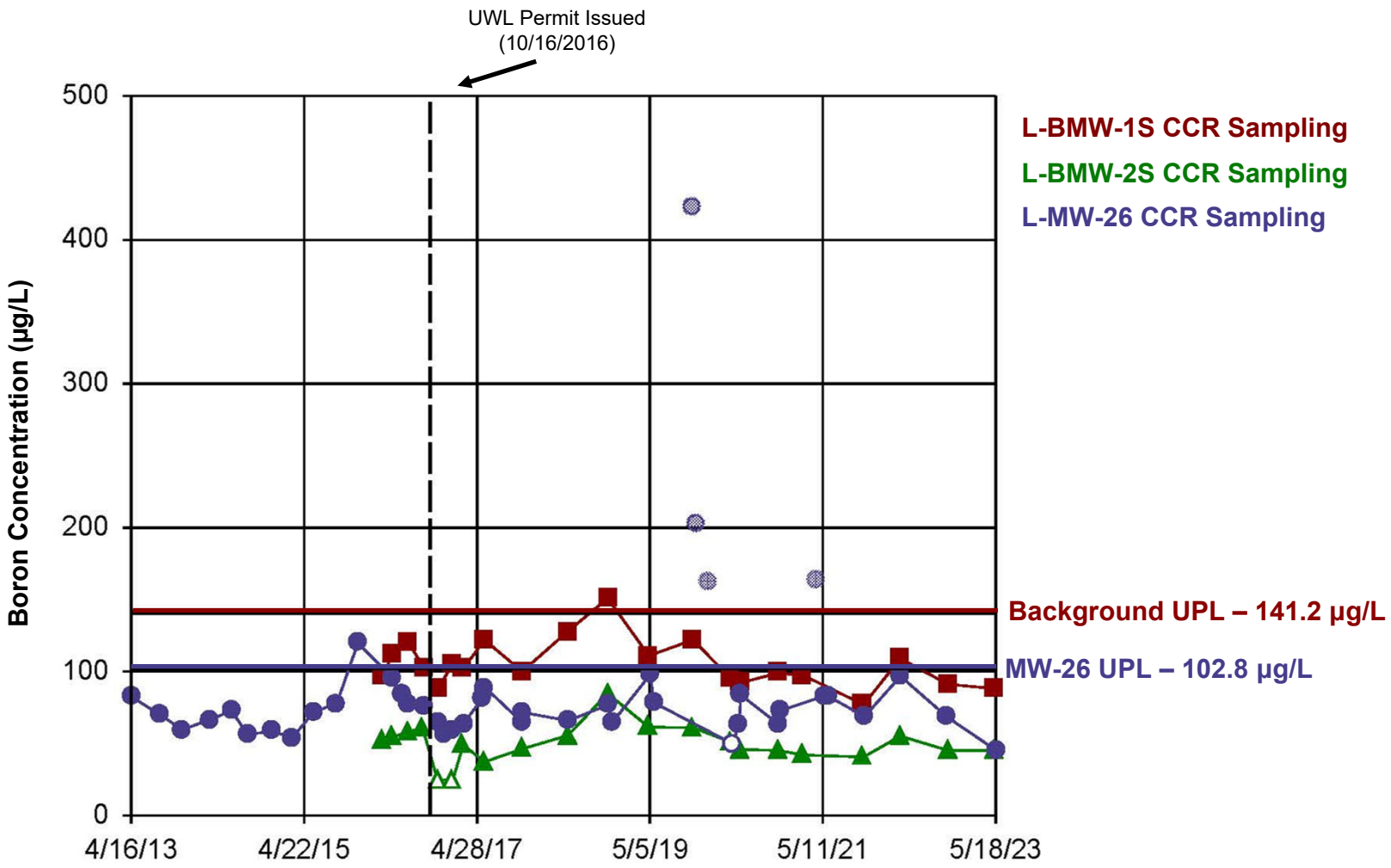

Notes
1) µg/L – Micrograms per liter.
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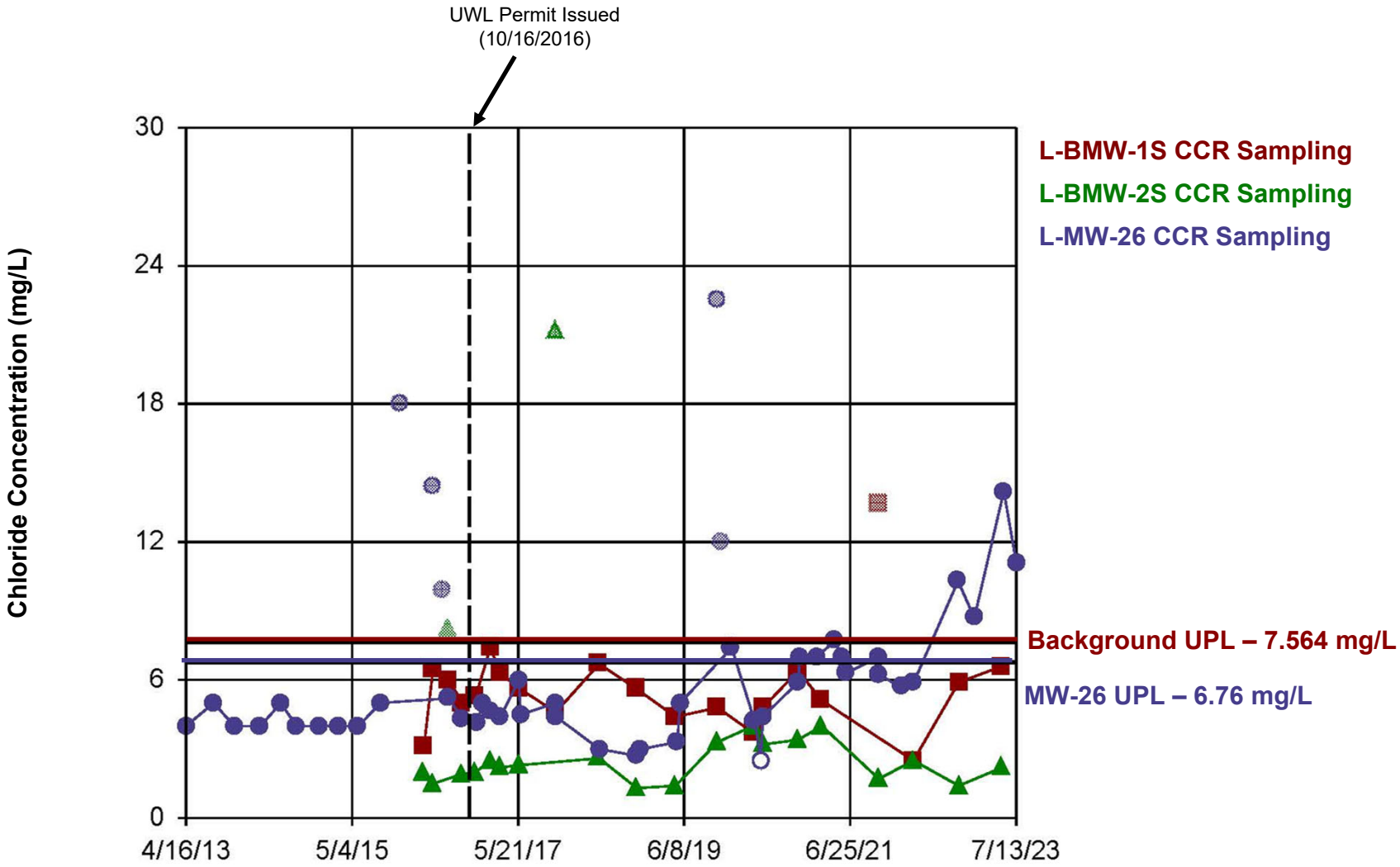
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.
6) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Boron Concentrations at MW-26 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-12-11	NA	23007	13

