

#### REPORT

# 2022 Annual Groundwater Monitoring and Corrective Action Report

LCL1 - Utility Waste Landfill Cell 1, Labadie Energy Center, Franklin County, Missouri, USA

Submitted to:

Ameren Missouri

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Submitted by:

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GL153140604

January 31, 2023

# 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, 2022 through December 31, 2022 including verification results related to late 2021 sampling.

Throughout 2022, 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 2022, SSIs have been determined during each sampling event and a summary of the SSIs for the past year is provided in **Table 1**.

Event Name	Type of Event and Sampling Dates	Laboratory Analytical Data Receipt Date	Parameters Collected	Verified SSI	SSI Determination Date	ASD Completion Date		
er 2021 g Event	Detection Monitoring, November 1-4, 2021	December 28, 2021	Appendix III, Major Cations and Anions	<u>Calcium:</u> TMW-2 <u>Chloride:</u> TMW-2	March 28, 2022	lune 24, 2022		
November Sampling E	Verification Sampling, February 10, 2022 February 28, 2022 Detected Appendix III Parameters (See Note 1)	<u>Sulfate:</u> TMW-2 <u>TDS:</u> TMW-2	March 28, 2022	June 24, 2022				
2022 g Event	Detection Monitoring, April 6-11, 2022	June 5, 2022	Appendix III, Major Cations and Anions	<u>Calcium:</u> TMW-2 Chloride: TMW-2	September 2,	November 18, 2022		
April 2022 Sampling Event	Verification Sampling, June 22, 2022	July 8, 2022	Detected Appendix III Parameters <sup>(See</sup> <sub>Note 1)</sub>	Sulfate: TMW-2 TDS: TMW-2	2022			
October 2022 Sampling Event	Detection Monitoring, October 24-27, 2022	November, 22 2022	Appendix III, Major Cations and Anions	To be determined after statistical analyses and Verification Sampling are completed in 2023.				

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 2022 with no new wells being installed or decommissioned.

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2022 Potentiometric Surface Maps

#### **1.0 INSTALLATION OR DECOMMISSIONING 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 (6) groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**. No new monitoring wells were installed or decommissioned in 2022 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 2022. **Table 2** below provides a summary of the groundwater samples collected in 2022 including the number of samples, the date of sample collection, and the monitoring program.

	Groundwater Monitoring Wells								
Sampling Event	BMW-1S	BMW-2S	MW-26	TMW-1	TMW-2	TMW-3	Monitoring Program		
	Date of Sample Collection								
February 2022 Verification Sampling	-	-	2/10/2022	-	2/10/2022	-	Detection		
April 2022 Sampling Event	4/6/2022	4/6/2022	4/7/2022	4/11/2022	4/11/2022	4/11/2022	Detection		
June 2022 Verification Sampling	-	-	-	-	6/22/2022	-	Detection		
October 2022 Sampling Event	10/27/2022	10/27/2022	10/24/2022	10/26/2022	10/25/2022	10/26/2022	Detection		
Total Number of Samples Collected	2	2	3	2	4	2	NA		

Notes:

2.) Verification Sampling events tested for Appendix III parameters above the prediction limit for that analyte/well.

3.) "-" No sample collected.

4.) NA - Not applicable.

#### 2.1 Detection Monitoring Program

A Detection Monitoring sampling event was completed November 1-4, 2021. Verification sampling and the statistical analysis to evaluate for SSIs for the November 2021 event were not completed until 2022 and are therefore included in this report. Detection of Appendix III analytes triggered a verification sampling event, which was completed on February 10, 2022 and verified SSIs. **Table 3** summarizes the results of the statistical analysis of the November 2021 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or

<sup>1.)</sup> Detection Monitoring events tested for Appendix III parameters.

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.

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

Detection monitoring samples were collected April 6-11, 2022 and testing was completed for all Appendix III analytes, as well as major cations and anions. Detection of Appendix III analytes triggered Verification sampling, which was completed June 22, 2022 and the testing results verified SSIs. **Table 4** summarizes the results of the statistical analysis of the April 2022 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**. As with the November 2021 sampling event, the SSIs reported for the monitoring data were not caused by the LCL1 CCR Unit and an ASD for the April 2022 sampling event is provided in **Appendix C**.

A Detection Monitoring sampling event was completed October 24-27, 2022 and testing was performed for all Appendix III analytes, as well as major cations and anions. Statistical analyses to evaluate for SSIs in the October 2022 data were not completed in 2022 and the results will be provided in the 2023 Annual Report. **Table 5** summarizes the results of the October 2022 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.

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 0.0008 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 2022.

#### 3.0 ACTIVITIES PLANNED FOR 2023

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2023. Statistical analysis of the October 2022 Detection Monitoring data will be completed in 2023 and included in the 2023 Annual Report.

## Tables

# Table 3November 2021 Detection Monitoring ResultsLCL1 - Utility Waste Landfill Cell 1Labadie Energy Center, Franklin County, MO

		BACKG	ROUND			GROU	INDWATER M	IONITORING V	VELLS		
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
			N	ovember 202	1 Detection N	/Ionitoring Eve	ent				
DATE	NA	11/1/2021	11/1/2021	NA	11/4/2021	NA	11/2/2021	NA	11/2/2021	NA	11/2/2021
рН	SU	6.68	6.97	6.658-7.339	6.81	6.683-7.105	6.89	6.42-7.17	6.87	6.585-7.07	6.73
BORON, TOTAL	μg/L	77.0 J	40.7 J	102.8	68.7 J	121.6	113	134.3	119	136.9	116
CALCIUM, TOTAL	μg/L	260,000	140,000	155,150	146,000	183,389	161,000	205,487	240,000	202,001	161,000
CHLORIDE, TOTAL	mg/L	13.7	1.7 J	6.76	6.2 J	5.718	2.6 J	7.142	19.7	8.621	3.8 J
FLUORIDE, TOTAL	mg/L	ND	0.14 J	0.2118	0.24	0.2975	0.27	0.2972	0.25	0.2626	0.20
SULFATE, TOTAL	mg/L	146	46.2	38.24	29.3	128	61.4	115.5	259	104	40.3
TOTAL DISSOLVED SOLIDS	mg/L	953 J	475 J	543.7	490	733.7	617	815.4	960	815.4	595
		-	F	February 2022	Verification	Sampling Eve	nt				-
DATE	NA				2/10/2022				2/10/2022		
рН	SU										
BORON, TOTAL	μg/L										
CALCIUM, TOTAL	μg/L								278,000		
CHLORIDE, TOTAL	mg/L								43.1		
FLUORIDE, TOTAL	mg/L				ND						
SULFATE, TOTAL	mg/L								359		
TOTAL DISSOLVED SOLIDS	mg/L								1,360 J		

NOTES:

1. Unit Abbreviations:  $\mu g/L$  - micrograms per liter, mg/L - milligrams per liter, SU - standard units.

2. J - Result is an estimated value.

3. NA - Not applicable.

4. Prediction Limits calculated using Sanitas Software.

5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).

6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).

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

8. 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: EMS Checked By: LMS Reviewed By: MNH

#### Table 4 April 2022 Detection Monitoring Results LCL1 - Utility Waste Landfill Cell 1 Labadie Energy Center, Franklin County, MO

		BACKG	ROUND			GROU	INDWATER M	IONITORING V	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
				April 2022 D	etection Mor	nitoring Event			-		
DATE	NA	4/6/2022	4/6/2022	NA	4/7/2022	NA	4/11/2022	NA	4/11/2022	NA	4/11/2022
рН	SU	7.10	7.06	6.658-7.339	6.94	6.683-7.105	6.95	6.42-7.17	6.93	6.585-7.07	6.82
BORON, TOTAL	μg/L	109	55.2 J	103	96.8 J	121.6	114	134.3	110	136.9	116
CALCIUM, TOTAL	μg/L	221,000	138,000	155,150	140,000	183,389	165,000	205,487	220,000	202,001	141,000
CHLORIDE, TOTAL	mg/L	2.5 J	2.5 J	6.76	5.9 J	5.718	2.9 J	7.142	11.9	8.621	2.5 J
FLUORIDE, TOTAL	mg/L	0.20 J	0.19 J	0.2118	ND	0.2975	0.21	0.2972	ND	0.2626	0.20 J
SULFATE, TOTAL	mg/L	38.6	45.7	38.24	29.0	128	91.9	115.5	197	104	27.8
TOTAL DISSOLVED SOLIDS	mg/L	828 J	513 J	543.7	498	733.7	653	815.4	975	815.4	684
			-	June 2022 V	erification Sa	mpling Event	-		-	-	
DATE	NA								6/22/2022		
рН	SU										
BORON, TOTAL	μg/L										
CALCIUM, TOTAL	μg/L								215,000		
CHLORIDE, TOTAL	mg/L								10.0		
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L								175		
TOTAL DISSOLVED SOLIDS	mg/L								940		

NOTES:

1. Unit Abbreviations:  $\mu g/L$  - 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: BTT Checked By: GTM Reviewed By: MNH

#### Table 5 October 2022 Detection Monitoring Results LCL1 - Utility Waste Landfill Cell 1 Labadie Energy Center, Franklin County, MO

		BACKG	Round	GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	MW-26	TMW-1	TMW-2	TMW-3				
		Ostobor 2022	Detection M	mitoring Fuor	*						
October 2022 Detection Monitoring Event											
DATE	NA	10/27/2022	10/27/2022	10/24/2022	10/26/2022	10/25/2022	10/26/2022				
рН	SU	6.68	6.95	6.80	6.80	6.67	6.79				
BORON, TOTAL	μg/L	91.2 J	45.3 J	68.3 J	115	115	98.3 J				
CALCIUM, TOTAL	μg/L	185,000	146,000	128,000	159,000	246,000 J	134,000				
CHLORIDE, TOTAL	mg/L	5.9	1.4	10.3 J	3.2 J	18.2	3.1				
FLUORIDE, TOTAL	mg/L	ND	ND	ND	ND	ND	ND				
SULFATE, TOTAL	mg/L	66.5	34.4	31.3	70.8	247 J	39.5				
TOTAL DISSOLVED SOLIDS	mg/L	710	496	493	664	1,070	496				

NOTES:

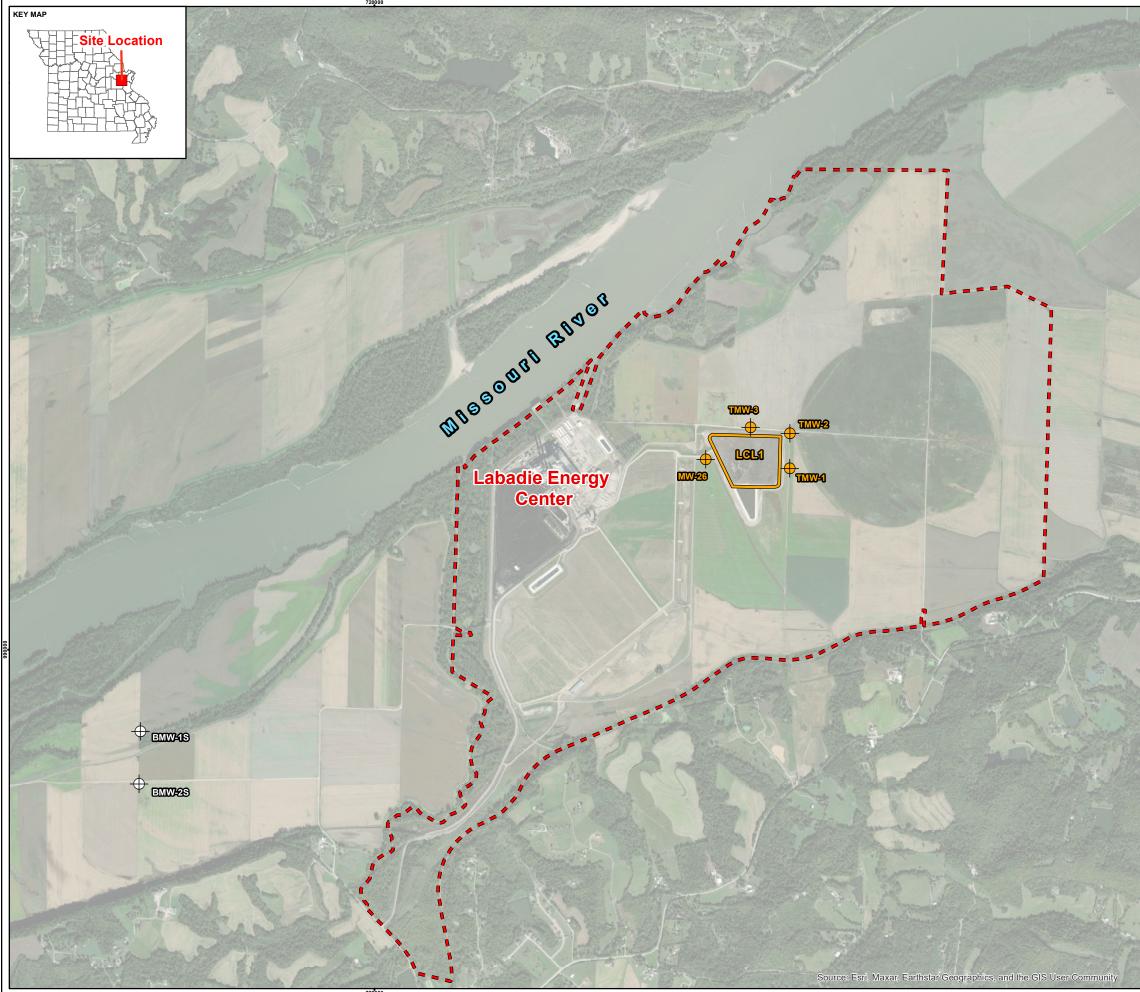
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.

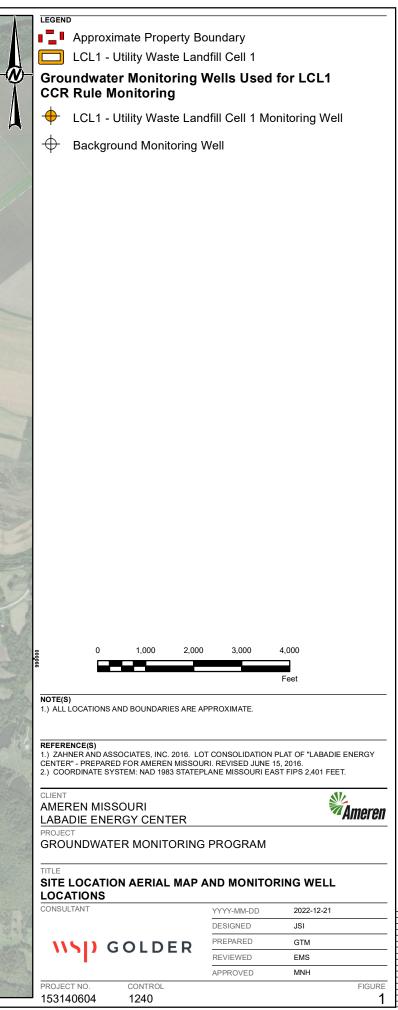
2. J - Result is an estimated value.

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.

# Figures





1 In IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFI

APPENDIX A

# Laboratory Analytical Data



February 28, 2022

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

RE: Project: AMEREN VS LCL1 Pace Project No.: 60392702

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on February 12, 2022. 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,

Jami Church

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

Enclosures

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





#### CERTIFICATIONS

Project: AMEREN VS LCL1

Pace Project No.: 60392702

#### **Pace Analytical Services Kansas**

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



#### SAMPLE SUMMARY

Project: AMEREN VS LCL1

Pace Project No.: 60392702

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60392702001	L-TMW-2	Water	02/10/22 09:55	02/12/22 04:50
60392702002	L-MW-26	Water	02/10/22 12:20	02/12/22 04:50
60392702003	L-LCL1-FB-1	Water	02/10/22 12:30	02/12/22 04:50
60392702004	L-LCL1-DUP-1	Water	02/10/22 00:00	02/12/22 04:50



#### SAMPLE ANALYTE COUNT

Project: AMEREN VS LCL1 Pace Project No.: 60392702

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60392702001	L-TMW-2	EPA 200.7	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2, SK	3	PASI-K
60392702002	L-MW-26	EPA 200.7	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60392702003	L-LCL1-FB-1	EPA 200.7	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60392702004	L-LCL1-DUP-1	EPA 200.7	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	SK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



Project: AMEREN VS LCL1

Pace Project No.: 60392702

Sample: L-TMW-2	Lab ID: 60392702001		Collected	Collected: 02/10/22 09:55		Received: 02/	Received: 02/12/22 04:50 M		atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7				
	Pace Anal	vtical Services	- Kansas Ci	ty						
Calcium	278000	ug/L	600	226	3	02/15/22 14:27	02/28/22 13:44	7440-70-2		
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C							
	Pace Anal	vtical Services	- Kansas Ci	ty						
Total Dissolved Solids	1360	mg/L	13.3	13.3	1		02/16/22 15:27			
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0							
-	Pace Anal	vtical Services	- Kansas Ci	ty						
Chloride	43.1	mg/L	10.0	5.3	10		02/18/22 14:58	16887-00-6		
Fluoride	0.16J	mg/L	0.20	0.12	1		02/18/22 14:17	16984-48-8		
Sulfate	359	mg/L	50.0	27.5	50		02/23/22 13:54	14808-79-8		



Project: AMEREN VS LCL1

Pace Project No.: 60392702

Sample: L-MW-26	Lab ID: 60392702002		Collected: 02/10/22 12:20		Received: 02/12/22 04:50 M		atrix: Water		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2	•		od: EP	A 200.7			
	Pace Analy	tical Services/	- Kansas C	ity					
Calcium	140000	ug/L	400	151	2	02/15/22 14:27	02/28/22 13:51	7440-70-2	
2540C Total Dissolved Solids	Analytical I	Method: SM 25	40C						
	Pace Analy	tical Services	- Kansas C	ity					
Total Dissolved Solids	498	mg/L	10.0	10.0	1		02/16/22 15:27		
300.0 IC Anions 28 Days	Analytical I	Method: EPA 3	00.0						
-	Pace Analy	tical Services	- Kansas Ci	ity					
Chloride	5.7	mg/L	1.0	0.53	1		02/18/22 15:40	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		02/18/22 15:40	16984-48-8	
Sulfate	31.5	mg/L	5.0	2.8	5		02/18/22 15:54	14808-79-8	



#### Project: AMEREN VS LCL1

Pace Project No.: 60392702

Sample: L-LCL1-FB-1	Lab ID:	60392702003	Collected	l: 02/10/22	2 12:30	Received: 02/	(12/22 04:50 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	200.7 Prepa	ration Meth	od: EP	A 200.7			
	Pace Anal	ytical Services	- Kansas Ci	ty					
Calcium	91.1J	ug/L	200	75.4	1	02/15/22 14:27	02/28/22 13:53	7440-70-2	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
	Pace Anal	ytical Services	- Kansas Ci	ty					
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		02/16/22 15:27		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
	Pace Anal	ytical Services	- Kansas Ci	ty					
Chloride	<0.53	mg/L	1.0	0.53	1		02/18/22 16:08	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		02/18/22 16:08	16984-48-8	
Sulfate	<0.55	mg/L	1.0	0.55	1		02/18/22 16:08	14808-79-8	



Project: AMEREN VS LCL1

Pace Project No.: 60392702

Sample: L-LCL1-DUP-1	Lab ID:	60392702004	Collected	: 02/10/22	2 00:00	Received: 02/	12/22 04:50 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
	Pace Anal	ytical Services	<ul> <li>Kansas Cit</li> </ul>	ty					
Calcium	292000	ug/L	1000	377	5	02/15/22 14:27	02/28/22 13:55	7440-70-2	
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C						
	Pace Anal	ytical Services	- Kansas Cit	iy .					
Total Dissolved Solids	1060	mg/L	13.3	13.3	1		02/17/22 09:33		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
-	Pace Anal	ytical Services	- Kansas Cit	y					
Chloride	41.3	mg/L	10.0	5.3	10		02/25/22 16:55	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		02/25/22 15:49	16984-48-8	
Sulfate	352	mg/L	50.0	27.5	50		02/28/22 10:57	14808-79-8	



Project:	AMEREN VS LCL	1										
Pace Project No.:	60392702											
QC Batch:	771128		Analy	sis Metho	d: l	EPA 200.7						
QC Batch Method:	EPA 200.7		Analysis Description:			200.7 Metal	s, Total					
			Labo	Laboratory:		Pace Analytical Services - Kansas City						
Associated Lab Sam	ples: 60392702	001, 6039270200	02, 6039270	2003, 603	92702004							
METHOD BLANK:	3079100			Matrix: W	ater							
Associated Lab Sam	ples: 60392702	001, 6039270200	2, 6039270	2003, 603	92702004							
			Blar	nk l	Reporting							
		Units	Res	ult	Limit	MDI	_	Analyzed	d Qı	ualifiers		
Param	leter	Onito										
Param		ug/L		<75.4	20	0	75.4	02/28/22 13	3:38			
	ITROL SAMPLE:		Spike Conc.		S	LCS % Rec	%	02/28/22 13 Rec imits	Qualifiers			
Calcium LABORATORY CON	ITROL SAMPLE:	ug/L 3079101	Spike	<75.4 LC Res	S	LCS	% Li	Rec				
Calcium LABORATORY CON Param	ITROL SAMPLE:	ug/L 3079101 Units ug/L	Spike Conc. 1000	<75.4 LC Res	S Sult	LCS % Rec 10 <sup>7</sup>	% Li	Rec				
Calcium LABORATORY CON Param Calcium	ITROL SAMPLE:	ug/L 3079101 Units ug/L PLICATE: 3079	Spike 	<75.4 LC Res 10 MSD	S sult 10100 3079103	LCS % Rec 10 <sup>7</sup>	%  I	Rec imits 85-115	Qualifiers			
Calcium LABORATORY CON Param Calcium MATRIX SPIKE & M	ITROL SAMPLE: eter	ug/L 3079101 Units ug/L PLICATE: 3079 60392702001	Spike Conc. 1000 102 MS Spike	<75.4 LC Res 00 MSD Spike	S Sult 10100 3079103 MS	LCS % Rec 10 <sup>7</sup> MSD	Li MS	Rec imits 85-115 MSD	Qualifiers % Rec	-	Max	0.0
Calcium LABORATORY CON Param Calcium	ITROL SAMPLE:	ug/L 3079101 Units ug/L PLICATE: 3079 60392702001	Spike 	<75.4 LC Res 10 MSD	S sult 10100 3079103	LCS % Rec 10 <sup>7</sup>	%  I	Rec imits 85-115 MSD % Rec	Qualifiers % Rec Limits		RPD	Qual

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.