ROCKSMITH GEOENGINEERING



Notes
1) mg/L – Milligrams per liter.
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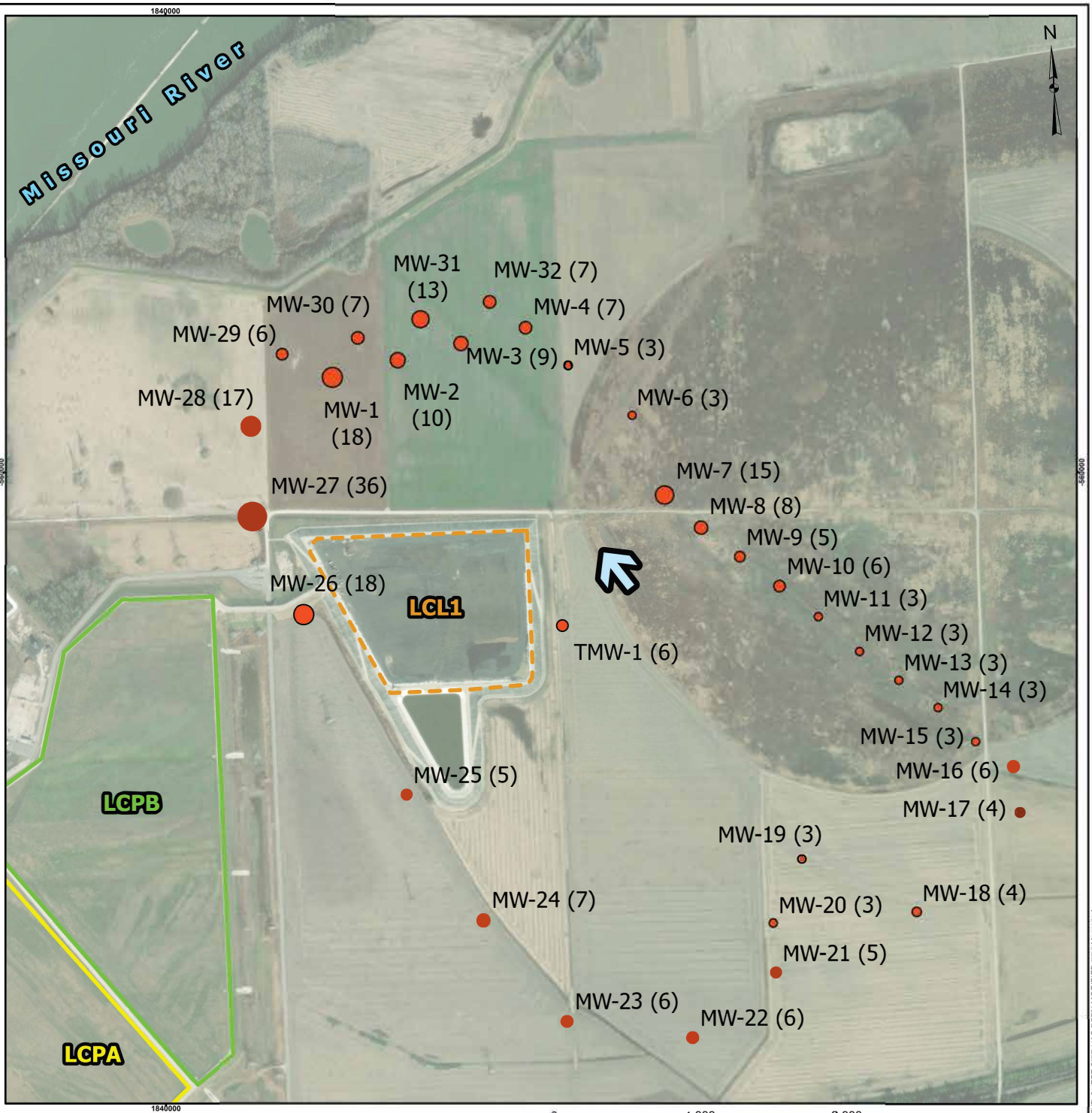
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.
6) Data points not connected to lines are considered outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI LABADIE ENERGY CENTER				Timeseries Plot of Chloride Concentrations at MW-26 and Background Monitoring Wells		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2023-12-11	NA	23007	14

ROCKSMITH GEOENGINEERING



- UWL Monitoring Well (Maximum Chloride Concentration in mg/L)
- LCPA - Closed Bottom Ash Surface Impoundment
- LCPB - Closed Fly Ash Surface Impoundment
- LCL1 - Constructed Following Data Displayed
- Prevailing Groundwater Flow Direction

0 1,000 2,000
Feet

NOTE(S)
1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. MAXIMUM CHLORIDE VALUES GIVEN IN PARENTHESIS IN MILLIGRAMS PER LITER (MG/L).
3. SYMBOL SIZE IS PROPORTIONAL TO MAXIMUM CHLORIDE CONCENTRATION OBSERVED BEFORE SEPTEMBER 2016.