Project:	AMERE	N VS LCL	1							
Pace Project No.:	6039270	02								
QC Batch:	77142	7		Analysis Me	ethod:	SM 25400	;			
QC Batch Method:	SM 25	40C		Analysis De	escription:	2540C To	tal Disso	Ived Solids		
				Laboratory:				ervices - Ka	nsas C	ity
Associated Lab Sar	nples:	603927020	001, 603927020	02, 60392702003						
METHOD BLANK:	3080232	2		Matrix	: Water					
Associated Lab Sar	nples:	603927020	001, 603927020	02, 60392702003						
				Blank	Reporting	J				
Paran	neter		Units	Result	Limit	Μ	DL	Analyz	zed	Qualifiers
Total Dissolved Soli	ds		mg/L			5.0	5.0	02/16/22	15:24	
LABORATORY CO	NTROL S	AMPLE:	3080233							
				Spike	LCS	LCS		% Rec		
Paran	neter		Units	Conc.	Result	% Rec		Limits	Qua	alifiers
Total Dissolved Soli	ds		mg/L	1000	1010	1	01	80-120		
SAMPLE DUPLICA	TE: 308	80234								
_				60392429003	Dup	-		Max		0 11
Parar	neter		Units	Result	Result	R	PD	RPD		Qualifiers
Total Dissolved Soli	ds		mg/L	883		903	2		10	
SAMPLE DUPLICA	TE: 308	80235								
				60392702001	Dup			Max		
Parar	neter		Units	Result	Result	RI	PD	RPD		Qualifiers
Total Dissolved Soli	ds		mg/L	1360	1:	300	5		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.



#### **QUALITY CONTROL DATA**

Project: AMEREN VS LCL	1							
Pace Project No.: 60392702 QC Batch: 771592		Apolycia	Actord:	SM 2540C				
		Analysis N			D'			
QC Batch Method: SM 2540C			escription:	2540C Total				
Associated Lab Samples: 60392702	004	Laboratory	/:	Pace Analyti	cal Sel	rvices - Kar	isas C	ity
METHOD BLANK: 3080734		Matri	ix: Water					
Associated Lab Samples: 60392702	004							
		Blank	Reportin	g				
Parameter	Units	Result	Limit	MDL	-	Analyz	zed	Qualifiers
Total Dissolved Solids	mg/L	<5.	0	5.0	5.0	02/17/22	09:32	
LABORATORY CONTROL SAMPLE:	3080735	Spike	LCS	LCS	9	6 Rec		
Parameter	Units	Conc.	Result	% Rec	L	_imits	Qua	alifiers
Total Dissolved Solids	mg/L	1000	991	99	)	80-120		
SAMPLE DUPLICATE: 3080736								
		60392705006				Max		
Parameter	Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Solids	mg/L	56	4	551	2		10	
SAMPLE DUPLICATE: 3080737								
		60392712001				Max		
Parameter	Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Solids	mg/L	67	4	671	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.



QC Batch: 771	702		Analy	sis Meth	od:	EPA 300.0						
	300.0		-	sis Desc		300.0 IC Ani	ons					
				ratory:	•	Pace Analyti		vices - Kans	as Citv			
Associated Lab Samples:	603927020	01, 6039270200		•		i acc / illaly i						
METHOD BLANK: 30812	280			Matrix:	Water							
Associated Lab Samples:	603927020	01, 6039270200										
-			Blan		Reporting							
Parameter		Units	Resu	ult	Limit	MDL		Analyze	d G	ualifiers		
Chloride		mg/L		<0.53	1.		0.53	02/18/22 07				
Fluoride		mg/L		<0.12	0.2		0.12	02/18/22 07				
Sulfate		mg/L		<0.55	1.	0	0.55	02/18/22 07	7:28			
METHOD BLANK: 3084	126			Matrix:	Water							
Associated Lab Samples:	603927020	01, 6039270200										
	000021020	.,	Blan		Reporting							
Parameter		Units	Resu		Limit	MDL		Analyze	d C	ualifiers		
Chloride		mg/L		<0.53	1.	0	0.53	02/23/22 09	 ⊇·22			
Fluoride		mg/L		<0.12	0.2		0.12	02/23/22 09				
Sulfate		-										
		mg/L		<0.55	1.	0	0.55	02/23/22 09	9:22			
LABORATORY CONTROL	SAMPLE:	3081281	Spike	L	.CS	LCS	%	Rec				
LABORATORY CONTROL Parameter	SAMPLE:	3081281 Units	Conc.	L R	.CS esult	LCS % Rec	% L	Rec imits	Qualifiers			
LABORATORY CONTROL Parameter Chloride	SAMPLE:	3081281 Units mg/L	Conc.	L R 5	.CS esult 4.5	LCS % Rec 91	% L	o Rec imits 90-110				
LABORATORY CONTROL Parameter Chloride Fluoride	SAMPLE:	3081281 Units mg/L mg/L	Conc. 2.	L R 5 5 5	CS esult 4.5 2.6	LCS % Rec 91 103	% L	90-110 90-110				
ABORATORY CONTROL Parameter Chloride Fluoride	SAMPLE:	3081281 Units mg/L	Conc. 2.	L R 5	.CS esult 4.5	LCS % Rec 91	% L	o Rec imits 90-110				
LABORATORY CONTROL Parameter Chloride Fluoride Sulfate		3081281 Units mg/L mg/L	Conc. 2.	L R 5 5 5 5	CS esult 4.5 2.6 4.8	LCS % Rec 91 103 96	% 	90-110 90-110 90-110 90-110		_		
LABORATORY CONTROL Parameter Chloride Fluoride Sulfate LABORATORY CONTROL		3081281 Units mg/L mg/L mg/L 3084127	Conc. 2. Spike	L R 5 5 5 5	CS esult 4.5 2.6 4.8 CS	LCS % Rec 91 103 96 LCS	% 	6 Rec imits 90-110 90-110 90-110 90-110	Qualifiers			
ABORATORY CONTROL Parameter Chloride Fluoride Sulfate		3081281 Units mg/L mg/L mg/L	Conc. 2.	L R 5 5 5 5	CS esult 4.5 2.6 4.8	LCS % Rec 91 103 96	% 	90-110 90-110 90-110 90-110				
LABORATORY CONTROL Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride		3081281 Units mg/L mg/L mg/L 3084127 Units mg/L	Conc.	L 5 5 5 5 5 5	.CS esult 4.5 2.6 4.8 .CS esult 4.9	LCS % Rec 91 103 96 LCS % Rec 99	%  % 	6 Rec imits 90-110 90-110 90-110 6 Rec imits 90-110	Qualifiers			
LABORATORY CONTROL Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride		3081281 Units mg/L mg/L mg/L 3084127 Units mg/L mg/L	Spike Conc.	L 5 5 5 5 5 5 5 5	CS esult 4.5 2.6 4.8 CS esult 4.9 2.5	LCS % Rec 91 103 96 LCS % Rec 99 102	%  % 	6 Rec imits 90-110 90-110 90-110 6 Rec imits 90-110 90-110	Qualifiers			
LABORATORY CONTROL Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride		3081281 Units mg/L mg/L mg/L 3084127 Units mg/L	Spike Conc.	L 5 5 5 5 5 5	.CS esult 4.5 2.6 4.8 .CS esult 4.9	LCS % Rec 91 103 96 LCS % Rec 99	%  % 	6 Rec imits 90-110 90-110 90-110 6 Rec imits 90-110	Qualifiers			
LABORATORY CONTROL Parameter Chloride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate	SAMPLE:	3081281 Units mg/L mg/L mg/L 3084127 Units mg/L mg/L mg/L		L 5 5 5 5 5 5 5 5 5 5 5	CS esult 4.5 2.6 4.8 CS esult 4.9 2.5	LCS % Rec 91 103 96 LCS % Rec 99 102 102	%  % 	6 Rec imits 90-110 90-110 90-110 6 Rec imits 90-110 90-110	Qualifiers			
LABORATORY CONTROL Parameter Chloride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate	SAMPLE:	3081281 Units mg/L mg/L 3084127 Units mg/L mg/L mg/L mg/L	Conc. 2. Spike Conc. 2. 282 MS	L R 5 5 5 5 5 5 5 5 5 5 5 5 5	CS esult 4.5 2.6 4.8 CS esult 4.9 2.5 5.1 3081283	LCS % Rec 91 103 96 LCS % Rec 99 102 102	%   	6 Rec 90-110 90-110 90-110 90-110 6 Rec imits 90-110 90-110 90-110	Qualifiers			
ABORATORY CONTROL Parameter Chloride Sulfate ABORATORY CONTROL Parameter Chloride Fluoride Sulfate	SAMPLE:	3081281 Units mg/L mg/L mg/L 3084127 Units mg/L mg/L mg/L LICATE: 30812 60392271002	Conc. 2. Spike Conc. 2. 282 MS Spike	L R 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	.CS esult 4.5 2.6 4.8 .CS esult 4.9 2.5 5.1 3081283 MS	LCS % Rec 91 103 96 LCS % Rec 99 102 102 102	% % 	6 Rec 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers Qualifiers % Rec	_	Max	
ABORATORY CONTROL Parameter Chloride Fluoride Sulfate ABORATORY CONTROL Parameter Chloride Fluoride Sulfate	SAMPLE:	3081281 Units mg/L mg/L 3084127 Units mg/L mg/L mg/L mg/L	Conc. 2. Spike Conc. 2. 282 MS	L R 5 5 5 5 5 5 5 5 5 5 5 5 5	CS esult 4.5 2.6 4.8 CS esult 4.9 2.5 5.1 3081283	LCS % Rec 91 103 96 LCS % Rec 99 102 102	%   	6 Rec 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers		RPD	Qu
LABORATORY CONTROL Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX Parameter Chloride	SAMPLE:	3081281 Units mg/L mg/L mg/L 3084127 Units mg/L mg/L mg/L LICATE: 30812 60392271002 Result 10.6	Conc. 2. Spike Conc. 2. 282 MS Spike Conc. 5	L Ri 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	CS esult 4.5 2.6 4.8 CS esult 4.9 2.5 5.1 3081283 MS Result 5 16.0	LCS % Rec 91 103 96 LCS % Rec 99 102 102 3 MSD Result 16.0	% 	6 Rec imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90	Qualifiers Qualifiers % Rec Limits 8 80-120	0 0	RPD 15	Qu
LABORATORY CONTROL Parameter Chloride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX	SAMPLE:	3081281 Units mg/L mg/L mg/L 3084127 Units mg/L mg/L mg/L LICATE: 30813 60392271002 Result	Conc. 2. Spike Conc. 2. 282 MS Spike Conc.	L Ri 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	CS esult 4.5 2.6 4.8 CS esult 4.9 2.5 5.1 3081283 MS Result 5 16.0	LCS % Rec 91 103 96 LCS % Rec 99 102 102 3 MSD Result	% 	6 Rec 90-110 90-110 90-110 90-110 6 Rec imits 90-110 90-110 90-110 90-110 90-110 90-110 90-8 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10 90-10	Qualifiers Qualifiers % Rec Limits 8 80-120 7 80-120	0 0 0 1	RPD	Qua

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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Project: AMEREN VS LCL1 Pace Project No.: 60392702

MATRIX SPIKE & MATRIX S	PIKE DUPLIC	CATE: 3081	284		3081285							
	6	0392702001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	43.1	50	50	92.3	93.0	99	100	80-120	1	15	
Fluoride	mg/L	0.16J	2.5	2.5	3.0	3.0	113	115	80-120	1	15	
Sulfate	mg/L	359	250	250	604	618	98	103	80-120	2	15	

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QC Batch: 772728		Analysis Me	ethod:	EPA 300.0				
QC Batch Method: EPA 300.0		Analysis De		300.0 IC A	nions			
		Laboratory:		Pace Analy	tical Se	rvices - Kar	isas City	/
Associated Lab Samples: 6039270	2004							
METHOD BLANK: 3085023		Matrix	c: Water					
Associated Lab Samples: 6039270	2004							
_		Blank	Reporting					
Parameter	Units	Result	Limit	M	DL	Analyz	ed	Qualifiers
Chloride	mg/L	<0.53		1.0	0.53	02/25/22		
Fluoride	mg/L	<0.12		.20	0.12	02/25/22		
Sulfate	mg/L	<0.55	5	1.0	0.55	02/25/22	15:22	
METHOD BLANK: 3086228		Matrix	c Water					
Associated Lab Samples: 6039270	2004							
		Blank	Reporting	3				
Parameter	Units	Result	Limit	M	DL	Analyz	ed	Qualifiers
Chloride	mg/L	<0.53	3	1.0	0.53	02/28/22	10:29	
Fluoride	mg/L	<0.12		.20	0.12	02/28/22		
Sulfate	mg/L	<0.55	5	1.0	0.55	02/28/22	10:29	
METHOD BLANK: 3086244		Matrix	c Water					
	2004							
Associated Lab Samples: 6039270								
Associated Lab Samples: 6039270	2004	Blank	Reporting	a la				
Associated Lab Samples: 6039270 Parameter	Units	Blank Result	Reporting Limit	) M	DL	Analyz	ed	Qualifiers
Parameter	Units	Result	Limit	M				Qualifiers
	Units mg/L		Limit	-	DL 0.53 0.12	Analyz 02/28/22 02/28/22	12:27	Qualifiers
Parameter	Units	Result <0.53	Limit 2 0	1.0 ME	0.53	02/28/22	12:27 12:27	Qualifiers
Parameter Chloride Fluoride Sulfate	Units mg/L mg/L mg/L	Result <0.53 <0.12	Limit 2 0	1.0 0.20	0.53 0.12	02/28/22 02/28/22	12:27 12:27	Qualifiers
Parameter Chloride Fluoride	Units mg/L mg/L	Result <0.53 <0.12 <0.55	Limit 2 0	MI 1.0 1.20 1.0	0.53 0.12 0.55	02/28/22 02/28/22 02/28/22	12:27 12:27	Qualifiers
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE:	Units mg/L mg/L mg/L 3085024	Result <0.53 <0.12 <0.55 <0.55	Limit Limit	<u>MI</u> 1.0 1.20 1.0 LCS	0.53 0.12 0.55	02/28/22 02/28/22 02/28/22	12:27 12:27 12:27	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter	Units mg/L mg/L mg/L 3085024 Units	Result <0.53 <0.12 <0.55 <0.55	LCS Result	LCS % Rec	0.53 0.12 0.55	02/28/22 02/28/22 02/28/22 6 Rec _imits	12:27 12:27	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride	Units mg/L mg/L mg/L 3085024 Units mg/L	Result <0.53 <0.12 <0.55 <0.55 <0.55 <0.55	LCS Result 4.6	LCS % Rec	0.53 0.12 0.55	02/28/22 02/28/22 02/28/22 02/28/22 6 Rec .imits 90-110	12:27 12:27 12:27	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride	Units mg/L mg/L mg/L 3085024 Units mg/L mg/L	Result <0.53 <0.12 <0.55 <0.55 <0.55 <0.55	LCS Result 4.6 2.5	LCS % Rec	0.53 0.12 0.55 9 	02/28/22 02/28/22 02/28/22 02/28/22 6 Rec imits 90-110 90-110	12:27 12:27 12:27	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride	Units mg/L mg/L mg/L 3085024 Units mg/L	Result <0.53 <0.12 <0.55 <0.55 <0.55 <0.55	LCS Result 4.6	LCS % Rec	0.53 0.12 0.55	02/28/22 02/28/22 02/28/22 02/28/22 6 Rec .imits 90-110	12:27 12:27 12:27	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride	Units mg/L mg/L mg/L 3085024 Units mg/L mg/L	Result <0.53 <0.12 <0.55 Spike Conc. 5 2.5 5	LCS Result 4.6 2.5 4.8	MI 1.0 1.0 LCS % Rec 10	0.53 0.12 0.55 9 	02/28/22 02/28/22 02/28/22 6 Rec Limits 90-110 90-110 90-110	12:27 12:27 12:27	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE:	Units mg/L mg/L mg/L 3085024 Units mg/L mg/L mg/L mg/L	Result 	LCS Result LCS 4.6 2.5 4.8	MI 1.0 LCS % Rec 10 10 10 10 10 10 10 10 10 10 10 10 10	0.53 0.12 0.55 0.55 00 00 07	02/28/22 02/28/22 02/28/22 6 Rec Limits 90-110 90-110 90-110	12:27 12:27 12:27 Qualit	fiers
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride Sulfate	Units mg/L mg/L mg/L 3085024 Units mg/L mg/L mg/L	Result <0.53 <0.12 <0.55 Spike Conc. 5 2.5 5	LCS Result 4.6 2.5 4.8	MI 1.0 1.0 LCS % Rec 10	0.53 0.12 0.55 0.55 00 00 07	02/28/22 02/28/22 02/28/22 6 Rec Limits 90-110 90-110 90-110	12:27 12:27 12:27	fiers
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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**

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



#### Project: AMEREN VS LCL1

Pace Project No.: 60392702

LABORATORY CONTROL SAMPLE:	3086245					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	4.5	90	90-110	
Fluoride	mg/L	2.5	2.5	98	90-110	
Sulfate	mg/L	5	4.7	93	90-110	

MATRIX SPIKE & MATRIX SP	IKE DUPLI	CATE: 3085	025		3085026							
			MS	MSD								
	e	60392702004	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	41.3	50	50	94.9	95.1	107	108	80-120	0	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.6	2.6	103	102	80-120	1	15	
Sulfate	mg/L	352	250	250	601	606	99	101	80-120	1	15	

MATRIX SPIKE SAMPLE:	3085027						
		60392967005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	118	100	244	126	80-120	M1
Fluoride	mg/L	ND	2.5	3.1	116	80-120	
Sulfate	mg/L	223	100	354	131	80-120 I	V1

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.



#### QUALIFIERS

#### Project: AMEREN VS LCL1

Pace Project No.: 60392702

#### 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.



#### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:	AMEREN VS LCL1
Pace Project No .:	60392702

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60392702001	L-TMW-2	EPA 200.7	771128	EPA 200.7	771338
60392702002	L-MW-26	EPA 200.7	771128	EPA 200.7	771338
60392702003	L-LCL1-FB-1	EPA 200.7	771128	EPA 200.7	771338
60392702004	L-LCL1-DUP-1	EPA 200.7	771128	EPA 200.7	771338
60392702001	L-TMW-2	SM 2540C	771427		
60392702002	L-MW-26	SM 2540C	771427		
60392702003	L-LCL1-FB-1	SM 2540C	771427		
60392702004	L-LCL1-DUP-1	SM 2540C	771592		
60392702001	L-TMW-2	EPA 300.0	771702		
60392702002	L-MW-26	EPA 300.0	771702		
60392702003	L-LCL1-FB-1	EPA 300.0	771702		
60392702004	L-LCL1-DUP-1	EPA 300.0	772728		

		W0#:60392702
Pace DC#_Title: ENV-F	RM-LENE-0009_Samp	
INAUTICAL SERVICES Revision: 2	Effective Date: 01/12/20	60392702
Client Name: Golder		
Courier: FedEx UPS VIA Clay		Pace 🗆 Xroads 🗹 Client 🗆 Other 🗖
Tracking #:	Pace Shipping Label Used	l? Yes □ No □
Custody Seal on Cooler/Box Present: Yes Z No	□ Seals intact: Yes-₽	No 🗆
Packing Material: Bubble Wrap  Bubble B	Bags 🗆 💦 🔗 Foam 🗆	None Z Other 🗆
	ype of Ice: (Wet) Blue Nor	Date and initials of parson
Cooler Temperature (°C): As-read <u>I</u> Gorr	. Factor <u>0.2</u> Correct	ed (, 2 Date and initials of person examining contents: () 2-() 2-2
Temperature should be above freezing to 6°C O 7		0.5
Chain of Custody present:	∐Yes □No □N/A	
Chain of Custody relinquished:	Yes INO N/A	
Samples arrived within holding time:	Yes 🗆 No 🗆 N/A	
Short Hold Time analyses (<72hr):	□Yes ØNo □N/A	
Rush Turn Around Time requested:	□Yes ZNo □N/A	
Sufficient volume:	Yes DNO DN/A	
Correct containers used:		
	'	
Pace containers used:	Yes No N/A	
Containers intact:		
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 DNo DN/A	
Samples contain multiple phases? Matrix: G		
Containers requiring pH preservation in compliance?	Yes DNo DN/A	List sample IDs, volumes, lot #'s of preservative and the
(I INO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , I ICI<2; NaOI-I>9 Sulfide, NaOH>10 Cyanide)	5AIDS 1	date/time added.
Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	LOT#: JSITA	
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:	□Yes □No ØN/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		
	COC to Client? Y / N	Field Data Required? Y / N
	Date/Time:	
Comments/ Resolution:		

Project Manager Review:

ang!

Date:

Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

6 Secti Requi	Section A Required Client Information:	Section B Required Project Information:	ject Inf	lformatior	÷				v) 1	Section C	I C	C										Page:	-	o	~	
Company:	any: Golder Associates	Report To: Jeffrey Ingram	stfrey	, Ingran	6			1	È	Attention:		- 0-						-							-	
Address:	ss: 13515 Barrett Parkway Dr., Ste 260	Copy To: Eri	ic Sc	chniede	ir, Ryan	Feldm	Eric Schnieder, Ryan Feldman, Brend	dan Talbert		Company Name:	/ Name:		Golder Associates Inc	ociate	sinc						NONTO & MOUTA III MO					
	Baltwin, MO 63021									Address:								1					L			
Email To:	To: jeffrey ingram@golder.com	Purchase Order No.:	er No.	-1						Pace Quote	e .							L.	UST		RCRA		- lo -			Ľ
Phone:	© 636-724-9191 Fax 636-724-9323	Project Name:		meren -	Ameren - Verification Sampling	ation Se	ampling	-1211		Pace Project		amie C	Jamie Church					Sit	Site Location	По		Γ				
Seque	Requested Due Date/TAT: Standard	Project Number: 153140603	er: 15	531406	03					Pace Profile #:	44	9285, line 1	ne 1						STATE	щ	MO					
									11				ľ	F		Requ	ested	Analy	/sis Fi	Requested Analysis Filtered (Y/N)	(N/A					
	Section D Valid Matrix Codes Required Clent Information <u>MATRIX</u> <u>COI</u>	odes CODE		(-1)//		COLLECTED	CTED				Pr	Preservatives	atives		Z ↑N/A	z	z z	z	z z	z z	z					
	WATER WATER PRODUCT SOLSOLD	WT WY OL SC	See valid codes		COMPOSITE START	ART	COMPOSITE END/GRAB	SITE LAB	OLLECTION	S												(N/X)				
# WƏLI	Sample IDs MUST BE UNIQUE				DATE	TIME	DATE	TIME	SAMPLE TEMP AT C	# OF CONTAINER: Unpreserved	HNO <sup>3</sup> H <sup>5</sup> 20 <sup>4</sup>	HCI	NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Ionatham	- Other	<pre>test sisterst Phloride</pre>	-Iuoride	LDS	muiolsC	goron			Residual Chlorine	Par 6		Long Contect No. 1 and Contect Cool	
٢	2-mm2-7	WT	<u> </u>	U		-	2-10-22	09,55		- 2	-				_	1	_		-							
7	L-MW-20	WT	-	U		F	-	1220						F	-	-	H	-	-	-	-					
e	1-1611- FB-1	M	0 M	0				1230							+	-		-								
4	1-000-1727-7	M	WT G	U			_	1		-					-		-	-			-					
ŝ	L-LCLI - MS-I	N	0 F	U				0955							-			-								
ø	1-101-1 MSD-1	×	0 L	U			-	0955		TT					-		1	7								
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12		W	WT G	(7)						_					2.50											
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f 19					-	N 	IGNATUR	SIGNATURE of SAMPLER:	LER:	Rh	)	-⊰	The			MM/DD	gned (YY):	1/20	DATE Signed (MM/DD/YY): 02/11/22			пэТ	vieceN ()	poleuO		() dweS
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F-ALL-Q-020rev.08, 12-Oct-2007

"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.

# **\\**SI) GOLDER

#### **MEMORANDUM**

Project No. 153140604.0001

DATE March 2, 2022

TO Project File Golder Associates

- CC Amanda Derhake, Jeff Ingram
- **FROM** Annie Muehlfarth

EMAIL AMuehlfarth@golder.com

# DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – VERIFICATION SAMPLING - DATA PACKAGE 60392702

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

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

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Company Name: Golder Associates USA Inc / WSP	Project Manager: <u>J. Ingram</u>	
Project Name: Ameren- Labadie - LCL1	Project Number: 153140604	
Reviewer: A. Muehlfarth	Validation Date: 3/2/2022	
Laboratory: Pace Analytical Services - Kansas City Analytical Method (type and no.): EPA 200.7 (Total Metals), SM 2	SDG #: 60392702 2540C (TDS), EPA 300.0 (Anions)	
Matrix: Air Soil/Sed. Water Waste Sample Names L-TMW-2, L-MW-26, 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 I	nformation	YES	NO	NA	COMMENTS
a)	Sampling dates noted?	х			2/10/2022
b)	Sampling team indicated?	х			BTT
c)	Sample location noted?	х			
d)	Sample depth indicated (Soils)?			х	
e)	Sample type indicated (grab/composite)?	×			Grab
f)	Field QC noted?	×			See Notes
g)	Field parameters collected (note types)?	X			pH, Sp.Cond, ORP, Temp, DO, Turb
h)	Field Calibration within control limits?	×			
i)	Notations of unacceptable field conditions/performations	nces fr	om field lo	ogs or field	notes?
			×		
j)	Does the laboratory narrative indicate deficiencies?			X	
	Note Deficiencies:				
Chain-	of-Custody (COC)	YES	NO	NA	COMMENTS
a)	Was the COC properly completed?	X			
b)	Was the COC signed by both field				
6)	and laboratory personnel?	х			
c)	Were samples received in good condition?	х			
Gener	al (reference QAPP or Method)	YES	NO	NA	COMMENTS
a)	Were hold times met for sample pretreatment?	x			
,	Were hold times met for sample analysis?	×			
b)				_	
c)	Were the correct preservatives used?	X			
d)	Was the correct method used?	×			
e)	Were appropriate reporting limits achieved?	×			Cae Natae
f)	Were any sample dilutions noted?	×			See Notes
g)	Were any matrix problems noted?	x			See Notes

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Blanks		YES	NO	NA	COMMENTS
a)	Were analytes detected in the method blank(s)?		x		
b)	Were analytes detected in the field blank(s)?	х			See Notes
c)	Were analytes detected in the equipment blank(s)?			x	
d)	Were analytes detected in the trip blank(s)?			x	
Labora	tory 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			
Duplica	ates	YES	NO	NA	COMMENTS
a)	Were field duplicates collected (note original and du	plicate	sample n	ames)?	
		х			L-LCL1-DUP-1 @ L-TMW-2
b)	Were field dup. precision criteria met (note RPD)?		x		See Notes
c)	Were lab duplicates analyzed (note original and dup	olicate s	samples)?		
		х			
d)	Were lab dup. precision criteria met (note RPD)?	X			Max RPD: 5% [<10%]
Blind S	tandards	YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,			×	
	analytes included and concentrations)?				
b)	Was the %D within control limits?			х	
Matrix	Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a)	Was MS accuracy criteria met?		×		
	Recovery could not be calculated since sample contained high concentration of analyte?			х	
b)	Was MSD accuracy criteria met?		x		
	Recovery could not be calculated since sample contained high concentration of analyte?			X	
c)	Were MS/MSD precision criteria met?	X			

#### Comments/Notes:

Calcium, chloride, and sulfate analyzed at a dilution in multiple samples, no qualification necessary.

#### Blanks:

L-LCL1-FB-1 @ L-MW-26: Calcium (91.1J), associated sample result >RL and >10x blank, no qualification necessary.

#### Duplicates:

L-LCL1-DUP-1 @ L-TMW-2: RPD for TDS (24.8%) exceeds limit (20%). Fluoride detected in sample, ND in duplicate.

## **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

### Comments/Notes:

MS/MSD:

3079102/3079103: MS/MSD % recovery high for calcium. Associated with sample 60392702001, sample result >4x spike concentration, no qualification necessary.

3085027: MS % recovery high for chloride, sulfate. MS performed on unrelated sample, no qualification necessary.
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# **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

### Data Qualification:

	1			
Sample Name	Constituent(s)	Result	Qualifier	Reason
L-TMW-2	TDS	1360	J	Dup RPD exceeds limits
11	Fluoride	0.16	J	Detected in sample, ND in dup
L-LCL1-DUP-1	TDS	1060	J	Dup RPD exceeds limits
"	Fluoride	0.12	UJ	Detected in sample, ND in dup
		$\overline{}$		
		$\overline{}$		
	$1 \qquad M \qquad $	H-		
Signature:	Ann Muchto	TANI		Date: 3/2/2022
		· · · · · · · · · · · · · · · · · · ·		Daic.



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

June 05, 2022

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

RE: Project: AMEREN LEC LCL1 Pace Project No.: 60397403

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between April 08, 2022 and April 12, 2022. 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,

fami Church

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

Enclosures

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





### CERTIFICATIONS

Project: AMEREN LEC LCL1

Pace Project No.: 60397403

### **Pace Analytical Services Kansas**

9608 Loiret Boulevard, Lenexa, KS 66219 Missouri Inorganic Drinking Water Certification #: 10090 Arkansas Drinking Water Arkansas Certification #: 20-020-0 Arkansas Drinking Water Illinois Certification #: 2000302021-3 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-21-15 Utah Certification #: KS000212019-9 Illinois Certification #: 004592 Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070



### SAMPLE SUMMARY

Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60397403001	L-TMW-1	Water	04/11/22 12:56	04/12/22 04:53
60397403002	L-TMW-2	Water	04/11/22 11:07	04/12/22 04:53
60397403003	L-TMW-3	Water	04/11/22 14:38	04/12/22 04:53
60397403004	L-UWL-DUP-1	Water	04/11/22 08:00	04/12/22 04:53
60397403005	L-UWL-FB-1	Water	04/11/22 14:53	04/12/22 04:53
60397347006	L-MW-26	Water	04/07/22 13:41	04/08/22 05:28
60397347013	L-BMW-1S	Water	04/06/22 11:18	04/08/22 05:28
60397347014	L-BMW-2S	Water	04/06/22 13:27	04/08/22 05:28



### SAMPLE ANALYTE COUNT

Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60397403001	L-TMW-1	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SB2	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60397403002	L-TMW-2	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SB2	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60397403003	L-TMW-3	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SB2	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60397403004	L-UWL-DUP-1	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SB2	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60397403005	L-UWL-FB-1	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SB2	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60397347006	L-MW-26	EPA 200.7	JLH	7	PASI-K
		SM 2320B	KB	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	KB	3	PASI-K
60397347013	L-BMW-1S	EPA 200.7	JLH	7	PASI-K
		SM 2320B	KB	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60397347014	L-BMW-2S	EPA 200.7	JLH	7	PASI-K
		SM 2320B	KB	1	PASI-K
		SM 2540C	TNB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-TMW-1	Lab ID:	60397403001	Collecte	d: 04/11/22	2 12:56	Received: 04/	/12/22 04:53 Ma	atrix: Water		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	aration Meth	nod: EP	A 200.7				
	Pace Analytical Services - Kansas City									
Boron	114	ug/L	100	7.1	1	04/21/22 15:13	04/22/22 17:54	7440-42-8		
Calcium	165000	ug/L	200	38.2	1	04/21/22 15:13	04/25/22 16:40	7440-70-2		
Iron	38.5J	ug/L	50.0	21.1	1	04/21/22 15:13	04/22/22 17:54	7439-89-6		
Magnesium	40800	ug/L	50.0	11.7	1	04/21/22 15:13	04/22/22 17:54	7439-95-4		
Manganese	1510	ug/L	5.0	1.1	1	04/21/22 15:13	04/22/22 17:54	7439-96-5		
Potassium	5000	ug/L	500	224	1	04/21/22 15:13	04/22/22 17:54	7440-09-7		
Sodium	10100	ug/L	500	166	1	04/21/22 15:13	04/22/22 17:54	7440-23-5		
2320B Alkalinity	Analytical	Method: SM 23	320B							
	Pace Anal	ytical Services	- Kansas C	ity						
Alkalinity, Total as CaCO3	524	mg/L	20.0	4.6	1		04/20/22 11:22			
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C							
	Pace Anal	ytical Services	- Kansas C	ity						
Total Dissolved Solids	653	mg/L	10.0	10.0	1		04/15/22 16:10			
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0							
	Pace Anal	ytical Services	- Kansas C	ity						
Chloride	2.9	mg/L	1.0	0.53	1		04/27/22 22:10	16887-00-6	В	
Fluoride	0.21	mg/L	0.20	0.12	1		04/27/22 22:10	16984-48-8		
Sulfate	91.9	mg/L	10.0	5.5	10		04/27/22 22:24	14808-79-8		



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-TMW-2	Lab ID:	60397403002	Collected	1: 04/11/22	2 11:07	Received: 04/	12/22 04:53 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2 vtical Services	•		iod: EP	A 200.7			
Boron Calcium Iron Magnesium Manganese Potassium	110 220000 466 56300 3200 7050	ug/L ug/L ug/L ug/L ug/L ug/L	100 200 50.0 50.0 5.0 500	7.1 38.2 21.1 43.0 1.1 224	1 1 1 1 1	04/21/22 15:13 04/21/22 15:13 04/21/22 15:13 04/21/22 15:13 04/21/22 15:13 04/21/22 15:13	04/25/22 16:43 04/22/22 17:56 04/22/22 17:56	7440-70-2 7439-89-6 7439-95-4 7439-96-5 7440-09-7	M1
Sodium 2320B Alkalinity		ug/L Method: SM 23 ytical Services		166 ty	1	04/21/22 15:13	04/22/22 17:56	7440-23-5	
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids	,	mg/L Method: SM 25 ytical Services		4.6 ty	1		04/20/22 11:30		
Total Dissolved Solids 300.0 IC Anions 28 Days	,	mg/L Method: EPA 3 ytical Services		13.3 ty	1		04/15/22 16:10		
Chloride Fluoride Sulfate	11.9 <0.12 197	mg/L mg/L mg/L	1.0 0.20 20.0	0.53 0.12 11.0	1 1 20		04/27/22 22:37 04/27/22 22:37 04/28/22 00:01	16984-48-8	



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-TMW-3	Lab ID:	60397403003	Collected	d: 04/11/22	2 14:38	Received: 04/	12/22 04:53 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	nod: EP	A 200.7			
	Pace Anal	ytical Services	- Kansas C	ity					
Boron	116	ug/L	100	7.1	1	04/21/22 15:13	04/22/22 18:03	7440-42-8	
Calcium	141000	ug/L	200	38.2	1	04/21/22 15:13	04/25/22 17:00	7440-70-2	
Iron	735	ug/L	50.0	21.1	1	04/21/22 15:13	04/22/22 18:03	7439-89-6	
Magnesium	27700	ug/L	50.0	11.7	1	04/21/22 15:13	04/22/22 18:03	7439-95-4	
Manganese	241	ug/L	5.0	1.1	1	04/21/22 15:13	04/22/22 18:03	7439-96-5	
Potassium	6160	ug/L	500	224	1	04/21/22 15:13	04/22/22 18:03	7440-09-7	
Sodium	9550	ug/L	500	166	1	04/21/22 15:13	04/22/22 18:03	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
	Pace Anal	ytical Services	- Kansas C	ity					
Alkalinity, Total as CaCO3	469	mg/L	20.0	4.6	1		04/20/22 11:46		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
	Pace Anal	ytical Services	- Kansas Ci	ity					
Total Dissolved Solids	684	mg/L	10.0	10.0	1		04/15/22 16:11		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
-	Pace Anal	ytical Services	- Kansas Ci	ity					
Chloride	2.5	mg/L	1.0	0.53	1		04/28/22 00:56	16887-00-6	В
Fluoride	0.20J	mg/L	0.20	0.12	1		04/28/22 00:56	16984-48-8	
Sulfate	27.8	mg/L	10.0	5.5	10		04/28/22 01:10	14808-79-8	



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-UWL-DUP-1	Lab ID:	60397403004	Collected	d: 04/11/22	2 08:00	Received: 04/	12/22 04:53 Ma	atrix: Water		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	nod: EP	A 200.7				
	Pace Analytical Services - Kansas City									
Boron	113	ug/L	100	7.1	1	04/21/22 15:13	04/22/22 18:05	7440-42-8		
Calcium	169000	ug/L	200	38.2	1	04/21/22 15:13	04/25/22 17:03	7440-70-2		
Iron	211	ug/L	50.0	21.1	1	04/21/22 15:13	04/22/22 18:05	7439-89-6		
Magnesium	40800	ug/L	50.0	11.7	1	04/21/22 15:13	04/22/22 18:05	7439-95-4		
Manganese	2290	ug/L	5.0	1.1	1	04/21/22 15:13	04/22/22 18:05	7439-96-5		
Potassium	4990	ug/L	500	224	1	04/21/22 15:13	04/22/22 18:05	7440-09-7		
Sodium	10200	ug/L	500	166	1	04/21/22 15:13	04/22/22 18:05	7440-23-5		
2320B Alkalinity	Analytical	Method: SM 23	320B							
	Pace Anal	ytical Services	- Kansas C	ity						
Alkalinity, Total as CaCO3	527	mg/L	20.0	4.6	1		04/20/22 11:53			
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C							
	Pace Anal	ytical Services	- Kansas Ci	ity						
Total Dissolved Solids	603	mg/L	10.0	10.0	1		04/15/22 16:11			
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0							
•	Pace Anal	ytical Services	- Kansas Ci	ity						
Chloride	2.9	mg/L	1.0	0.53	1		04/28/22 01:24	16887-00-6	В	
Fluoride	0.23	mg/L	0.20	0.12	1		04/28/22 01:24	16984-48-8		
Sulfate	90.4	mg/L	10.0	5.5	10		04/28/22 01:38	14808-79-8		



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-UWL-FB-1	Lab ID:	60397403005	Collected	d: 04/11/22	2 14:53	Received: 04/	12/22 04:53 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2 ytical Services	•		iod: EP/	A 200.7			
Boron Calcium Iron Magnesium Manganese Potassium	<7.1 <71.3 <21.1 <11.7 <1.1 <224	ug/L ug/L ug/L ug/L ug/L ug/L	100 200 50.0 50.0 5.0 500	7.1 71.3 21.1 11.7 1.1 224	1 1 1 1 1	04/21/22 15:13 04/21/22 15:13 04/21/22 15:13 04/21/22 15:13 04/21/22 15:13 04/21/22 15:13	04/22/22 18:07 04/22/22 18:07 04/22/22 18:07	7440-70-2 7439-89-6 7439-95-4 7439-96-5 7440-09-7	
Sodium 2320B Alkalinity	Pace Anal	ug/L Method: SM 23 ytical Services	- Kansas C	,	1	04/21/22 15:13	04/22/22 18:07	7440-23-5	
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids		mg/L Method: SM 25 ytical Services		4.6 ity	1		04/20/22 12:12		
Total Dissolved Solids 300.0 IC Anions 28 Days	,	mg/L Method: EPA 3 ytical Services		5.0 ity	1		04/15/22 16:11		
Chloride Fluoride Sulfate	0.62J <0.12 <0.55	mg/L mg/L mg/L	1.0 0.20 1.0	0.53 0.12 0.55	1 1 1		04/28/22 01:51 04/28/22 01:51 04/28/22 01:51	16887-00-6 16984-48-8 14808-79-8	В



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-MW-26	Lab ID:	60397347006	Collected	d: 04/07/22	2 13:41	Received: 04/	/08/22 05:28 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2 ytical Services	•		nod: EP/	A 200.7			
Boron Calcium Iron Magnesium Manganese Potassium	96.8J 140000 <23.9 26300 115 4040	ug/L ug/L ug/L ug/L ug/L ug/L	100 200 50.0 50.0 5.0 500	13.5 38.2 23.9 43.0 3.8 167	1 1 1 1 1	04/19/22 13:10 04/19/22 13:10 04/19/22 13:10 04/19/22 13:10 04/19/22 13:10 04/19/22 13:10	04/21/22 19:06 04/21/22 19:06 04/21/22 19:06 04/21/22 19:06 04/21/22 19:06	7440-70-2 7439-89-6 7439-95-4 7439-96-5 7440-09-7	
Sodium 2320B Alkalinity		ug/L Method: SM 23 ytical Services		64.8 ity	1	04/19/22 13:10	04/21/22 19:06	7440-23-5	
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids	,	mg/L Method: SM 25 ytical Services		4.6 ity	1		04/16/22 08:41		
Total Dissolved Solids 300.0 IC Anions 28 Days		mg/L Method: EPA 3 ytical Services		10.0 ity	1		04/14/22 16:03		
Chloride Fluoride Sulfate	5.9 <0.12 29.0	mg/L mg/L mg/L	1.0 0.20 2.0	0.53 0.12 1.1	1 1 2		04/20/22 19:02 04/20/22 19:02 04/20/22 19:16	16984-48-8	