REFERENCE(S)
1. UWL WELL DATA PROVIDED TO ROCKSMITH BY AMEREN.

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CONSULTANT
ROCKSMITH GEOENGINEERING

YYYY-MM-DD	2023-12-14
DESIGNED	GTM
PREPARED	GTM
REVIEWED	JSI
APPROVED	MNH

TITLE
AERIAL MAP OF MAXIMUM CHLORIDE CONCENTRATIONS AT UWL WELLS PRIOR TO PLACEMENT OF CCR IN THE LCL1

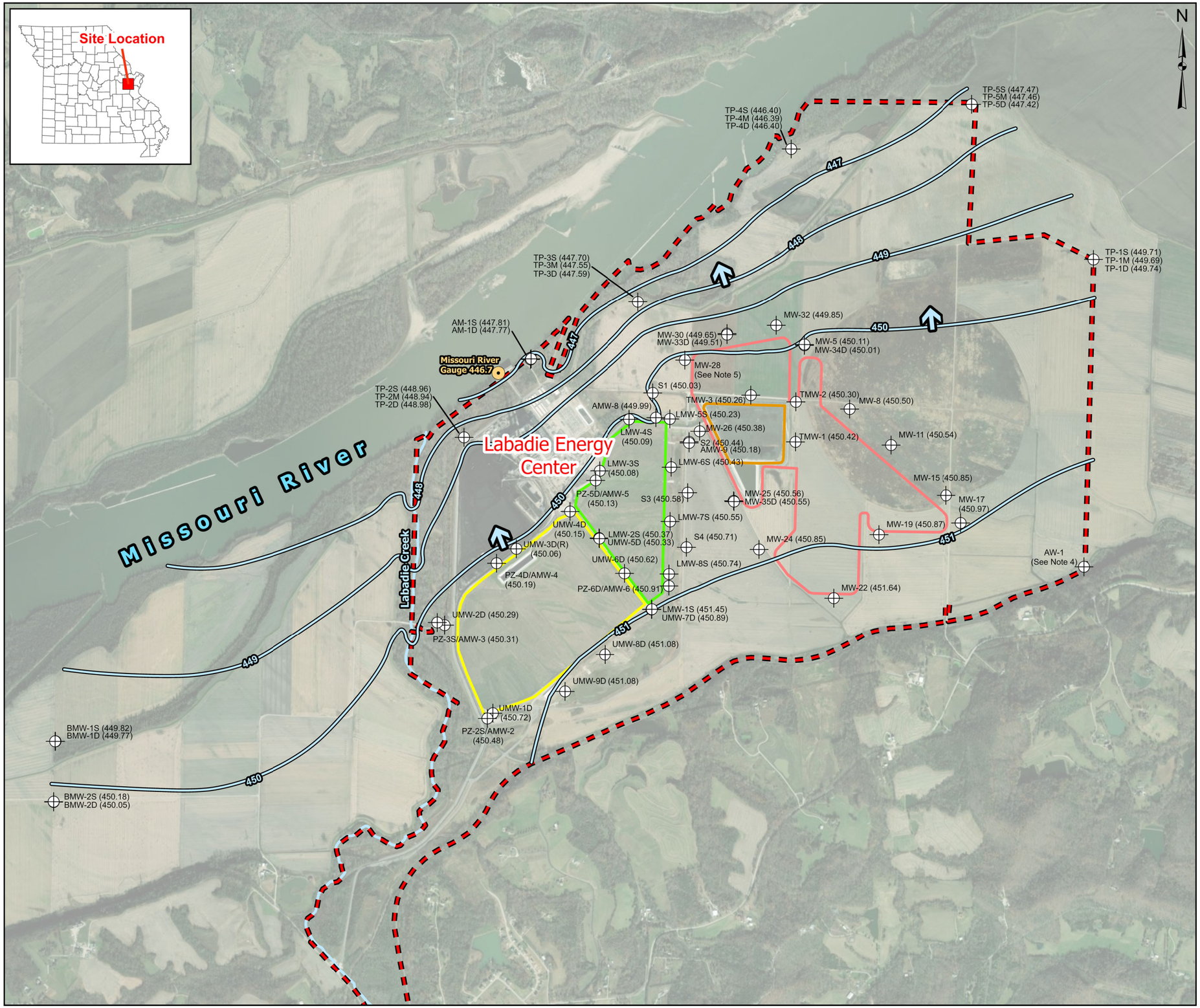
PROJECT NO.
23007

FIGURE
16

PATH: P:\Users\GreenMoore\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.1-LCL1.2 - Production\ASDs\LCL1 Cloride MW-26\LCL1 Cloride MW-26.aprx, PRINTED ON: AT 4:23:50 PM
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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