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-BMW-1S	Lab ID:	60397347013	Collecte	d: 04/06/22	2 11:18	Received: 04/	08/22 05:28 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2	•		nod: EP/	A 200.7			
	Pace Anal	ytical Services	- Kansas C	ity					
Boron	109	ug/L	100	13.5	1	04/19/22 13:10	04/21/22 19:39	7440-42-8	
Calcium	221000	ug/L	200	38.2	1	04/19/22 13:10	04/21/22 19:39	7440-70-2	
Iron	24800	ug/L	50.0	23.9	1	04/19/22 13:10	04/21/22 19:39	7439-89-6	
Magnesium	53100	ug/L	50.0	43.0	1	04/19/22 13:10	04/21/22 19:39	7439-95-4	
Manganese	2740	ug/L	5.0	3.8	1	04/19/22 13:10	04/21/22 19:39	7439-96-5	
Potassium	5920	ug/L	500	167	1	04/19/22 13:10	04/21/22 19:39	7440-09-7	
Sodium	20700	ug/L	500	64.8	1	04/19/22 13:10	04/21/22 19:39	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
	Pace Anal	ytical Services	- Kansas C	ity					
Alkalinity, Total as CaCO3	<4.6	mg/L	20.0	4.6	1		04/16/22 07:31		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
	Pace Anal	ytical Services	- Kansas C	ity					
Total Dissolved Solids	828	mg/L	10.0	10.0	1		04/14/22 16:02		H1
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
	Pace Anal	ytical Services	- Kansas C	ity					
Chloride	2.5	mg/L	1.0	0.53	1		04/26/22 22:09	16887-00-6	В
Fluoride	0.20J	mg/L	0.20	0.12	1		04/26/22 22:09	16984-48-8	
Sulfate	38.6	mg/L	10.0	5.5	10		04/26/22 22:23	14808-79-8	



### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

Sample: L-BMW-2S	Lab ID:	60397347014	Collected	: 04/06/22	2 13:27	Received: 04/	08/22 05:28 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2 ytical Services	•		nod: EP/	A 200.7			
Boron Calcium Iron Magnesium Manganese Potassium	55.2J 138000 <23.9 20900 6.4 5790 4240	ug/L ug/L ug/L ug/L ug/L ug/L	100 200 50.0 50.0 5.0 500	13.5 38.2 23.9 43.0 3.8 167	1 1 1 1 1	04/19/22 13:10 04/19/22 13:10 04/19/22 13:10 04/19/22 13:10 04/19/22 13:10 04/19/22 13:10	04/21/22 19:41 04/21/22 19:41 04/21/22 19:41	7440-70-2 7439-89-6 7439-95-4 7439-96-5 7440-09-7	
Sodium 2320B Alkalinity		ug/L Method: SM 23 ytical Services	- Kansas Cit	,	1	04/19/22 13:10	04/21/22 19:41	7440-23-5	
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids		mg/L Method: SM 25 ytical Services		4.6 y	1		04/16/22 07:35		
Total Dissolved Solids 300.0 IC Anions 28 Days		mg/L Method: EPA 3 ytical Services		10.0 y	1		04/14/22 16:02		H1
Chloride Fluoride Sulfate	2.5 0.19J 45.7	mg/L mg/L mg/L	1.0 0.20 5.0	0.53 0.12 2.8	1 1 5		04/26/22 22:37 04/26/22 22:37 04/27/22 10:05		В



Project: AMEREN LEC LCL1

Pace Project No.: 60397403

QC Batch:	782070	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
		Laboratory:	Pace Analytical Services - Kansas City
Associated Lab Sam	ples: 60397347006, 60397347013, 6	0397347014	

METHOD BLANK: 31191	06	Matrix:	Water			
Associated Lab Samples:	60397347006, 60397347013,	60397347014				
		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<13.5	100	13.5	04/21/22 18:32	
Calcium	ug/L	<38.2	200	38.2	04/21/22 18:32	
Iron	ug/L	<23.9	50.0	23.9	04/21/22 18:32	
Magnesium	ug/L	<43.0	50.0	43.0	04/21/22 18:32	
Manganese	ug/L	<3.8	5.0	3.8	04/21/22 18:32	
Potassium	ug/L	<167	500	167	04/21/22 18:32	
Sodium	ug/L	<64.8	500	64.8	04/22/22 11:39	

### LABORATORY CONTROL SAMPLE: 3119107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1020	102	85-115	
Calcium	ug/L	10000	10400	104	85-115	
Iron	ug/L	10000	9940	99	85-115	
Magnesium	ug/L	10000	10400	104	85-115	
Manganese	ug/L	1000	1060	106	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Sodium	ug/L	10000	9980	100	85-115	

MATRIX SPIKE & MATRIX SP		LICATE: 3119	108 MS	MSD	3119109							
Parameter	Units	60397347001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qua
Boron	ug/L	3330	1000	1000	4050	4310	71	97	70-130	6	20	
Calcium	ug/L	69700	10000	10000	74400	78800	47	91	70-130	6	20	M1
Iron	ug/L	<23.9	10000	10000	9200	9670	92	97	70-130	5	20	
Magnesium	ug/L	89.9	10000	10000	9540	10000	94	100	70-130	5	20	
Manganese	ug/L	<3.8	1000	1000	970	1020	97	102	70-130	5	20	
Potassium	ug/L	9260	10000	10000	17900	18900	86	96	70-130	5	20	
Sodium	ug/L	64000	10000	10000	68200	72400	42	84	70-130	6	20	M1
MATRIX SPIKE SAMPLE:		3119110										
			60397	7347011	Spike	MS		MS	% Rec			
Parameter		Units	Re	esult	Conc.	Result	%	6 Rec	Limits		Quali	fiers
Boron		ug/L		<13.5	1000	1	030	102	70	-130		
Calcium		ug/L		<38.2	10000	10	300	103	70	-130		

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**



Project: AMEREN LEC LCL1

Pace Project No.: 60397403

MATRIX SPIKE SAMPLE:	3119110						
		60397347011	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Iron	ug/L	<23.9	10000	9670	97	70-130	
Magnesium	ug/L	<43.0	10000	10300	103	70-130	
Manganese	ug/L	<3.8	1000	1050	105	70-130	
Potassium	ug/L	<167	10000	9960	100	70-130	
Sodium	ug/L	<64.8	10000	9780	97	70-130	

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**



Project:	AMEREN LEC LCL1
1 10/000	

Pace Project No.: 60397403

QC Batch:	782602		Analysis Me	thod: E	PA 200.7		
QC Batch Method:	EPA 200.7		Analysis De	scription: 2	00.7 Metals, Tota	l	
			Laboratory:	F	ace Analytical Se	rvices - Kansas Cit	y
Associated Lab San	nples: 6039740300	1, 60397403002	2, 60397403003, (	60397403004, 6	60397403005		
METHOD BLANK:	3120948		Matrix	: Water			
Associated Lab San	nples: 6039740300	1,6039740300	2, 60397403003, (	60397403004, 6	60397403005		
			Blank	Reporting			
Daran	otor	l Inite	Pocult	Limit	MDI	Analyzed	Qualifiers

Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<7.1	100	7.1	04/22/22 17:27	
Calcium	ug/L	<38.2	200	38.2	04/22/22 17:27	
Iron	ug/L	<21.1	50.0	21.1	04/22/22 17:27	
Magnesium	ug/L	<11.7	50.0	11.7	04/22/22 17:27	
Manganese	ug/L	<1.1	5.0	1.1	04/22/22 17:27	
Potassium	ug/L	<224	500	224	04/22/22 17:27	
Sodium	ug/L	<166	500	166	04/22/22 17:27	

### LABORATORY CONTROL SAMPLE: 3120949

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L		1830	92	85-115	
Calcium	ug/L	20000	18900	94	85-115	
Iron	ug/L	20000	18900	95	85-115	
Magnesium	ug/L	20000	19000	95	85-115	
Manganese	ug/L	2000	1910	96	85-115	
Potassium	ug/L	20000	19100	95	85-115	
Sodium	ug/L	20000	19100	96	85-115	

			MS	MSD								
	6	0397479003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Boron	ug/L	2350	1000	1000	3370	3360	102	101	70-130	0	20	
Calcium	ug/L	105000	10000	10000	116000	116000	106	110	70-130	0	20	
Iron	ug/L	11200	10000	10000	21300	20900	101	97	70-130	2	20	
Magnesium	ug/L	20200	10000	10000	29400	29000	92	88	70-130	1	20	
Manganese	ug/L	1310	1000	1000	2340	2300	103	100	70-130	1	20	
Potassium	ug/L	5200	10000	10000	15500	15400	103	102	70-130	1	20	
Sodium	ug/L	17100	10000	10000	27700	27500	106	104	70-130	1	20	

MATRIX SPIKE & MATRIX SF	IKE DUPLI	CATE: 3120	952		3120953							
			MS	MSD								
	6	60397403002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	110	1000	1000	1080	1080	97	97	70-130	0	20	

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

### **REPORT OF LABORATORY ANALYSIS**



Project: AMEREN LEC LCL1

Pace Project No.: 60397403

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 3120	952		3120953							
Parameter	6 Units	0397403002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	220000	10000	10000	228000	226000	77	59	70-130	1	20	M1
Iron	ug/L	466	10000	10000	10000	10100	96	96	70-130	0	20	
Magnesium	ug/L	56300	10000	10000	65000	65000	87	87	70-130	0	20	
Manganese	ug/L	3200	1000	1000	4100	4150	90	95	70-130	1	20	
Potassium	ug/L	7050	10000	10000	17500	17400	105	104	70-130	0	20	
Sodium	ug/L	12500	10000	10000	22800	22900	103	104	70-130	0	20	

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



Project: A	MEREN LEC LO	CL1						
Pace Project No.: 6	0397403							
QC Batch:	781580		Analysis Me	thod:	SM 2320B			
QC Batch Method:	SM 2320B		Analysis De	scription:	2320B Alkalin	ity		
			Laboratory:		Pace Analytic	al Services	- Kansas C	lity
Associated Lab Samp	les: 6039734	7006, 6039734701	3, 60397347014					
METHOD BLANK: 3	117114		Matrix	Water				
Associated Lab Samp	les: 6039734	7006, 6039734701	3, 60397347014					
			Blank	Reporting				
Parame	ter	Units	Result	Limit	MDL	A	nalyzed	Qualifiers
Alkalinity, Total as Ca	03	mg/L	<4.6	20	.0	4.6 04/1	5/22 16:07	
LABORATORY CONT	ROL SAMPLE:	3117115						
			Spike	LCS	LCS	% Rec		
Parame	ter	Units	Conc	Result	% Rec	Limits	Qu	alifiers
Alkalinity, Total as Ca0	03	mg/L	500	496	99	90-	110	
SAMPLE DUPLICATE	: 3117116			_				
Damas	1	11-20-	60397346006	Dup	000		/lax	Qualifiant
Parame		Units	Result	Result	RPD		RPD	Qualifiers
Alkalinity, Total as Ca	03	mg/L	408	40	06	0	10	
SAMPLE DUPLICATE	: 3117118			_		-		
Parame	tor	Units	60397347001 Result	Dup Result	RPD		/lax RPD	Qualifiers
								Quaimers
Alkalinity, Total as CaC	203	mg/L	34.3	35	.0	2	10	

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



Project:	AMEREN LEC	LCL1						
Pace Project No.:	60397403							
QC Batch:	782260		Analysis M	ethod:	SM 2320B			
QC Batch Method:	SM 2320B		Analysis De	escription:	2320B Alkalin	ity		
			Laboratory	:	Pace Analytic	al Services - Ka	ansas C	ity
Associated Lab Sam	nples: 603974	03001, 60397403002	2, 60397403003,	60397403004,	60397403005	5		
METHOD BLANK:	3119662		Matri	x: Water				
Associated Lab Sam	nples: 603974	03001, 60397403002	2, 60397403003,	60397403004,	60397403005	5		
			Blank	Reporting				
Param	neter	Units	Result	Limit	MDL	Analy	/zed	Qualifiers
Alkalinity, Total as C	aCO3	mg/L	<4.6	- 5 20	.0	4.6 04/20/22	2 10:52	
LABORATORY CON	ITROL SAMPLE	: 3119663						
			Spike	LCS	LCS	% Rec		
Param	neter	Units	Conc.	Result	% Rec	Limits	Qua	alifiers
Alkalinity, Total as C	aCO3	mg/L	500	475	95	90-110		
SAMPLE DUPLICAT	TE: 3119664							
			60397403002	- 1		Max		
Param	neter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as C	aCO3	mg/L	620	) 62	22	0	10	
SAMPLE DUPLICAT	TE: 3119665							
			60397347017	•		Max		
Param	neter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as C	aCO3	mg/L	139	9 13	37	1	10	

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



- <b>,</b>	VEREN LEC LO	CL1							
Pace Project No.: 60	397403								
QC Batch: 7	'81487		Analysis Me	ethod:	SM 2540C				
QC Batch Method: S	SM 2540C		Analysis De	scription:	2540C Total [	Dissolve	ed Solids		
			Laboratory:		Pace Analytic	al Serv	ices - Kar	sas Cit	у
Associated Lab Sample	es: 60397347	7006, 6039734701	3, 60397347014						
METHOD BLANK: 31	16838		Matrix	: Water					
Associated Lab Sample	es: 60397347	7006, 6039734701	3, 60397347014						
			Blank	Reporting					
Paramete	er	Units	Result	Limit	MDL		Analyz	ed	Qualifiers
Total Dissolved Solids		mg/L		5.	.0	5.0	04/14/22	16:01	
LABORATORY CONTR	ROL SAMPLE:	3116839							
			Spike	LCS	LCS	%	Rec		
Paramete	er	Units	Conc.	Result	% Rec	Lii	mits	Qual	ifiers
Total Dissolved Solids		mg/L	1000	891	89		80-120		
SAMPLE DUPLICATE:	3116840		60397347029	Dup			Max		
Paramete	er	Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Solids		mg/L							
Iotal Dissolved Solids		mg/∟	14.0	11.	.0	24			,
SAMPLE DUPLICATE:	3116841								
			60397347030	Dup			Max		
Paramete	er	Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Solids		mg/L	795	78	34	1		10	

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



Project:	AMERI	EN LEC LC	L1							
Pace Project No.:	603974	103								
QC Batch:	78172	21		Analysis M	lethod:	SM 2540C				
QC Batch Method:	SM 2	540C		Analysis D	escription:	2540C Total	Dissolv	ed Solids		
				Laboratory	/:	Pace Analytic	cal Ser	vices - Kai	nsas C	ity
Associated Lab Sar	nples:	60397403	001, 6039740300	2, 60397403003	, 60397403004	, 6039740300	5			
METHOD BLANK:	311770	5		Matri	ix: Water					
Associated Lab Sar	nples:	60397403	001, 6039740300	2, 60397403003	, 60397403004	, 6039740300	5			
				Blank	Reporting					
Parar	neter		Units	Result	Limit	MDL		Analyz	zed	Qualifiers
Total Dissolved Soli	ds		mg/L		0	5.0	5.0	04/15/22	16:10	
			ů.							
LABORATORY CO	NTROLS	SAMPLE:	3117706							
				Spike	LCS	LCS	%	6 Rec		
Parar	neter		Units	Conc.	Result	% Rec	L	imits	Qua	alifiers
Total Dissolved Soli	ds		mg/L	1000	873	87		80-120		
SAMPLE DUPLICA	TE: 31	17707								
_				60397403002				Max		
Parar	neter		Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Soli	ds		mg/L	97	5 9	39	4		10	
SAMPLE DUPLICA	TE: 31	17708								
				60397683001	- 1			Max		
Parar	neter		Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Soli	ds		mg/L	374	4 3	63	3		10	

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



QC Batch: 782	267		Analy	sis Meth	nod:	EPA 300.0						
	300.0		-		cription:	300.0 IC Ani	ons					
			-	atory:		Pace Analyt		vices - Kans	sas City			
Associated Lab Samples:	603973470	06		,		,			,			
METHOD BLANK: 31197	'18			Matrix:	Water							
Associated Lab Samples:	603973470	06										
Parameter		Units	Blan Resu		Reporting Limit	MDL	-	Analyze	ed Qi	ualifiers	;	
Chloride		mg/L		<0.53	1	.0	0.53	04/20/22 0	8:07			
Fluoride		mg/L		<0.12	0.2	20	0.12	04/20/22 0	8:07			
Sulfate		mg/L		<0.55	1	.0	0.55	04/20/22 0	8:07			
METHOD BLANK: 31210	)96			Matrix:	Water							
Associated Lab Samples:	603973470	06										
			Blan	k	Reporting							
Parameter		Units	Resu	ılt	Limit	MDL	-	Analyze	ed Qi	ualifiers	5	
Chloride		mg/L		<0.53	1	.0	0.53	04/21/22 0	9:52			
Fluoride		mg/L		<0.12	0.2	20	0.12	04/21/22 0	9:52			
Sulfate		mg/L		<0.55	1	.0	0.55	04/21/22 0	9:52			
		-										
LABORATORY CONTROL	. SAMPLE:	3119719										
LABORATORY CONTROL	. SAMPLE:	3119719 Units	Spike Conc.		LCS	LCS % Rec		Rec imits	Qualifiers			
Parameter	SAMPLE:	Units	Conc.	R	esult	% Rec	Li	imits	Qualifiers			
Parameter	SAMPLE:	Units mg/L	Conc.	 5		% Rec 94	Li •		Qualifiers			
LABORATORY CONTROL Parameter Chloride Fluoride Sulfate	SAMPLE:	Units	Conc. 2.	 5	4.7	% Rec	 + 3	imits 90-110	Qualifiers			
Parameter Chloride Fluoride Sulfate		Units mg/L mg/L mg/L	Conc. 2.	 5 5	4.7 2.6	% Rec 94 103	 + 3	imits 90-110 90-110	Qualifiers	_		
Parameter Chloride Fluoride Sulfate		Units mg/L mg/L	Conc. 2.	R 5 5 5	4.7 2.6	% Rec 94 103	Li	imits 90-110 90-110	Qualifiers	_		
Parameter Chloride Fluoride Sulfate		Units mg/L mg/L mg/L	Conc.	5 5 5	4.7 2.6 4.9	% Rec 94 103 99	Li 3 9	imits 90-110 90-110 90-110	Qualifiers			
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter		Units mg/L mg/L mg/L 3121097	Conc.	5 5 5	4.7 2.6 4.9	% Rec 94 103 99 LCS	Li	imits 90-110 90-110 90-110				
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride		Units mg/L mg/L mg/L 3121097 Units	Conc.	R 5	LCS	% Rec 94 103 99 LCS % Rec	LL 3 9 - LL - LL	imits 90-110 90-110 90-110 90-110		_		
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL		Units mg/L mg/L mg/L 3121097 Units mg/L	Spike Conc.	R 5	LCS 4.5 4.7 2.6 4.9	% Rec 94 103 99 LCS % Rec 91	Li 3 ) 	imits 90-110 90-110 90-110 90-110 90-110				
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride	SAMPLE:	Units mg/L mg/L mg/L 3121097 Units mg/L mg/L mg/L	Spike Conc	R 5 5 5 5 7 7 7 7 7 7 7 7 7 7	LCS 4.5 2.6 4.9 LCS 2.5	% Rec 94 103 99 LCS % Rec 91 100 95	Li 3 ) 	imits 90-110 90-110 90-110 90-110 90-110 90-110				
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate	SAMPLE:	Units mg/L mg/L 3121097 Units mg/L mg/L mg/L mg/L	Conc. 2.5 Spike Conc. 2.5 720 MS	R 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	4.7 2.6 4.9 LCS tesult 4.5 2.5 4.7 311972	% Rec 94 103 99 LCS % Rec 91 100 95	Li	imits 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers			
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX	SAMPLE:	Units mg/L mg/L mg/L 3121097 Units mg/L mg/L mg/L mg/L mg/L	Conc. 2. Spike Conc. 2. 720 MS Spike	S 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	LCS 4.5 2.5 4.7 311972 MS	% Rec 94 103 99 LCS % Rec 91 100 95 1 MSD	Li 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers % Rec	_	Max	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX Parameter	SAMPLE:	Units mg/L mg/L 3121097 Units mg/L mg/L mg/L clCATE: 3119 60394153001 Result	Conc. 2.5 Spike Conc. 2.5 720 MS	R 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	4.7 2.6 4.9 LCS tesult 4.5 2.5 4.7 311972	% Rec 94 103 99 LCS % Rec 91 100 95	K	imits 90-110 90-110 90-110 0 Rec imits 90-110 90-110 90-110 90-110 90-110	Qualifiers % Rec Limits	RPD	RPD	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX	SAMPLE:	Units mg/L mg/L mg/L 3121097 Units mg/L mg/L mg/L mg/L mg/L	Conc. 2. Spike Conc. 2. 720 MS Spike	S 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	LCS LCS Lesult 4.5 2.5 4.7 311972 MS Result 0 246	% Rec 94 103 99 LCS % Rec 91 100 95 1 MSD Result 245	     	imits 90-110 90-110 90-110 0 Rec imits 90-110 90-110 90-110 90-110 90-110	Qualifiers Qualifiers % Rec Limits 35 80-120	1	RPD 15	