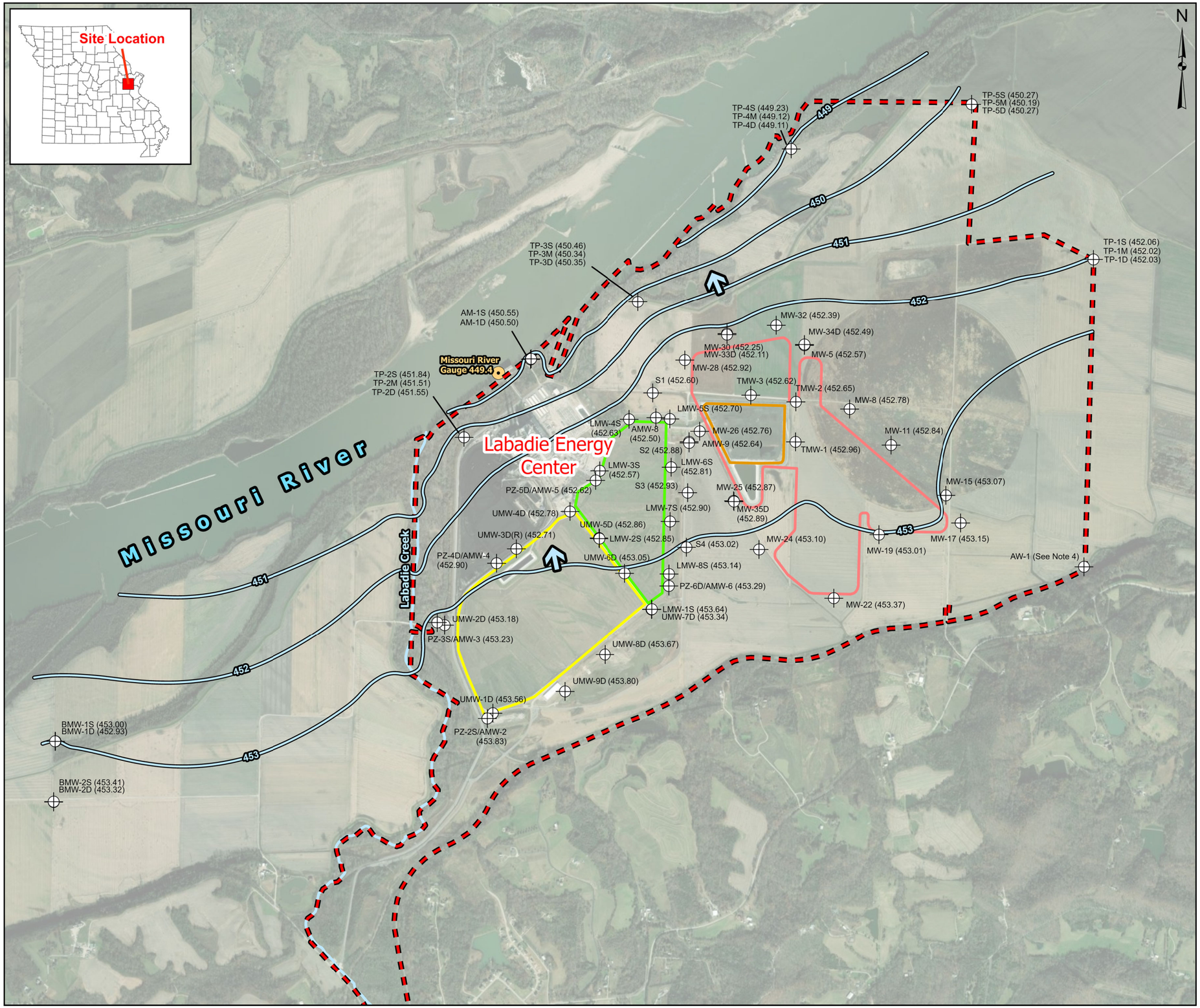
ROCKSMITH GEOENGINEERING

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