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

### **REPORT OF LABORATORY ANALYSIS**



7825 d: EPA Samples: K: 31206 Samples: rameter K: 31249 Samples: rameter	300.0 6039734701 30 6039734701 	13, 60397347014 13, 60397347014 Units mg/L mg/L mg/L 13, 60397347014 Units	Analy		rription: Water Reporting Limit 1 0.2 1	MD 0 20	ical Ser	Analyze 04/26/22 12 04/26/22 12	d Qu 2:57 2:57	ualifiers		
Samples: K: 31206 Samples: rrameter K: 31249 Samples:	6039734701 30 6039734701 	I3, 60397347014 Units mg/L mg/L mg/L 13, 60397347014	Blar Res	ratory: Matrix: <sup>-</sup> k ult -0.63J -0.12 <0.55	Water Reporting Limit 1. 0.2 1	Pace Analyt	0.53 0.12	Analyze 04/26/22 12 04/26/22 12	d Qu 2:57 2:57	ualifiers		
K: 31206 Samples: rameter K: 31249 Samples:	30 6039734701 	I3, 60397347014 Units mg/L mg/L mg/L 13, 60397347014	Blar Res	Matrix: hk ult 0.63J <0.12 <0.55	Water Reporting Limit 1. 0.2 1	MD 0 20	0.53	Analyze 04/26/22 12 04/26/22 12	d Qu 2:57 2:57	ualifiers		
Samples: rameter K: 31249 Samples:	6039734701 	Units mg/L mg/L mg/L 13, 60397347014	Res	nk ult 0.63J <0.12 <0.55	Reporting Limit 0.2 1	.0 20	0.53 0.12	04/26/22 12 04/26/22 12	2:57 2:57	ualifiers		
rameter K: 31249 Samples:	94	Units mg/L mg/L mg/L 13, 60397347014	Res	ult 0.63J <0.12 <0.55	Limit 1. 0.2 1.	.0 20	0.53 0.12	04/26/22 12 04/26/22 12	2:57 2:57	ualifiers		
K: 31249 Samples:	-	mg/L mg/L mg/L 13, 60397347014	Res	ult 0.63J <0.12 <0.55	Limit 1. 0.2 1.	.0 20	0.53 0.12	04/26/22 12 04/26/22 12	2:57 2:57	ualifiers		
Samples:	-	mg/L mg/L 13, 60397347014	Blar	<0.12 <0.55	0.2 1	20	0.12	04/26/22 12	2:57			
Samples:	-	mg/L mg/L 13, 60397347014	Blar	<0.55	1.							
Samples:	-	13, 60397347014	Blar			.0	0.55	04/26/22 12	2:57			
Samples:	-	·	Blar	Matrix:	Water							
	6039734701	·	Blar									
		·	Blar									
rameter		Units		nk	Reporting							
			Res	ult	Limit	MD	L	Analyze	d Qu	ualifiers		
		mg/L		0.61J	1	.0	0.53	04/27/22 09	9:06			
		mg/L		<0.12	0.2	20	0.12	04/27/22 09	9:06			
		mg/L		<0.55	1	.0	0.55	04/27/22 09	9:06			
CONTROL	SAMPLE: 3	3120631										
rameter		l Inits	Spike Conc						Qualifiers			
lance									Quaimers	_		
		-										
		mg/L			4.8			90-110				
	SAMDLE: 2	2124005										
JONTROL	SAMFLE. 3	124995	Spike		CS	LCS	9	6 Rec				
rameter		Units	Conc.			% Rec			Qualifiers			
		ma/l		5	4.8	9	 6	90-110		_		
		mg/L			4.9			90-110				
& MATRIX	SPIKE DUPLI	ICATE: 31206	32		3120633	3						
			MS	MSD Spike			MG	MGD	% Rec		Max	
eter	Units		•	Conc.	Result	Result			Limits	RPD		Qual
	mg/L	17.4	5		5 25.3	22.7	1	57 10	5 80-120	11	15	E,M1
	mg/L	0.16J	2.5			2.6	1	53 9		42		M1,R1
	CONTROL arameter & MATRIX eter	Arameter	CONTROL SAMPLE: 3120631          arameter       Units         mg/L       mg/L         mg/L       mg/L         mg/L       mg/L         mg/L       mg/L         control SAMPLE:       3124995         arameter       Units         mg/L       mg/L         mg/L       mg/L         mg/L       mg/L         mg/L       mg/L         mg/L       mg/L         mg/L       mg/L         mg/L       117.4         mg/L       0.16J	CONTROL SAMPLE: 3120631 arameter Units Conc. mg/L mg/L 2. mg/L 3. mg/L	CONTROL SAMPLE: 3120631arameterUnitsConc.mg/L5mg/L2.5mg/L5mg/L5CONTROL SAMPLE:3124995CONTROL SAMPLE:3124995arameterUnitsMg/L5mg/L5mg/L5mg/L5mg/L5mg/L5mg/L5mg/L5mg/L5mg/L5mg/L5eterUnitsmg/L17.4mg/L0.16J2.52.5	CONTROL SAMPLE: 3120631arameterUnitsSpike Conc.LCS Resultmg/L54.7 mg/Lmg/L54.7 2.5mg/L54.8CONTROL SAMPLE:3124995arameterUnitsSpike Conc.LCS Resultmg/L54.8mg/L54.8mg/L54.8mg/L54.8mg/L54.9& MATRIX SPIKE DUPLICATE:31206323120632eterUnitsResult Conc.Conc.Result Conc.mg/L17.45525.3mg/L0.16J2.52.54.0	CONTROL SAMPLE:         3120631         Spike         LCS         LCS           arameter         Units         Conc.         Result         % Rec           mg/L         5         4.7         94           mg/L         2.5         2.5         94           mg/L         5         4.7         94           mg/L         2.5         2.5         94           mg/L         5         4.8         91           CONTROL SAMPLE:         3124995         LCS         LCS           arameter         Units         Conc.         Result         % Rec           mg/L         2.5         2.5         100           mg/L         5         4.8         94           mg/L         2.5         2.5         100           mg/L         5         4.9         94           MS         MSD         Spike         MS           & MATRIX SPIKE DUPLICATE:         3120632         3120633           MS         MSD         Spike         Spike           60397347001         Spike         Spike         MS           mg/L         17.4         5         5         25.3         22.7	CONTROL SAMPLE:         3120631           trameter         Units         Conc.         Result         % Rec         L           mg/L         5         4.7         94         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90	CONTROL SAMPLE:         3120631         Spike         LCS         LCS         % Rec           trameter         Units         Mg/L         5         4.7         94         90-110           mg/L         2.5         2.5         99         90-110           mg/L         5         4.7         94         90-110           mg/L         5         4.8         97         90-110           CONTROL SAMPLE:         3124995         Spike         LCS         LCS         % Rec           crameter         Units         Conc.         Result         % Rec         Limits           mg/L         5         4.8         97         90-110           Spike         Conc.         Result         % Rec         Limits           mg/L         5         4.8         96         90-110           mg/L         2.5         2.5         100         90-110           mg/L         5         4.9         98         90-110           MS         MSD         MSD         MSD         MSD           eter         Units         Result         Conc.         Conc.         Result         % Rec         % Rec           mg/L	CONTROL SAMPLE:         3120631         Spike         LCS         LCS         LCS         Limits         Qualifiers           mameter         Units         5         4.7         94         90-110         Qualifiers           mg/L         2.5         2.5         99         90-110         Qualifiers           mg/L         5         4.8         97         90-110         Qualifiers           CONTROL SAMPLE:         3124995         Spike         LCS         LCS         % Rec         Limits         Qualifiers           crameter         Units         Spike         LCS         2.5         96         90-110         Qualifiers           mg/L         5         4.8         96         90-110         Qualifiers           mg/L         5         4.8         96         90-110         Qualifiers           mg/L         5         4.9         98         90-110         Qualifiers           mg/L         5         4.9         98         90-110         Qualifiers           wareter         60397347001         Spike         MSD         MSD         MSD         MSD           eter         Units         Result         Conc.         Conc.	CONTROL SAMPLE:         3120631         Spike mameter         LCS Conc.         LCS Result         % Rec % Rec         Limits Limits         Qualifiers           mg/L         5         4.7         94         90-110         Qualifiers         Qualifiers           mg/L         2.5         2.5         99         90-110         Qualifiers         Qualifiers           CONTROL SAMPLE:         3124995         Spike         LCS         LCS         % Rec         Limits         Qualifiers           mg/L         5         4.8         96         90-110         Qualifiers         Qualifiers           mg/L         5         4.8         96         90-110         Qualifiers         Qualifiers           mg/L         5         4.8         96         90-110         Qualifiers         Qualifiers           mg/L         5         4.9         98         90-110         Qualifiers         Qualifiers           & MATRIX SPIKE DUPLICATE:         3120632         3120633         MSD         MSD         MSD         MSD         % Rec         Limits         RPD           mg/L         17.4         5         5         25.3         22.7         157         105         80-120         11	CONTROL SAMPLE:         3120631         Spike Conc.         LCS Result         LCS % Rec         LCS Limits         Qualifiers           mg/L         5         4.7         94         90-110         Qualifiers         Qualifiers           mg/L         2.5         2.5         99         90-110         Qualifiers         Qualifiers           mg/L         5         4.8         97         90-110         Provide <ttr>         CONTROL SAMPLE:         3124995         Spike         LCS         LCS         % Rec         Limits         Qualifiers           mg/L         5         4.8         96         90-110         Provide<ttr>         mg/L         5         4.8         96         90-110           mg/L         2.5         2.5         100         90-110           mg/L         2.5         2.5         100         90-110           start         MSD         MSD         MSD         MSD           mg/L         5         4.9         98         90-110           &amp; MATRIX SPIKE DUPLICATE:         3120632         3120633           eter         Units         Conc.         Result         Result         % Rec         Limits         RPD         Max</ttr></ttr>

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**



Project: AMEREN LEC LCL1

Pace Project No.: 60397403

SAMPLE DUPLICATE: 3120634						
		60397347001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	17.4	17.5	0	15	
Fluoride	mg/L	0.16J	<0.12		15	
Sulfate	mg/L	263	266	1	15	

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

### **REPORT OF LABORATORY ANALYSIS**



QC Batch: 783	373		Analy	sis Metho	d. E	EPA 300.0						
	300.0		-	sis Descri		300.0 IC Ani	000					
	300.0		-	atory:	•			vices - Kans	oo City			
Associated Lab Samples:	6039740300	1, 6039740300				-		VICES - Maris	as City			
		,										
METHOD BLANK: 3123				Matrix: W			_					
Associated Lab Samples:	6039740300	1, 6039740300				6039740300	15					
Parameter		Units	Blan Resu		Reporting Limit	MDL		Analyze	d Qi	ualifiers		
Chloride		mg/L		0.61J	1.0		0.53	04/27/22 1				
Fluoride		mg/L		<0.12	0.20		0.00	04/27/22 1				
Sulfate		mg/L		<0.55	1.0		0.55	04/27/22 1				
METHOD BLANK: 31270	155			Matrix: W	/ater							
Associated Lab Samples:		1, 6039740300				5039740300	5					
Lab Gampios.	0000140000	1,0000140000	2, 0039740. Blan		Reporting							
Parameter		Units	Resu		Limit	MDL		Analyze	ed Qu	ualifiers		
Chloride		mg/L		0.60J	1.(	 )	0.53	04/28/22 0	9:00			
Fluoride		mg/L		<0.12	0.20	)	0.12	04/28/22 0	9:00			
Sulfate		mg/L		<0.55	1.0	)	0.55	04/28/22 0	9:00			
LABORATORY CONTROL	SAMPLE: 3	123954										
	SAMPLE: 3 <sup>.</sup>		Spike	LC		LCS		Rec	Qualifiera			
LABORATORY CONTROL Parameter	SAMPLE: 3	Units	Conc.	Re	sult	% Rec	L	imits	Qualifiers			
Parameter	. SAMPLE: 3'	Units mg/L	Conc.	Re: 5	sult	% Rec 100	L	imits 90-110	Qualifiers			
Parameter Chloride Fluoride	SAMPLE: 3	Units mg/L mg/L	2.4	Re: 5 5	5.0 2.5	% Rec 100 101	L	imits 90-110 90-110	Qualifiers			
Parameter Chloride Fluoride	_ SAMPLE: 3 <sup>,</sup>	Units mg/L	2.4	Re: 5	sult	% Rec 100	L	imits 90-110	Qualifiers			
Parameter Chloride Fluoride Sulfate		Units mg/L mg/L	Conc.	Re: 5 5 5	5.0 2.5 4.9	% Rec 100 101 99	L	imits 90-110 90-110 90-110	Qualifiers			
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL		Units mg/L mg/L mg/L 127056	Conc.	Re: 5 5 5 	sult 5.0 2.5 4.9	% Rec 100 101 99 LCS	L	imits 90-110 90-110 90-110		_		
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Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride		Units mg/L mg/L mg/L 127056 Units mg/L mg/L	Spike Conc.		sult 5.0 2.5 4.9 CS sult 4.8 2.5	% Rec 100 101 99 LCS % Rec 95 100	L	imits 90-110 90-110 90-110 • Rec imits 90-110 90-110				
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride		Units mg/L mg/L mg/L 127056 Units mg/L	Spike Conc.		sult         5.0           2.5         4.9           CS         sult           4.8	% Rec 100 101 99 LCS % Rec 95	L	imits 90-110 90-110 90-110 90-110 90-110				
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride	3	Units mg/L mg/L mg/L 127056 Units mg/L mg/L mg/L	Spike Conc.		sult 5.0 2.5 4.9 CS sult 4.8 2.5	% Rec 100 101 99 LCS % Rec 95 100 97	L	imits 90-110 90-110 90-110 0 Rec imits 90-110 90-110				
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate	3	Units mg/L mg/L 127056 Units mg/L mg/L mg/L mg/L	Spike Conc. Conc. 2.5 2.5 8 2.5 8 8 955 MS		sult       5.0       2.5       4.9       Ssult       4.8       2.5       4.8       3123956	% Rec 100 101 99 LCS % Rec 95 100 97	L	imits 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers		Max	
Parameter Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate	3	Units mg/L mg/L mg/L 127056 Units mg/L mg/L mg/L	Spike Conc.		sult     5.0       2.5     4.9       2.5     4.9       2.5     4.9       2.5     4.8       2.5     4.8       4.8     4.8       4.8     4.8	% Rec 100 101 99 LCS % Rec 95 100 97	L	imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers % Rec		Max RPD	Qual
Parameter Chloride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX	SAMPLE: 3	Units mg/L mg/L mg/L 127056 Units mg/L mg/L mg/L CATE: 31239 60397403002 Result	Conc. 2. Spike Conc. 2. 255 MS Spike	Res 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Sult 5.0 2.5 4.9 SS Sult 4.8 2.5 4.8 3123956 MS Result	% Rec 100 101 99 LCS % Rec 95 100 97 MSD Result	L % L MS % Rec	imits 90-110 90-110 90-110 0 Rec imits 90-110 90-110 90-110 90-110 90-110	Qualifiers % Rec		RPD	Qua
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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**



Project: AMEREN LEC LCL1

Pace Project No.: 60397403

SAMPLE DUPLICATE: 3123957						
		60397403002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	11.9	11.9	0	15	
Fluoride	mg/L	<0.12	0.28		15	
Sulfate	mg/L	197	193	2	15	

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

### **REPORT OF LABORATORY ANALYSIS**



### QUALIFIERS

### Project: AMEREN LEC LCL1

Pace Project No.: 60397403

### 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.
- H1 Analysis conducted outside the EPA method holding time.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- R1 RPD value was outside control limits.



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LEC LCL1 Pace Project No.: 60397403

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60397347006	L-MW-26	EPA 200.7	782070	EPA 200.7	782144
60397347013	L-BMW-1S	EPA 200.7	782070	EPA 200.7	782144
60397347014	L-BMW-2S	EPA 200.7	782070	EPA 200.7	782144
60397403001	L-TMW-1	EPA 200.7	782602	EPA 200.7	782675
60397403002	L-TMW-2	EPA 200.7	782602	EPA 200.7	782675
60397403003	L-TMW-3	EPA 200.7	782602	EPA 200.7	782675
60397403004	L-UWL-DUP-1	EPA 200.7	782602	EPA 200.7	782675
60397403005	L-UWL-FB-1	EPA 200.7	782602	EPA 200.7	782675
60397347006	L-MW-26	SM 2320B	781580		
60397347013	L-BMW-1S	SM 2320B	781580		
60397347014	L-BMW-2S	SM 2320B	781580		
60397403001	L-TMW-1	SM 2320B	782260		
60397403002	L-TMW-2	SM 2320B	782260		
60397403003	L-TMW-3	SM 2320B	782260		
60397403004	L-UWL-DUP-1	SM 2320B	782260		
60397403005	L-UWL-FB-1	SM 2320B	782260		
60397347006	L-MW-26	SM 2540C	781487		
60397347013	L-BMW-1S	SM 2540C	781487		
60397347014	L-BMW-2S	SM 2540C	781487		
60397403001	L-TMW-1	SM 2540C	781721		
60397403002	L-TMW-2	SM 2540C	781721		
60397403003	L-TMW-3	SM 2540C	781721		
60397403004	L-UWL-DUP-1	SM 2540C	781721		
60397403005	L-UWL-FB-1	SM 2540C	781721		
60397347006	L-MW-26	EPA 300.0	782267		
60397347013	L-BMW-1S	EPA 300.0	782513		
60397347014	L-BMW-2S	EPA 300.0	782513		
60397403001	L-TMW-1	EPA 300.0	783373		
60397403002	L-TMW-2	EPA 300.0	783373		
60397403003	L-TMW-3	EPA 300.0	783373		
60397403004	L-UWL-DUP-1	EPA 300.0	783373		
60397403005	L-UWL-FB-1	EPA 300.0	783373		

			WO#:60397403
Pace	DC#_Title: ENV	-FRM-LENE-0009_Samp	ple Co 50397403
XMANYTERS SHOULES	Revision: 2	Effective Date: 01/12/20	022 Issued By: Lenexa
Client Name:()	ofder		
Courier: FedEx 🗆 UPS	U VIA D Clay		Pace 🗆 Xroads 💭 Client 🗆 Other 🗆
racking #:		Pace Shipping Label Use	d? Yes □ No □
Custody Seal on Cooler/Box	Present: Yes	No 🗆 🤅 Seals intact: Yes 🖉	No
•		e Bags 🗆 👘 Foam 🗆	None 🗆 Other 🗆
Thermometer Used: 1.3	201	Type of Ice: Wet Blue No	
Cooler Temperature (°C):	As-read 2 <u>·4/1· 7-</u> Co	orr. Factor - Correc	
emperature should be above free	zing to 6°C	-1.0	pv 4/12/22
Chain of Custody present:			
Chain of Custody relinquished:			
Samples arrived within holding	time:		
hort Hold Time analyses (<7	/2hr):		
Rush Turn Around Time requ	ested:		
ufficient volume:			
correct containers used:		11	
ace containers used:			
containers intact:			
npreserved 5035A / TX1005/1	006 soils frozen in 48	hrs? IYes No N/A	
iltered volume received for dis	solved tests?		
ample labels match COC: Dat	e / time / ID / analyses		
amples contain multiple phase	es? Matrix:		
containers requiring pH preserv			List sample IDs, volumes, lot #'s of preservative and t
HNO₃, H₂SO₄, HCl<2; NaOH>9 Su			date/time added.
Exceptions: VOA, Micro, O&G, KS yanide water sample checks:	FIPH, OK-DRO)	LOT#: 55/92	
ead acetate strip turns dark? (	• ·	□Yes □No	
otassium iodide test strip turns	s blue/purple? (Preserv	ve) 🛛 Yes 🖾 No	
rip Blank present:		□Yes □No ØN/A	
eadspace in VOA vials ( >6mr	n):	□Yes □No □N/A	
amples from USDA Regulated	Area: State:	□Yes □No □N/A	
dditional labels attached to 50		the field? □Yes □No ØN/A	
lient Notification/ Resolution		by COC to Client? Y / N	I Field Data Required? Y / N
erson Contacted:		Date/Time:	
omments/ Resolution:			
roject Manager Review:		 D_+t	
		Date	

Qualtrax Document ID: 30468

Face Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT, All relevant fields must be completed accurately.

Section A Required C	Section A Required Client information:	Section B Required Project Information:		Section C				Pa	Page: 1 of 1
Company:	Golder Associates	Report To: Jeffrey Ingram		Attention:	1				
Address;	701 Emerson Road, Suite 250	Copy To: Eric Schnieder, Rvan F	Eric Schnieder, Rvan Feldman. Brendan Talbert	Company Name:	Golder Associates 11SA Inc.				
	Creve Coerr Missouri 63111	. 1		-			REGULATORY AGENCY	AGENCY	
ł				Address:			L NPDES	GROUND WATER	ATER P DRINKING WATER
8	gram(	Purchase Order No.: COC #4		Pace Quote Reference			TSU -	RCRA	T OTHER
Phone:		Project Name: Ameren Labadie E	Ameren Labadie Energy Center LCL1	Pace Project J Manager	Jamie Church		Site Location		
Requeste	Requested Due Date/TAT: Standard	Project Number: 153140604, 0001		4.1	9285, line 3		STATE:	MO	
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1	L-MW-26	-				7 7 0			- race rroject No./ Lap I.D
2	L-TMW-1	MT G	4-11-22-1256			111	2011 2	2011	
n	L-TMW-2	MT G	4-11-22 1107	5				2	70 PR.N 3 RP 11
4	L-TMW-3	WT G		51					ha 143 - 10 - 10
чЛ	L-BMW-1S	WT G	1438				>		
9	L-BMW-2S	WT G							
2	L-UWL-DUP-1	WT G	152-11-H	5		111	-		
ø	L-UWL-FB-1	WT G	E2416241-H	- B		111			
თ	L-UWL-MS-1	WT G	H-11-22 1107			111	2		rollorka Q. IMU-2
10	L-UWL-MSD-1	WT G	1 Hali 22 1107	4		1111			C-Inviloreda -TMLI-2
11		WT G							
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Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Seci	Repo		uri, 63141		Fax 636-724-9323 Proje			Valid Matrix Codes MATRIX CODE	DRINKING WATER DW WATER WT WASTER WT PRODUCT P SOLUSOLID SL OLL OL		92-MM-7-41-01-5-	SI-Unit-1-Smu-15	SDGT L-BMW-25	S-DG-2	S-DG-3	S-DG-4	S-SCPC-DUP-1	S-SCPC-FB-1	S-BMW-1S	S-BMW-3S	S-SCPC-MS-1	S-SCPC-MSD-1	MENTS						
Section A Required Client Information:	Golder Associates	701 Emerson Road, Suite 250	Creve Coeur, Missouri, 63141	jeffrey ingram@golder.com	636-724-9191 Fax 6	Requested Due Date/TAT: Standard		Section D Required Client Information		SAMPLE ID (A-Z, 0-9/) Sample IDS MUST BE UNIQUE	J	TS.	T-S	I-S	S-I	S-I	S-SCP	S-SCI	S-BI	S-BA	S-SCF	S-SCP	ADDITIONAL COMMENTS	EPA 200.7: B, Ca, Fe, Mn, Mg, K, Na					
Section A Required C	Company:	Address:		Email To:	Phone: 6	equestec		S R		11EM #	÷	2		4	2	9	~	80	ი	9	11	12		PA 200		Pag	e 30	of	

"Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1,5% per month for any invoices not paid within 30 days.