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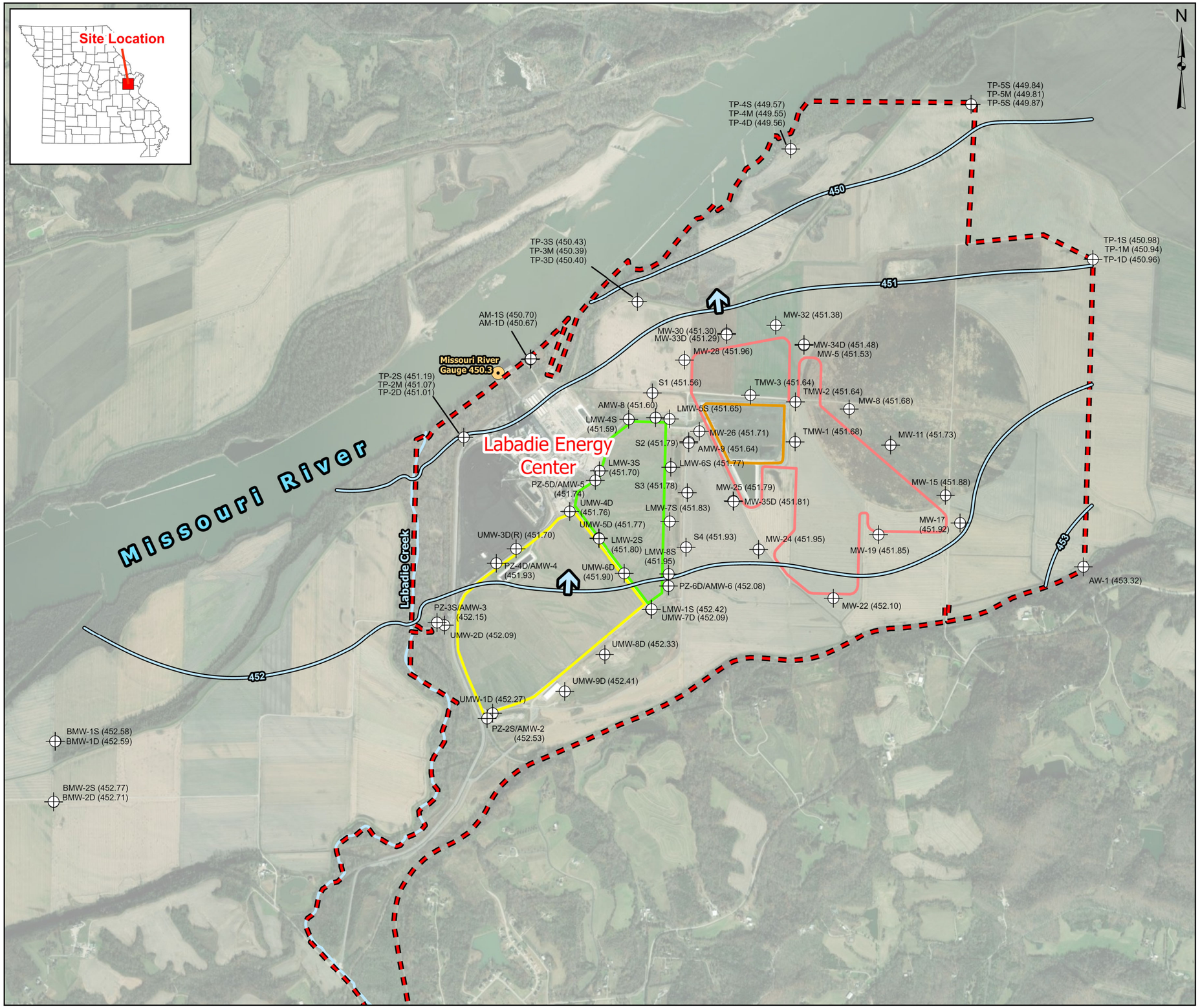
TITLE