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

# **\\**SI) GOLDER

# MEMORANDUM

Project No. 153140604.0001

### **DATE** June 7, 2022

TO Project File Golder Associates

- CC Amanda Derhake, Jeff Ingram
- **FROM** Annie Muehlfarth

### EMAIL ann.muehlfarth@wsp.com

# DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – DETECTION MONITORING - DATA PACKAGE 60397403

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

- When a compound was detected in a blank (i.e. method, field), and the blank comparison criterion was not met, associated sample results were qualified as estimates (J) or non-detects (U).
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When duplicate criterion was not met, the associated sample result was qualified as an estimate (J for detects, UJ for non-detects).
- When a compound was analyzed outside of hold time, associated sample results were qualified as estimates (J for detects, UJ for non-detects).

# **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Company Name: Golder Associates USA Inc	_ Project Manager: _ <sup>J. Ingram</sup>
Project Name: Ameren - LEC - LCL1	_ Project Number: _GL153140604.0001
Reviewer: <u>A. Muehlfarth</u>	Validation Date: 6/7/2022
Laboratory: Pace Analytical	SDG #:_60397403 SDG #:_6039740C (TDS); EPA 300.0 (Anions)

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

Field Ir	nformation	YES	NO	NA	COMMENTS
a)	Sampling dates noted?	х			4/6/2022 - 4/11/2022
b)	Sampling team indicated?	х			EMS/GTM/BTT
c)	Sample location noted?	x			
d)	Sample depth indicated (Soils)?			x	
e)	Sample type indicated (grab/composite)?	х			Grab
f)	Field QC noted?	х			See Notes
g)	Field parameters collected (note types)?	×			pH, Sp.Cond, ORP, Temp, DO, Turb
h)	Field Calibration within control limits?	х			
i)	Notations of unacceptable field conditions/performa	nces fro	om field lo	ogs or field no	ites?
			×		
j)	Does the laboratory narrative indicate deficiencies?			x	
	Note Deficiencies:				
Chain-	of-Custody (COC)	YES	NO	NA	COMMENTS
Chain- a)	of-Custody (COC) Was the COC properly completed?	YES	NO	NA	COMMENTS
			_		COMMENTS
a)	Was the COC properly completed?		_		COMMENTS
a)	Was the COC properly completed? Was the COC signed by both field	x			COMMENTS
a) b) c)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition?	X X X			
a) b) c)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel?	×			COMMENTS
a) b) c)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition?	X X X			
a) b) c) Genera	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition?	× × × YES			COMMENTS
a) b) c) Genera a)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Al (reference QAPP or Method) Were hold times met for sample pretreatment?	× × × YES	□ □ NO		COMMENTS See Notes
a) b) c) Genera a) b)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Al (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis?	× × YES	□ □ NO ×		COMMENTS See Notes
a) b) c) Genera a) b) c)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Al (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used?	× × YES	□ □ NO ×		COMMENTS See Notes
a) b) c) Genera a) b) c) d)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Al (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used? Was the correct method used?	× × YES	□ □ NO × □		COMMENTS See Notes

### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Blanks		YES	NO	NA	COMMENTS
a)	Were analytes detected in the method blank(s)?	х			See Notes
b)	Were analytes detected in the field blank(s)?	х			See Notes
c)	Were analytes detected in the equipment blank(s)?			x	
d)	Were analytes detected in the trip blank(s)?			x	
Labora	tory 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			
		VEO	No		
Duplica		YES	NO	NA	COMMENTS L-UWL-DUP-1 @ L-TMW-1
a)	Were field duplicates collected (note original and du	•		,	
		×			See Notes
b)	Were field dup. precision criteria met (note RPD)?		x		
c)	Were lab duplicates analyzed (note original and dup			_	
		х			See Notes
d)	Were lab dup. precision criteria met (note RPD)?		х		See Notes
Blind S	tandards	YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,			х	
,	analytes included and concentrations)?	_	_	—	
b)	Was the %D within control limits?			х	
Matrix \$	Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a)	Was MS accuracy criteria met?		х		See Notes
	Recovery could not be calculated since sample contained high concentration of analyte?			x	
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?		x		See Notes

### Comments/Notes:

TDS analyzed outside of hold time in samples -013 and -014. Results qualified as estimates.

Sulfate analyzed at a dilution in multiple samples, no qualification necessary.

### Blanks:

MB 3120630: Chloride (0.63J), associated with samples -013 and -014. Sample results >RL but <10x blank, qualified as estimates. MB 3124994: Chloride (0.61J), associated with samples -013 and -014. Sample results >RL but <10x blank, qualified as estimates.

### **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

### Comments/Notes:

MB 3123953: Chloride (0.61J), associated with samples -001 through -005. Results >RL but <10x blank were qualified as estimates. Results >10x blank and RL not qualified. Results >RL were reported at RL and qualified as estimates. MB 3127055: Chloride (0.60J), associated with samples -001 through -005. See notes above.

L-UWL-FB-1 @ L-TMW-3: TDS (5.0), chloride (0.62J). TDS result >10x blank and RL, no qualification necessary. Chloride result >RL but <10x blank, qualified as an estimate.

**Duplicates:** 

L-UWL-DUP-1 @ L-TMW-1: RPD exceeds limit (20%) for iron (138.3%) and manganese (41.1%).

Sample Duplicate 3116840: RPD exceeds limit (10%) fro TDS (24%). Performed on unrelated sample, no qualification necessary.

### MS/MSD:

3119108/3119109: MS % recovery low for calcium and sodium, MS/MSD performed on unrelated sample, no qualification necessary.

3120952/3120953: MSD % recovery low for calcium, associated with sample -002. Only 1 QC indicator outside of control limits, no qualification necessary.

3120632/3120633: MS % recovery high for chloride. MS % recovery and RPD high for fluoride. MS/MSD performed on unrelated sample, no qualification necessary.

<u>_</u>

# **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

# Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-BMW-1S	TDS	828	J	Analyzed outside of hold time
L-BMW-2S	"	513	J	n
L-BMW-1S	Chloride	2.5	J	Detected in MB, 10x blank > result > RL
L-BMW-2S	"	2.5	J	"
L-TMW-1	"	2.9	J	"
L-UWL-DUP-1	"	2.9	J	"
L-TMW-3	"	2.5	J	Detected in MB/FB, 10x blank > result > RI
L-UWL-FB-1	"	1.0	UJ	Detected in MB, RL>result>MDL
L-TMW-1	Iron	38.5	J	Dup RPD exceeds limit
"	Manganese	1510	J	"
L-UWL-DUP-1	Iron	211	J	п
"	Manganese	2290	J	n
	$\overline{}$			
		$\sim$		
		+		
				<u>_</u>
	- 1 MII	14-		
Signature:	_ Ann Much	Linh		6/7/2022



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

July 08, 2022

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

RE: Project: AMEREN VERIFICATION LCL1 Pace Project No.: 60403844

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on June 23, 2022. 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,

Parmi Church

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

Enclosures

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





#### CERTIFICATIONS

Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

#### **Pace Analytical Services Kansas**

9608 Loiret Boulevard, Lenexa, KS 66219 Missouri Inorganic Drinking Water Certification #: 10090 Arkansas Drinking Water Arkansas Certification #: 22-031-0 Arkansas Drinking Water Illinois Certification #: 2000302021-3 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-21-15 Utah Certification #: KS000212019-9 Illinois Certification #: 004592 Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070



## SAMPLE SUMMARY

#### Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60403844001	HOLD	Water	06/22/22 00:00	06/23/22 03:57
60403836010	L-TMW-2	Water	06/22/22 09:21	06/23/22 03:57
60403836011	L-LCL1-DUP-1	Water	06/22/22 08:00	06/23/22 03:57
60403836012	L-LCL1-FB-1	Water	06/22/22 09:36	06/23/22 03:57



### SAMPLE ANALYTE COUNT

Project:AMEREN VERIFICATION LCL1Pace Project No.:60403844

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60403836010	L-TMW-2	EPA 200.7	MA1	1	PASI-K
		SM 2540C	SK	1	PASI-K
		EPA 300.0	KB	2	PASI-K
60403836011	L-LCL1-DUP-1	EPA 200.7	MA1	1	PASI-K
		SM 2540C	SK	1	PASI-K
		EPA 300.0	KB	2	PASI-K
60403836012	L-LCL1-FB-1	EPA 200.7	MA1	1	PASI-K
		SM 2540C	SK	1	PASI-K
		EPA 300.0	KB	2	PASI-K

PASI-K = Pace Analytical Services - Kansas City



#### Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

Sample: L-TMW-2	Lab ID:	60403836010	Collected	: 06/22/22	2 09:21	Received: 06/	23/22 03:57 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepar	ation Meth	od: EP	A 200.7			
	Pace Anal	vtical Services	- Kansas Cit	y					
Calcium	215000	ug/L	200	33.7	1	06/28/22 02:41	07/07/22 16:31	7440-70-2	M1
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
	Pace Anal	vtical Services	- Kansas Cit	y					
Total Dissolved Solids	940	mg/L	13.3	13.3	1		06/29/22 11:26		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
-	Pace Anal	vtical Services	- Kansas Cit	y					
Chloride	10	mg/L	1.0	0.53	1		07/01/22 15:24	16887-00-6	
Sulfate	175	mg/L	10.0	5.5	10		07/01/22 16:19	14808-79-8	



#### Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

Sample: L-LCL1-DUP-1	Lab ID:	60403836011	Collected	: 06/22/22	2 08:00	Received: 06/	/23/22 03:57 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepar	ration Meth	od: EP	A 200.7			
	Pace Anal	ytical Services	<ul> <li>Kansas Cit</li> </ul>	ty					
Calcium	224000	ug/L	200	33.7	1	06/28/22 02:41	07/07/22 16:37	7440-70-2	
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
	Pace Anal	ytical Services	<ul> <li>Kansas Cit</li> </ul>	ty .					
Total Dissolved Solids	920	mg/L	13.3	13.3	1		06/29/22 11:27		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
	Pace Anal	ytical Services	<ul> <li>Kansas Cit</li> </ul>	iy					
Chloride	9.0	mg/L	1.0	0.53	1		07/06/22 10:23	16887-00-6	
Sulfate	166	mg/L	50.0	27.5	50		07/01/22 17:57	14808-79-8	



#### Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

Sample: L-LCL1-FB-1	Lab ID:	60403836012	Collected	1: 06/22/22	2 09:36	Received: 06/	/23/22 03:57 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
	Pace Anal	ytical Services	- Kansas Ci	ty					
Calcium	<33.7	ug/L	200	33.7	1	06/28/22 02:41	07/07/22 16:39	7440-70-2	
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C						
	Pace Anal	ytical Services	- Kansas Ci	ty					
Total Dissolved Solids	10.0	mg/L	5.0	5.0	1		06/29/22 11:27		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
-	Pace Anal	ytical Services	- Kansas Ci	ty					
Chloride	0.63J	mg/L	1.0	0.53	1		07/01/22 18:10	16887-00-6	В
Sulfate	<0.55	mg/L	1.0	0.55	1		07/01/22 18:10	14808-79-8	



Project: Pace Project No.:	AMEREN VERIFIC 60403844	ATION LCL1										
QC Batch:	794742		Analy	/sis Method	d: I	EPA 200.7						
QC Batch Method:	EPA 200.7			/sis Descri		200.7 Metal	s, Total					
			Labo	ratory:				/ices - Kansa	as City			
Associated Lab Sar	mples: 604038360	010, 6040383601	1, 6040383	6012								
METHOD BLANK:	3166167			Matrix: W	ater							
Associated Lab Sar	mples: 604038360	010, 6040383601	1, 6040383	6012								
			Blar	nk l	Reporting							
Parar	neter	Units	Res	ult	Limit	MD	-	Analyzed	d Qu	ualifiers		
Calcium		ug/L		<33.7	20	0	33.7	07/07/22 16	6:27			
LABORATORY CO	NTROL SAMPLE:	3166168										
LABORATORY CO	NTROL SAMPLE:	3166168	Spike	LC	S	LCS	%	Rec				
LABORATORY COI Parar		3166168 Units	Spike Conc.	LC Res	-	LCS % Rec		Rec mits	Qualifiers			
Parar			•	Res	-		Li		Qualifiers			
Parar Calcium		Units ug/L	Conc1000	Res	sult	% Rec 98	Li	mits	Qualifiers			
Parar Calcium	neter	Units ug/L	Conc1000	Res	9810	% Rec 98	Li	mits	Qualifiers			
Parar Calcium	neter	Units ug/L	- Conc. 1000	Res	9810	% Rec 98	Li	mits	Qualifiers		Max	
Calcium	neter MATRIX SPIKE DUP	Units ug/L LICATE: 3166	- Conc. 1000 169 MS	MSD	3166170	% Rec 9	Li	MSD		RPD	Max RPD	Qual

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.



Pace Project No.: 60403844	CATION LCL1						
QC Batch: 794977		Analysis Me	thod:	SM 2540C			
QC Batch Method: SM 2540C		Analysis De	scription:	2540C Total D	issolved Solids		
		Laboratory:		Pace Analytica	al Services - Kar	sas City	у
Associated Lab Samples: 604038360	010, 6040383601	1, 60403836012					
METHOD BLANK: 3167039		Matrix	: Water				
Associated Lab Samples: 604038360	010, 6040383601	1, 60403836012					
		Blank	Reporting				
Parameter	Units	Result	Limit	MDL	Analyz	ed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5	.0	5.0 06/29/22	11:26	
LABORATORY CONTROL SAMPLE:	3167040						
_		Spike	LCS	LCS	% Rec		
Parameter	Units	Conc.	Result	% Rec	Limits	Quali	ifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120		
SAMPLE DUPLICATE: 3167041							
		60403836007	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Total Dissolved Solids	mg/L	485	46	64	4	10	
SAMPLE DUPLICATE: 3167042							
Parameter	Units	60403836010 Result	Dup Result	RPD	Max RPD		Qualifiers
Total Dissolved Solids	mg/L	940	90	00	4	10	
SAMPLE DUPLICATE: 3167043							
		60403987001	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Total Dissolved Solids	mg/L	173	17	<u> </u>	2	10	

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#### **REPORT OF LABORATORY ANALYSIS**

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Project: Pace Project No.:	AMERE 6040384	-	ATION LCL1											
QC Batch:	79522	7		Analy	sis Metho	od:	EPA	300.0						
QC Batch Method:	EPA 30	0.0		Analy	/sis Descr	iption:	300.	0 IC Ani	ons					
				Labo	ratory:		Pace	e Analyti	cal Sei	rvices - Kansa	as City			
Associated Lab Sam	nples:	604038360	010, 6040383601	1, 6040383	6012									
METHOD BLANK:	3167864	Ļ			Matrix: W	Vater								
Associated Lab Sam	nples:	604038360	010, 6040383601	1, 6040383	6012									
				Blar	nk	Reporting	I							
Param	neter		Units	Res	ult	Limit		MDL		Analyzed	y 0	ualifiers		
Chloride			mg/L		0.62J		1.0		0.53	07/01/22 12	2:22			
Sulfate			mg/L		<0.55		1.0		0.55	07/01/22 12	2:22			
METHOD BLANK:	3172952	2			Matrix: W	Vater								
Associated Lab Sam	nples:	604038360	010, 6040383601	1, 6040383	6012									
				Blar		Reporting	1							
Param	neter		Units	Res	ult	Limit		MDL	-	Analyzed	y Q	ualifiers		
Chloride			mg/L		<0.53		1.0		0.53	07/06/22 09	):29			
Sulfate			mg/L		<0.55		1.0		0.55	07/06/22 09	):29			
LABORATORY CON	ITROL S	AMPLE:	3167865											
				Spike	LC	CS		CS	%	6 Rec				
Param	neter		Units	Conc.	Re	sult	%	Rec	L	_imits	Qualifiers			
Chloride			mg/L		5	4.8		96		90-110				
Sulfate			mg/L		5	4.9		98	3	90-110				
LABORATORY CON	NTROL S	AMPLE:	3172953											
_				Spike		CS		CS		6 Rec				
Param	neter		Units	Conc.		sult	%	Rec		_imits	Qualifiers			
Chloride			mg/L		5	4.6		91		90-110				
Sulfate			mg/L		5	4.8		95	5	90-110				
MATRIX SPIKE & M	ATRIX S	PIKE DUP	LICATE: 3167	868		31678	69							
				MS	MSD	• • •			•		o. –			
Parameter		Units	60403836010 Result	Spike Conc.	Spike Conc.	MS Result		ISD esult	MS % Re	MSD c % Rec	% Rec Limits	RPD	Max RPD	Qua
Chloride		mg/L	10	5	5	14.9	9	15.0	1	00 10	1 80-120	1	15	
Sulfate		mg/L	175	50	50			227	1	06 104				E

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.



#### Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

SAMPLE DUPLICATE: 3167870			_			
Parameter	Units	60403836010 Result	Dup Result	RPD	Max RPD	Qualifiers
						Quanners
Chloride	mg/L	10	10.2	2	15	
Sulfate	mg/L	175	177	1	15	

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

#### **REPORT OF LABORATORY ANALYSIS**

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#### QUALIFIERS

Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

#### 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.
- 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.



# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN VERIFICATION LCL1

Pace Project No.: 60403844

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60403836010	L-TMW-2	EPA 200.7	794742	EPA 200.7	794756
60403836011	L-LCL1-DUP-1	EPA 200.7	794742	EPA 200.7	794756
60403836012	L-LCL1-FB-1	EPA 200.7	794742	EPA 200.7	794756
60403836010	L-TMW-2	SM 2540C	794977		
60403836011	L-LCL1-DUP-1	SM 2540C	794977		
60403836012	L-LCL1-FB-1	SM 2540C	794977		
60403836010	L-TMW-2	EPA 300.0	795227		
60403836011	L-LCL1-DUP-1	EPA 300.0	795227		
60403836012	L-LCL1-FB-1	EPA 300.0	795227		

			WO#:60403836
Pace		RM-LENE-0009_Sam	60403836
	Revision: 2	Effective Date: 01/12/2	
Client Name: 66	ler		
Courier: FedEx  UPS	] VIA 🗆 Clay [		Pace 🗆 Xroads 🗹 Client 🗆 Other 🗅
Tracking #:		Pace Shipping Label Use	ad? Yes □ No 🗹
Custody Seal on Cooler/Box P	resent: Yes 🗹 No	□ Seals intact: Yes	
Ť .	Wrap 🗆 🛛 Bubble I	-	None D Other D tplc
Thermometer Used: T-J		ype of Ice: Wet Blue No	Date and initials of person (
Cooler Temperature (°C): As	s-read 3.4, 3.0 Cori	r. Factor <u>-1.0</u> Correc	examining contents: 625/22
Temperature should be above freezi	ng to 6°C		1
Chain of Custody present:		Tes No N/A	
Chain of Custody relinquished:		Yes No N/A	
Samples arrived within holding ti	me:	Tes No N/A	
Short Hold Time analyses (<72	?hr):	□Yes 🗖 No □N/A	
Rush Turn Around Time reque		□Yes 🗖 N/A	
Sufficient volume:		Yes No N/A	
Correct containers used:		Yes No N/A	
Pace containers used:			
Containers intact:			
Unpreserved 5035A / TX1005/10			
Filtered volume received for diss			
Sample labels match COC: Date		Yes No N/A	
Samples contain multiple phases			
Containers requiring pH preserva (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>9 Sulfi		Yes No N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(Exceptions: VOA, Micro, O&G, KS		LOT#: 55192	
Cyanide water sample checks:		Yes No	
Lead acetate strip turns dark? (R Potassium iodide test strip turns	.,		
		,	
Trip Blank present:			
Headspace in VOA vials ( >6mm		Yes No A	
Samples from USDA Regulated A		Yes No ATA	
Additional labels attached to 503			
Client Notification/ Resolution:		COC to Client? Y / N	Field Data Required? Y / N
Person Contacted: Comments/ Resolution:		Date/Time:	
Project Manager Review:		Date	e:

List Pace Workorder Number or	20	LAB USE ONLY	Lab Project Manager:	4) sodium hydroxide, (5) zinc acetate,	corbic acid, (b) ammonium sulfate,	LaD Profile/Line: Lab Sample Receipt Checklist:	ody Seals Present/Intact Y N NA	Signatures Present Y N r Signature Present Y N	N X N X	Samples Received on Ice Y N NA VOA - Headspace Acceptable Y N NA USDA Regulated Soils Y N NA	ime Y esent Y	table Y N	Sulfide Present Y N NA Lead Acetate Strips:	LAB USE ONLY: Lab Sample # / Comments:									Temp Blank Received: ON NA Therm ID#: T-219 Cooler 1 Temp Upon Receip24 3 AC	Cooler 1 Therm Corr. Factor-1.0 oC Cooler 1 Corrected Temp: 2.4 2.0 oC	Comments:		Trip Blank Received: Y N NA HCL MeOH TSP Other	Non Conformance(s): Page:
LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or	M I'IL LOG-IN NUMBER HERE	ALL SHADED AREAS are for LAB USE ONLY	Container Preservative Type **	Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, methanol (7) sodium kinifer (0) sodi	י Sodium miosuitate, (ש) nexan Unpreserved, (O) Other	Analyses Lab Proi	Custody	Custody Collect	Control	Samp VOA - USDA	Samples Residual C1 Stri	1	~~~~	کم اد :					4			SHORT HOLDS PRESENT (<72 hours): Y N N/A	Lab Tracking #: 2568344	Samples received via: FEDEX UPS Client Courier Pace Courier	Date/Time: MTJL LAB USE ONLY	- 6-25 1510 Table #:	0357	Date/Time: PM: PB:
CHAIN-OF-CUSTODY Analytical Request Document	Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields	Billing Information:	47	Email To: (4)	Site Collection Info/Address: (C)	·		Compliance Monitoring?	DW PWS ID #: DW Location Code:	d: Immediately Packed on Ice:	Y [i ] Yes	[ ] 5 Day Analysis:		Collected (or Composite End Res # of Composite Start)		1 6-27-22 0921 2 1	0136	1260	T 7 1260 T 1			Type of Ice Used: Wet Blue Dry None	Packing Material Used:	Radchem sample(s) screened (<500 cpm): Y N NA	Par la	lisio	1570	Time: Received by/Company: (Signature)
	ace Analytical	حماملے	· Rd, SKe 250, Geve Cours the 63(4)		Talland, E. Schneider	nber:	HOMOHISCI	ŗ	Collected By (print): T Purchase Order #:	Collected By (signature): Turnaround Date Required:	oosal: Rush: Rush: [] Same Day [] Same Day	I   Archive:	* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)	Customer Sample ID Matrix * Grab	-	31		r -1001 - ms-1	T-TCTI-m20-1			Customer Remarks / Special Conditions / Possible Hazards:	- 1		Relinquished by/Company: (Signature) Date/Time:	()	Participanti e a provintante alguarare participante a provintante a prov	Nerriquisried by/ company: (signature)

H6							
H6	Site:				Notes		
	DG9M DG90 AG90 DG90	8690 Urð8 HrðA	Urða Usða Seða Usða Uðða Uððu	MGDN MGKN	<b>3</b> ВЬЗИ ВЬЧИ ВЬЧЛ <b>3</b> ВЬЗЛ ВЬЗЛ	Bb32 Bb32	Olher ZPLC WPDU BP3Z BP3C
					>		
		Glass			Plastic	-	Misc
10280 40ml	4UmL bisultate clear vial	WGKU	8oz clear soil jar	BP1C	11L NAOH plastic		Wine/Swah
	40mL HCI amber voa vial	WGFU	4oz clear soll jar	BP1N	1L HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
	40mL MEUN CIER VIAL	WGZU	202 clear soil jar	BP1S	1L H2SO4 plastic	ZPLC	Ziploc Bag
	40ml H2SOA ambar vial		402 unpreserved amber wide	BP1U	1L unpreserved plastic	AF	Air Filter
	40ml Na Thio amber vial	AGU	11 UCML UNORES AMDER GLASS	BP1Z	1L NaOH, Zn Acetate	<u>ں</u>	Air Cassettes
	40mL amber Innreserved	VC104	1L HOI amber glass	BP2C	500mL NAOH plastic	2	Terracore Kit
	40mL HCI clear vial	AG1T	11 Na Thiosulfate clearfamhar alaco	DPZN		5	Summa Can
	40mL Na Thio. clear vial	AG1U	11 liter unbres amber class	BP2U	500ml Hzb04 plastic	1	
	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass	BP27	500ml NaOH Zn Acetate		
	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass	BP3C	250mL NaOH plastic	T	Matrix
	1liter unpres glass	AG3S		BP3F	250mL HNO3 plastic - field filtered	WT	IWater
	250mL HCL Clear glass	AG2U		BP3N	250mL HNO3 plastic	SL	Solid
	250mL Unpres Clear glass	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic	NAL	Non-aqueous Liquid
<u>1602</u>	1602 clear soil jar	AG4U	125mL unpres amber glass	BP3S	250mL H2SO4 plastic	OL	
		AG5U	100mL unpres amber glass	BP3Z	250mL NaOH, Zn Acetate	WP	Wipe
				BP4U	125mL unpreserved plastic	DW	Drinking Water
				BP4N	125mL HNO3 plastic	1	
				WPD(1	1607 JUDDASSACTOR DISTIC	Т	
Wark Order Number:						1	23

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Qualtrax Document ID: 30422

Page 1 of 1

# **\\**SI) GOLDER

# MEMORANDUM

Project No. 153140604.0001

DATE June 25, 2022

TO Project File Golder Associates

- **CC** Amanda Derhake, Jeff Ingram
- **FROM** Annie Muehlfarth

EMAIL ann.muehlfarth@wsp.com

# DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – VERIFICATION SAMPLING - DATA PACKAGE 60403844

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

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

# **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Company Name: Golder Associates USA Inc/WSP	Project Manager: <sup>J. Ingram</sup>
Project Name: Ameren - LEC - LCL1	Project Number:
Reviewer: A. Muehlfarth	Validation Date: 7/25/2022
Laboratory: Pace Analytical	SDG #: 60403844
Analytical Method (type and no.): EPA 200.7 (Total Metals	;); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: Air Soil/Sed. Water Wast	
Sample Names L-TMW-2, L-LCL1-DUP-1, L-LCL1-FB-1	

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

a) Sampling dates noted?       Image: Constraint of the second seco		formation	YES	NO	NA	COMMENTS
b) Outsping location noted?       Image: Construction in the constructing and the construction in the construction in the cons	b)	Sampling dates noted?	х			6/22/2022
d) Sample depth indicated (Soils)?	<b>D</b> )	Sampling team indicated?	х			BTT/GTM
e) Sample type indicated (grab/composite)?  i) Field QC noted?  i) Field QC noted?  i) Field Calibration within control limits?  i) Notations of unacceptable field conditions/performances from field logs or field notes?  i) Does the laboratory narrative indicate deficiencies?  i) Does the laboratory narrative indicate 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?  YES NO NA  COMMENTS	c)	Sample location noted?	х			
c)       Outline type introduct (glashoomposite):       Image: See Notes         f)       Field QC noted?       Image: See Notes         g)       Field QC noted?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         h)       Field Calibration within control limits?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         h)       Field Calibration within control limits?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         i)       Notations of unacceptable field conditions/performances from field logs or field notes?         ii)       Does the laboratory narrative indicate deficiencies?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         j)       Does the laboratory narrative indicate deficiencies?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         iii)       Note Deficiencies:       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         iii)       Does the laboratory narrative indicate deficiencies?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         iv)       Does the laboratory narrative indicate deficiencies?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         iii)       Does the laboratory narrative indicate deficiencies?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         iv)       Does the laboratory narrative indicate deficiencies?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         a)       Was the COC properly completed?       Image: PH. Sp.Cond, ORP, Temp, DO, Turb         <	d)	Sample depth indicated (Soils)?			×	
i) Field Quinteer       iiii iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	e)	Sample type indicated (grab/composite)?	х			Grab
a) Was the COC properly completed?   b) Was the COC properly completed?   b) Was the COC properly completed?   c) Were samples received in good condition?   c) Were samples received in good condition?   c) Were Samples received in good condition?	f)	Field QC noted?	х			See Notes
<ul> <li>i) Notations of unacceptable field conditions/performances from field logs or field notes?</li> <li>i) Does the laboratory narrative indicate deficiencies?</li> <li>j) Does the laboratory narrative indicate deficiencies?</li> <li>iii Note Deficiencies:</li> <li>iiii Note Deficiencies:</li> <li>iiiii Note Deficiencies:</li> <li>iiiii Note Deficiencies:</li> <li>iiii Note Deficiencies:</li> <li>iiiii Note Deficiencies:</li> <li>iiiii Note Deficiencies:</li> <li>iiiii Note Deficiencies:</li> <li>iiii Note Deficiencies:</li> <li>iiii Note Deficiencies:</li> <li>iiiii Note Deficiencies:</li> <li>iiiii Note Deficiencies:</li> <li>iiii Note Deficiencies:</li> <li>iii Note Deficiencies:</li> <li></li></ul>	g)	Field parameters collected (note types)?	х			pH, Sp.Cond, ORP, Temp, DO, Turb
j) Does the laboratory narrative indicate deficiencies?       Image: Comparison of the comparison	h)	Field Calibration within control limits?	х			
j) Does the laboratory narrative indicate deficiencies?       Image: Chain-of-Custody (COC)       Image: Chain-of-Custody (COC)         Chain-of-Custody (COC)       YES       NO       NA       COMMENTS         a) Was the COC properly completed?       Image: Chain-of-Custody properly completed?       Image: Custody properly complete	i)	Notations of unacceptable field conditions/performa	nces fro	om field lo	ogs or field r	notes?
Note Deficiencies:				X		
Chain-of-Custody (COC)       YES       NO       NA       COMMENTS         a) Was the COC properly completed?       Image: Comparison of the completed of the co	j)	Does the laboratory narrative indicate deficiencies?			×	
a) Was the COC properly completed?       ∑       □		Note Deficiencies:				
a) Was the COC properly completed?       ∑       □						
a) Was the COC properly completed?       ∑       □						
a) Was the COC properly completed?       ∑       □						
b) Was the COC signed by both field and laboratory personnel?   c) Were samples received in good condition?   X   D	Chain-	of-Custody (COC)	YES	NO	NA	COMMENTS
b) Was the COC signed by both field and laboratory personnel?   c) Were samples received in good condition?   X   D						
and laboratory personnel?  Image: Constraint of the samples received in good condition?    c) Were samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition?    Image: Constraint of the samples received in good condition? <t< td=""><td>a)</td><td>Was the COC properly completed?</td><td>×</td><td></td><td></td><td></td></t<>	a)	Was the COC properly completed?	×			
General (reference QAPP or Method) YES NO NA COMMENTS	,		x			
	,	Was the COC signed by both field			_	
	b)	Was the COC signed by both field and laboratory personnel?	×			
	b)	Was the COC signed by both field and laboratory personnel?	×			
a) Were hold times met for sample pretreatment?	b) c)	Was the COC signed by both field and laboratory personnel? Were samples received in good condition?	×			COMMENTS
	b) c) Genera	Was the COC signed by both field and laboratory personnel? Were samples received in good condition?	≍ ≍ YES			COMMENTS
	b) c) Genera a)	Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Il (reference QAPP or Method) Were hold times met for sample pretreatment?	≍ ≍ YES	П П NO		COMMENTS
	b) c) Genera a) b)	Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Il (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis?	× × YES ×	□ □ □		COMMENTS
	b) c) Genera a) b) c)	Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Il (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used?	× ¥ YES	□ ■ ■ □		COMMENTS
	b) c) Genera a) b) c) d)	Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Il (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used? Was the correct method used?	× × YES × × ×	□ <b>NO</b> □		COMMENTS
g) Were any matrix problems noted?	b) c) Genera a) b) c)	Was the COC signed by both field and laboratory personnel? Were samples received in good condition? Il (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used?	× ¥ YES	□ <b>NO</b> □		

# **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Blanks a) b) c) d)	Were analytes detected in the method blank(s)? Were analytes detected in the field blank(s)? Were analytes detected in the equipment blank(s)? Were analytes detected in the trip blank(s)?	YES ⊠ □	NO	NA	COMMENTS See Notes L-LCL1-FB-1 @ L-TMW-2
Labora	tory 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?	х			
c)	Was the LCS accuracy criteria met?	x			
Duplica	ites	YES	NO	NA	COMMENTS
a)	Were field duplicates collected (note original and du	uplicate	sample na	ames)?	
		х			L-LCL1-DUP-1 @ L-TMW-2
b)	Were field dup. precision criteria met (note RPD)?	х			Max RPD: 10.5% [<20%]
c)	Were lab duplicates analyzed (note original and dup	olicate s	amples)?		
		x			
d)	Were lab dup. precision criteria met (note RPD)?	x			Max RPD: 4% [<10%]
Blind S	tandards	YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,			х	
	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?	x			
	Recovery could not be calculated since sample contained high concentration of analyte?			x	
b)	Was MSD accuracy criteria met?		×		See Notes
	Recovery could not be calculated since sample contained high concentration of analyte?			x	
c)	Were MS/MSD precision criteria met?	×			

#### Comments/Notes:

Sulfate analyzed at a dilution in several samples, no qualification necessary.

#### Blanks:

3167864: Chloride (0.62J). Associated with samples -6010, -6011, -6012. Results >RL and 10x blank were not qualified. Sample -6012 was <RL, analyte reported as ND.

L-LCL1-FB-1 @ L-TMW-2: Chloride (0.63J). Associated result >RL and 10x blank, no qualification necessary.

# **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

#### Comments/Notes:

MS/MSD:

3166169/3166170: MSD % recovery high for calcium. Associated with sample -6010. Only 1 QC indicator outside of control

limits, no qualification necessary.

# **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

# Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-LCL1-FB-1	Chloride	1.0	UJ	Detected in MB, result <rl< th=""></rl<>
	1 44			
	Ann Much	11 16		7/25/2022
Signature:	_ WN/ I MM	1000 -		Date:



November 22, 2022

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

RE: Project: AMEREN LEC LCL1 Pace Project No.: 60413961

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between October 26, 2022 and October 28, 2022. 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,

Parmi Church

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

Enclosures

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





#### CERTIFICATIONS

Project: AMEREN LEC LCL1

Pace Project No.: 60413961

#### **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



#### SAMPLE SUMMARY

Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60413961001	L-TMW-2	Water	10/25/22 10:38	10/26/22 03:51
60413961002	L-TMW-1	Water	10/26/22 16:17	10/28/22 03:43
60413961003	L-TMW-3	Water	10/26/22 13:38	10/28/22 03:43
60413961004	L-LCL1-DUP-1	Water	10/26/22 08:00	10/28/22 03:43
60413961005	L-LCL1-FB-1	Water	10/26/22 16:27	10/28/22 03:43
60413956008	L-MW-26	Water	10/24/22 09:28	10/26/22 03:51
60413956024	L-BMW-1S	Water	10/27/22 10:36	10/28/22 03:43
60413956025	L-BMW-2S	Water	10/27/22 11:35	10/28/22 03:43



#### SAMPLE ANALYTE COUNT

Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60413961001	L-TMW-2	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60413961002	L-TMW-1	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	KJD	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60413961003	L-TMW-3	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	KJD	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
0413961004	L-LCL1-DUP-1	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	KJD	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60413961005	L-LCL1-FB-1	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	KJD	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
60413956008	L-MW-26	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	CRN2, RKA	3	PASI-K
60413956024	L-BMW-1S	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	RKA	3	PASI-K
0413956025	L-BMW-2S	EPA 200.7	JDS	7	PASI-K
		SM 2320B	SZ	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	RKA	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-TMW-2	Lab ID:	60413961001	Collected	l: 10/25/22	2 10:38	Received: 10/	/26/22 03:51 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2	•		nod: EP	A 200.7			
	Pace Anal	vtical Services	- Kansas Ci	ty					
Boron	115	ug/L	100	4.2	1	11/15/22 14:22	11/18/22 19:22	7440-42-8	
Calcium	246000	ug/L	200	33.7	1	11/15/22 14:22	11/18/22 19:22	7440-70-2	M1
Iron	164	ug/L	50.0	5.6	1	11/15/22 14:22	11/18/22 19:22	7439-89-6	
Magnesium	67300	ug/L	50.0	27.1	1	11/15/22 14:22	11/18/22 19:22	7439-95-4	
Manganese	2700	ug/L	5.0	0.24	1	11/15/22 14:22	11/18/22 19:22	7439-96-5	
Potassium	7700	ug/L	500	87.6	1	11/15/22 14:22	11/18/22 19:22	7440-09-7	
Sodium	18000	ug/L	500	73.2	1	11/15/22 14:22	11/18/22 19:22	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
	Pace Anal	vtical Services	- Kansas Ci	ty					
Alkalinity, Total as CaCO3	651	mg/L	20.0	4.6	1		11/02/22 14:42		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
	Pace Anal	vtical Services	- Kansas Ci	ty					
Total Dissolved Solids	1070	mg/L	13.3	13.3	1		11/01/22 14:18		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
	Pace Anal	vtical Services	- Kansas Ci	ty					
Chloride	18.2	mg/L	1.0	0.53	1		11/11/22 09:42	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		11/11/22 09:42	16984-48-8	M1
Sulfate	247	mg/L	100	55.0	100		11/15/22 02:14	14808-79-8	M1



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-TMW-1	Lab ID:	60413961002	Collected	: 10/26/22	2 16:17	Received: 10/	28/22 03:43 M	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2 ytical Services	•		iod: EP/	A 200.7			
Boron Calcium Iron Magnesium Manganese Potassium	115 159000 161 44700 451 5830	ug/L ug/L ug/L ug/L ug/L ug/L	100 200 50.0 50.0 5.0 500	4.2 33.7 5.6 27.1 0.24 87.6	1 1 1 1 1	11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22	11/18/22 19:35 11/18/22 19:35 11/18/22 19:35 11/18/22 19:35 11/18/22 19:35 11/18/22 19:35	7440-70-2 7439-89-6 7439-95-4 7439-96-5 7440-09-7	
Sodium 2320B Alkalinity		ug/L Method: SM 23 ytical Services		73.2 ty	1	11/15/22 14:22	11/18/22 19:35	7440-23-5	
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids	,	mg/L Method: SM 25 ytical Services		4.6 ty	1		11/03/22 19:46		
Total Dissolved Solids 300.0 IC Anions 28 Days		mg/L Method: EPA 3 ytical Services		10.0 ty	1		11/02/22 11:37		
Chloride Fluoride Sulfate	3.2 <0.12 70.8	mg/L mg/L mg/L	1.0 0.20 10.0	0.53 0.12 5.5	1 1 10		11/14/22 22:20 11/14/22 22:20 11/14/22 23:04	16984-48-8	



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-TMW-3	Lab ID:	60413961003	Collected	d: 10/26/22	2 13:38	Received: 10/	/28/22 03:43 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Method: EPA 2 ytical Services	•		nod: EP/	A 200.7			
Boron Calcium Iron Magnesium Manganese Potassium	98.3J 134000 1230 29700 795 5730	ug/L ug/L ug/L ug/L ug/L ug/L	100 200 50.0 50.0 5.0 500	4.2 33.7 5.6 27.1 0.24 87.6	1 1 1 1 1	11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22	11/18/22 19:37 11/18/22 19:37 11/18/22 19:37 11/18/22 19:37 11/18/22 19:37 11/18/22 19:37 11/18/22 19:37	7440-70-2 7439-89-6 7439-95-4 7439-96-5 7440-09-7	
Sodium 2320B Alkalinity		ug/L Method: SM 23 ytical Services		73.2 ity	1	11/15/22 14:22	11/18/22 19:37	7440-23-5	
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids		mg/L Method: SM 25 ytical Services		4.6 ity	1		11/03/22 19:53		
Total Dissolved Solids 300.0 IC Anions 28 Days		mg/L Method: EPA 3 ytical Services		10.0 ity	1		11/02/22 11:37		
Chloride Fluoride Sulfate	3.1 <0.12 39.5	mg/L mg/L mg/L	1.0 0.20 10.0	0.53 0.12 5.5	1 1 10		11/14/22 23:19 11/14/22 23:19 11/14/22 23:33	16887-00-6 16984-48-8 14808-79-8	



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-LCL1-DUP-1	Lab ID:	60413961004	Collected	d: 10/26/22	2 08:00	Received: 10/	/28/22 03:43 Ma	atrix: Water			
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual		
200.7 Metals, Total		Method: EPA 2	•		nod: EP/	A 200.7					
	Pace Anal	ytical Services	- Kansas Ci	ity							
Boron	98.7J	ug/L	100	4.2	1	11/15/22 14:22	11/18/22 19:39	7440-42-8			
Calcium	133000	ug/L	200	33.7	1	11/15/22 14:22	11/18/22 19:39	7440-70-2			
Iron	1280	ug/L	50.0	5.6	1	11/15/22 14:22	11/18/22 19:39	7439-89-6			
Magnesium	29300	ug/L	50.0	27.1	1	11/15/22 14:22	11/18/22 19:39	7439-95-4			
Manganese	793	ug/L	5.0	0.24	1	11/15/22 14:22	11/18/22 19:39	7439-96-5			
Potassium	5760	ug/L	500	87.6	1	11/15/22 14:22	11/18/22 19:39	7440-09-7			
Sodium	6490	ug/L	500	73.2	1	11/15/22 14:22	11/18/22 19:39	7440-23-5			
2320B Alkalinity	Analytical	Method: SM 23	20B								
	Pace Anal	ytical Services	- Kansas Ci	ity							
Alkalinity, Total as CaCO3	427	mg/L	20.0	4.6	1		11/03/22 20:00				
2540C Total Dissolved Solids	Analytical Method: SM 2540C										
	Pace Anal	ytical Services	- Kansas Ci	ity							
Total Dissolved Solids	509	mg/L	10.0	10.0	1		11/02/22 11:37				
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0								
-	Pace Anal	ytical Services	- Kansas Ci	ity							
Chloride	3.2	mg/L	1.0	0.53	1		11/14/22 15:51	16887-00-6	В		
Fluoride	0.13J	mg/L	0.20	0.12	1		11/14/22 15:51	16984-48-8			
Sulfate	38.8	mg/L	5.0	2.8	5		11/14/22 16:06	14808-79-8			