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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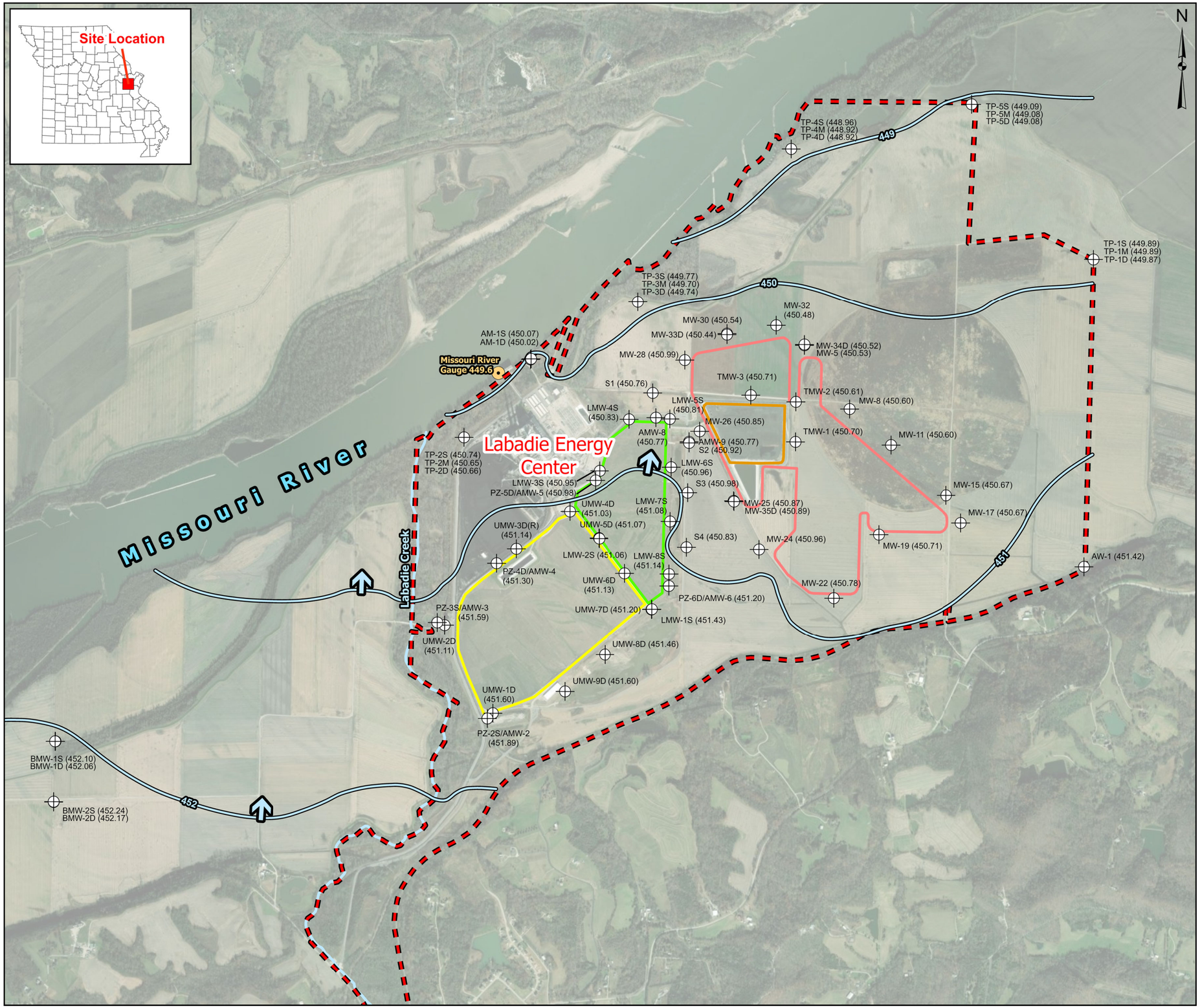

TITLE

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

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	2023-12-29
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

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.1-LEC\4.1.2 - Production\POT MAPS\2023 Annual Report\231115_Nov-LECPotMap.aprx