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-LCL1-FB-1	Lab ID:	60413961005	Collected	: 10/26/22	2 16:27	Received: 10/	28/22 03:43 M	atrix: Water			
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual		
200.7 Metals, Total		Method: EPA 2	•		od: EP/	A 200.7					
Boron Calcium Iron	<4.2 52.1J <5.6	ug/L ug/L ug/L	100 200 50.0	4.2 33.7 5.6	1 1 1	11/15/22 14:22 11/15/22 14:22 11/15/22 14:22	11/18/22 19:41 11/18/22 19:41 11/18/22 19:41	7440-70-2 7439-89-6			
Magnesium Manganese Potassium Sodium	<27.1 0.35J 139J <73.2	ug/L ug/L ug/L ug/L	50.0 5.0 500 500	27.1 0.24 87.6 73.2	1 1 1 1	11/15/22 14:22 11/15/22 14:22 11/15/22 14:22 11/15/22 14:22	11/18/22 19:41 11/18/22 19:41 11/18/22 19:41 11/18/22 19:41	7439-96-5 7440-09-7	B B		
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City										
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids		mg/L Method: SM 25 ytical Services		4.6 y	1		11/03/22 20:07				
Total Dissolved Solids 300.0 IC Anions 28 Days	,	mg/L Method: EPA 3 ytical Services		5.0 y	1		11/02/22 11:38				
Chloride Fluoride Sulfate	0.62J <0.12 <0.55	mg/L mg/L mg/L	1.0 0.20 1.0	0.53 0.12 0.55	1 1 1		11/14/22 16:46 11/14/22 16:46 11/14/22 16:46	16984-48-8	В		



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-MW-26	Lab ID:	60413956008	Collecte	d: 10/24/22	2 09:28	Received: 10	/26/22 03:51 Ma	atrix: Water		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Method: EPA 2	•		od: EP	A 200.7				
	Pace Anal	ytical Services	- Kansas C	ity						
Boron	68.3J	ug/L	100	7.6	1	11/15/22 14:08	11/18/22 12:41	7440-42-8		
Calcium	128000	ug/L	200	26.5	1	11/15/22 14:08	11/18/22 12:41	7440-70-2	M1	
Iron	7.5J	ug/L	50.0	7.4	1	11/15/22 14:08	11/18/22 12:41	7439-89-6		
Magnesium	23200	ug/L	50.0	24.1	1	11/15/22 14:08	11/18/22 12:41	7439-95-4		
Manganese	68.9	ug/L	5.0	0.38	1	11/15/22 14:08	11/18/22 12:41	7439-96-5		
Potassium	4180	ug/L	500	90.1	1	11/15/22 14:08	11/18/22 12:41	7440-09-7		
Sodium	5270	ug/L	500	38.8	1	11/15/22 14:08	11/18/22 12:41	7440-23-5		
2320B Alkalinity	Analytical	Method: SM 23	20B							
	Pace Anal	ytical Services	- Kansas C	ity						
Alkalinity, Total as CaCO3	410	mg/L	20.0	4.6	1		11/01/22 18:26			
2540C Total Dissolved Solids	Analytical Method: SM 2540C									
	Pace Anal	ytical Services	- Kansas C	ity						
Total Dissolved Solids	493	mg/L	10.0	10.0	1		10/31/22 14:22			
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0							
-	Pace Anal	ytical Services	- Kansas C	ity						
Chloride	10.3	mg/L	1.0	0.53	1		11/11/22 20:50	16887-00-6	M1	
Fluoride	<0.12	mg/L	0.20	0.12	1		11/11/22 20:50	16984-48-8	M1	
Sulfate	31.3	mg/L	10.0	5.5	10		11/15/22 21:10	14808-79-8		



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-BMW-1S	Lab ID:	60413956024	Collected	d: 10/27/22	2 10:36	Received: 10/	28/22 03:43 Ma	atrix: 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 Calcium Iron Magnesium Manganese Potassium	91.2J 185000 30500 37200 2320 4940	ug/L ug/L ug/L ug/L ug/L ug/L	100 200 50.0 50.0 5.0 500	7.6 26.5 7.4 24.1 0.38 90.1	1 1 1 1 1	11/15/22 14:08 11/15/22 14:08 11/15/22 14:08 11/15/22 14:08 11/15/22 14:08 11/15/22 14:08 11/15/22 14:08	11/18/22 13:27 11/18/22 13:27 11/21/22 11:17 11/18/22 13:27 11/18/22 13:27 11/18/22 13:27	7440-70-2 7439-89-6 7439-95-4 7439-96-5 7440-09-7			
Sodium 2320B Alkalinity	<b>15500</b> ug/L 500 38.8 1 11/15/22 14:08 11/18/22 13:27 7440-23-5 Analytical Method: SM 2320B Pace Analytical Services - Kansas City										
Alkalinity, Total as CaCO3 2540C Total Dissolved Solids	,	mg/L Method: SM 25 ytical Services		4.6 ity	1		11/03/22 16:57				
Total Dissolved Solids 300.0 IC Anions 28 Days	710         mg/L         10.0         10.0         1         11/03/22         15:40           Analytical Method: EPA 300.0         Pace Analytical Services - Kansas City         Figure 10.0         Figure										
Chloride Fluoride Sulfate	5.9 <0.12 66.5	mg/L mg/L mg/L	1.0 0.20 5.0	0.53 0.12 2.8	1 1 5		11/14/22 13:44 11/14/22 13:44 11/14/22 13:59	16984-48-8			



#### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

Sample: L-BMW-2S	Lab ID:	60413956025	Collecte	d: 10/27/22	2 11:35	Received: 10/	/28/22 03:43 M	atrix: Water		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Method: EPA 2	•		nod: EP	A 200.7				
		ytical Services		,						
Boron	45.3J	ug/L	100	7.6	1	11/15/22 14:08	11/18/22 13:47			
Calcium	146000	ug/L	200	26.5	1	11/15/22 14:08	11/18/22 13:47			
Iron	16.0J	ug/L	50.0	7.4	1	11/15/22 14:08	11/21/22 11:35			
Magnesium	21300	ug/L	50.0	24.1	1	11/15/22 14:08	11/18/22 13:47			
Manganese	4.9J	ug/L	5.0	0.38	1	11/15/22 14:08	11/18/22 13:47			
Potassium	5400	ug/L	500	90.1	1	11/15/22 14:08	11/18/22 13:47			
Sodium	4130	ug/L	500	38.8	1	11/15/22 14:08	11/18/22 13:47	7440-23-5		
2320B Alkalinity	Analytical	Method: SM 23	320B							
	Pace Anal	ytical Services	- Kansas C	ity						
Alkalinity, Total as CaCO3	404	mg/L	20.0	4.6	1		11/03/22 17:04			
2540C Total Dissolved Solids	Analytical Method: SM 2540C									
	Pace Anal	ytical Services	- Kansas C	ity						
Total Dissolved Solids	496	mg/L	10.0	10.0	1		11/03/22 15:40			
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0							
	Pace Anal	ytical Services	- Kansas C	ity						
Chloride	1.4	mg/L	1.0	0.53	1		11/14/22 14:47	16887-00-6		
Fluoride	<0.12	mg/L	0.20	0.12	1		11/14/22 14:47	16984-48-8		
Sulfate	34.4	mg/L	5.0	2.8	5		11/14/22 15:01	14808-79-8		



Project: AMEREN LEC LCL1

Pace Project No.:	60413961
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QC Batch:	818348		Analysis Met	hod:	EPA 200.7				
QC Batch Method:	EPA 200.7		Analysis Des	cription:	200.7 Metals, Total				
			Laboratory:		Pace Analytical Se	rvices - Kansas City	/		
Associated Lab Sar	mples: 60413956	6008, 60413956024							
METHOD BLANK:	3254663		Matrix:	Water					
Associated Lab Sar	mples: 60413956	008, 60413956024							
			Blank	Reporting					
Parar	neter	Units	Result	Limit	MDL	Analyzed	Qualifiers		
Boron		ug/L	<7.6	10	7.6	11/18/22 12:19			
Calcium		ug/L	57.2J	20	0 26.5	11/18/22 12:19			
Iron		ug/L	<7.4	50	.0 7.4	11/18/22 12:19			
Magnesium		ug/L	<24.1	50	.0 24.1	11/18/22 12:19			
Manganese		ug/L	0.71J	5	.0 0.38	11/18/22 12:19			
Potassium		ug/L	<90.1	50	90.1	11/18/22 12:19			
Sodium		ug/L	<38.8	50	0 38.8	11/21/22 11:09			

#### LABORATORY CONTROL SAMPLE: 3254664

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L		960	96	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Iron	ug/L	10000	10000	100	85-115	
Magnesium	ug/L	10000	10000	100	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	9940	99	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SP		LICATE: 3254			3254666							
Parameter	Units	60413956008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qua
Boron	ug/L		1000	1000	1010	990	94		70-130	2		
Calcium	ug/L	128000	10000	10000	141000	139000	132	-	70-130	1	-	M1
Iron	ug/L	7.5J	10000	10000	9930	9660	99	97	70-130	3	20	
Magnesium	ug/L	23200	10000	10000	33300	33000	101	98	70-130	1	20	
Manganese	ug/L	68.9	1000	1000	1040	1020	97	95	70-130	2	20	
Potassium	ug/L	4180	10000	10000	14300	13900	101	97	70-130	3	20	
Sodium	ug/L	5270	10000	10000	15500	15200	102	99	70-130	2	20	
MATRIX SPIKE SAMPLE:		3254667										
			60413	956016	Spike	MS		MS	% Rec			
Parameter		Units	Re	sult	Conc.	Result	9	% Rec	Limits		Quali	fiers
Boron		ug/L		316	1000	12	240	92	70·	-130		
Calcium		ug/L		166000	10000	1780	000	120	70·	-130		

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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Project: AMEREN LEC LCL1

Pace Project No.: 60413961

MATRIX SPIKE SAMPLE:	3254667	60413956016	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	% Rec Limits	Qualifiers
Iron	ug/L	14200	10000	24400	102	70-130	
Magnesium	ug/L	33700	10000	43500	98	70-130	
Manganese	ug/L	2780	1000	3680	90	70-130	
Potassium	ug/L	6180	10000	16000	98	70-130	
Sodium	ug/L	50300	10000	60800	105	70-130	

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.



Project: AMEREN LEC LCL1

Pace Project No.: 60413961

QC Batch: 81	8353	Analysis Method:	EPA 200.7
QC Batch Method: EP	PA 200.7	Analysis Description:	200.7 Metals, Total
		Laboratory:	Pace Analytical Services - Kansas City
Associated Lab Samples	: 60413956025		
METHOD BLANK: 3254	4702	Matrix: Water	

Associated Lab Samples: 60413956025

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<7.6	100	7.6	11/18/22 13:30	
Calcium	ug/L	<26.5	200	26.5	11/18/22 13:30	
Iron	ug/L	19.1J	50.0	7.4	11/21/22 11:19	
Magnesium	ug/L	<24.1	50.0	24.1	11/18/22 13:30	
Manganese	ug/L	0.76J	5.0	0.38	11/18/22 13:30	
Potassium	ug/L	<90.1	500	90.1	11/18/22 13:30	
Sodium	ug/L	<38.8	500	38.8	11/18/22 13:30	

### LABORATORY CONTROL SAMPLE: 3254703

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	896	90	85-115	
Calcium	ug/L	10000	9510	95	85-115	
Iron	ug/L	10000	9980	100	85-115	
Magnesium	ug/L	10000	9300	93	85-115	
Manganese	ug/L	1000	940	94	85-115	
Potassium	ug/L	10000	9370	94	85-115	
Sodium	ug/L	10000	9530	95	85-115	

MATRIX SPIKE & MATRIX SF		_ICATE: 3254	704		3254705							
		60413956017	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Boron	ug/L	8070	1000	1000	9180	9250	111	117	70-130	1	20	
Calcium	ug/L	97400	10000	10000	109000	110000	117	123	70-130	1	20	
Iron	ug/L	4830	10000	10000	14900	14800	101	99	70-130	1	20	
Magnesium	ug/L	11900	10000	10000	21200	21300	93	94	70-130	0	20	
Manganese	ug/L	248	1000	1000	1170	1200	92	95	70-130	3	20	
Potassium	ug/L	8950	10000	10000	18900	19200	100	103	70-130	2	20	
Sodium	ug/L	104000	10000	10000	115000	115000	109	113	70-130	0	20	
MATRIX SPIKE SAMPLE:		3254706										
			60413	956026	Spike	MS		MS	% Rec			
Parameter		Units	Re	esult	Conc.	Result	%	Rec	Limits		Qualif	iers
Boron		ug/L		9220	1000	77	710	-151	70	-130 N	11	
Calcium		ug/L		108000	10000	848	300	-232	70	-130 N	11	

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### **REPORT OF LABORATORY ANALYSIS**



Project: AMEREN LEC LCL1

Pace Project No.: 60413961

MATRIX SPIKE SAMPLE:	3254706						
		60413956026	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Iron	ug/L	5240	10000	10400	51	70-130	M1
Magnesium	ug/L	22000	10000	9740	-122	70-130	M1
Manganese	ug/L	275	1000	995	72	70-130	
Potassium	ug/L	7390	10000	22600	152	70-130	M1
Sodium	ug/L	99400	10000	89100	-103	70-130	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.



QC Batch:	818362		Analysis Methe	od: EPA	200.7		
QC Batch Method	I: EPA 200.7		Analysis Desc	ription: 200.	7 Metals, Total		
			Laboratory:	Pace	e Analytical Sei	rvices - Kansas City	1
Associated Lab Sa	amples: 604139610	01, 60413961002	2, 60413961003, 60	413961004, 604 <sup>,</sup>	13961005		
METHOD BLANK	: 3254745		Matrix: V	Vater			
Associated Lab Sa	amples: 604139610	01, 60413961002	2, 60413961003, 60	413961004, 604 <sup>.</sup>	13961005		
			Blank	Reporting			
			Diam	rtoporting			
Para	ameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Para	ameter	Units ug/L			MDL 4.2	Analyzed 11/18/22 19:18	Qualifiers
	ameter		Result	Limit			Qualifiers
Boron	ameter	ug/L	Result	Limit	4.2	11/18/22 19:18	Qualifiers
Boron Calcium	ameter	ug/L ug/L	Result <4.2 <33.7	Limit	4.2 33.7	11/18/22 19:18 11/18/22 19:18	Qualifiers
Boron Calcium Iron	ameter	ug/L ug/L ug/L	Result <4.2 <33.7 <5.6	Limit 100 200 50.0	4.2 33.7 5.6	11/18/22 19:18 11/18/22 19:18 11/18/22 19:18	Qualifiers
Boron Calcium Iron Magnesium	ameter _	ug/L ug/L ug/L ug/L	Result <4.2 <33.7 <5.6 <27.1	Limit 100 200 50.0 50.0	4.2 33.7 5.6 27.1	11/18/22 19:18 11/18/22 19:18 11/18/22 19:18 11/18/22 19:18	Qualifiers

_		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	1000	875	88	85-115	
Calcium	ug/L	10000	9730	97	85-115	
Iron	ug/L	10000	9430	94	85-115	
Magnesium	ug/L	10000	10000	100	85-115	
Manganese	ug/L	1000	931	93	85-115	
Potassium	ug/L	10000	9360	94	85-115	
Sodium	ug/L	10000	10000	100	85-115	

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	CATE: 3254	747		3254748							
Parameter	6 Units	0413961001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	115	1000	1000	1020	1000	90	89	70-130	1	20	
Calcium	ug/L	246000	10000	10000	250000	250000	39	38	70-130	0	20	M1
Iron	ug/L	164	10000	10000	9710	9480	95	93	70-130	2	20	
Magnesium	ug/L	67300	10000	10000	75900	75900	86	86	70-130	0	20	
Manganese	ug/L	2700	1000	1000	3600	3570	90	87	70-130	1	20	
Potassium	ug/L	7700	10000	10000	17400	17300	97	96	70-130	0	20	
Sodium	ug/L	18000	10000	10000	27300	27100	93	91	70-130	1	20	

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### **REPORT OF LABORATORY ANALYSIS**



Project: AMEREN LEC LCI Pace Project No.: 60413961	L1						
QC Batch: 815835		Analysis Me	thod: S	SM 2320B			
QC Batch Method: SM 2320B		Analysis Des		320B Alkalin	itv		
		Laboratory:			al Services - Ka	insas C	ity
Associated Lab Samples: 604139560	800	,		,			
METHOD BLANK: 3244507		Matrix	Water				
Associated Lab Samples: 604139560	800						
_		Blank	Reporting				
Parameter	Units	Result	Limit	MDL	Analy		Qualifiers
Alkalinity, Total as CaCO3	mg/L	4.8J	20.0	)	4.6 11/01/22	2 16:22	
LABORATORY CONTROL SAMPLE:	3244508						
-		Spike	LCS	LCS	% Rec	•	
Parameter	Units		Result	% Rec	Limits		alifiers
Alkalinity, Total as CaCO3	mg/L	500	485	97	90-110		
SAMPLE DUPLICATE: 3244509							
		60414091002	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	639	641	1	0	10	
SAMPLE DUPLICATE: 3244510							
		60413956004	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	273	274	1	0	10	
SAMPLE DUPLICATE: 3244511							
		60413956008	Dup		Max		
Parameter	Units		Result	RPD	RPD		Qualifiers

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### **REPORT OF LABORATORY ANALYSIS**



Project: AMEREN LEC L Pace Project No.: 60413961	.CL1						
QC Batch: 816118 QC Batch Method: SM 2320B		Analysis	Method: Description:	SM 2320B 2320B Alkalin			
		Laborator			al Services - Ka	ansas (	Sitv
Associated Lab Samples: 6041396	61001	Laborator	y.				Jity
METHOD BLANK: 3245823		Mat	rix: Water				
Associated Lab Samples: 6041396	51001						
Parameter	Units	Blank Result	Reporting Limit	MDL	Analy	zed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4	1.6 2	0.0	4.6 11/02/22	2 14:01	
LABORATORY CONTROL SAMPLE:	3245824						
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qu	alifiers
Alkalinity, Total as CaCO3	mg/L	500	482	96	90-110		
SAMPLE DUPLICATE: 3245825							
		6041395900			Max		
Parameter	Units	Result		RPD			Qualifiers
Alkalinity, Total as CaCO3	mg/L	00	5.0 6	3.3	5	10	
SAMPLE DUPLICATE: 3245826		6041396000	)1 Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	3.	26 3	327	0	10	
SAMPLE DUPLICATE: 3245827							
Parameter	Units	6041396100 Result	)1 Dup Result	RPD	Max RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	6	51 6		1	10	
SAMPLE DUPLICATE: 3245828							
Parameter	Units	6041410400 Result	)2 Dup Result	RPD	Max RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	5	08 5	505	1	10	
SAMPLE DUPLICATE: 3245829							
Parameter	Units	6041410400 Result	)4 Dup Result	RPD	Max RPD		Qualifiers

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**



Project:	AMEREN LEC LO	CL1						
Pace Project No.:	60413961							
QC Batch:	816349		Analysis Me	ethod:	SM 2320B			
QC Batch Method:	SM 2320B		Analysis De	escription:	2320B Alkalin	ity		
			Laboratory:	I	Pace Analytic	al Services - Kar	nsas Cit	y
Associated Lab San	nples: 6041396	1002, 6041396100	03, 60413961004,	60413961005				
METHOD BLANK:	3246752		Matrix	: Water				
Associated Lab San	nples: 6041396	1002, 6041396100	3, 60413961004,	60413961005				
			Blank	Reporting				
Paran	neter	Units	Result	Limit	MDL	Analyz	ed	Qualifiers
Alkalinity, Total as C	aCO3	mg/L		20.	0	4.6 11/03/22	17:58	
LABORATORY CON	NTROL SAMPLE:	3246753						
			Spike	LCS	LCS	% Rec		
Paran	neter	Units	Conc.	Result	% Rec	Limits	Qual	lifiers
Alkalinity, Total as C	aCO3	mg/L	500	482	96	90-110		
SAMPLE DUPLICA	TE: 3246754							
			60413956013	Dup		Max		
Paran	neter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as C	aCO3	mg/L	6.6J	<4.	6		10	
SAMPLE DUPLICA	TE: 3246755							
			60413956017	Dup		Max		
Paran	neter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as C	aCO3	mg/L	147	14	3	3	10	
SAMPLE DUPLICA	TE: 3246756							
			60413959012	Dup		Max		
Paran	neter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as C	aCO3	mg/L	<4.6	<4.	6		10	

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### **REPORT OF LABORATORY ANALYSIS**



Project: AM	IEREN LEC LCL1							
Pace Project No.: 604	113961							
QC Batch: 8	16350		Analysis Me	ethod:	SM 2320B			
QC Batch Method: S	M 2320B		Analysis De	escription:	2320B Alkalin	nity		
			Laboratory:		Pace Analytic	al Services - Ka	ansas Ci	ity
Associated Lab Sample	s: 6041395602	4, 60413956025						
METHOD BLANK: 324	46761		Matrix	: Water				
Associated Lab Sample	s: 6041395602	4, 60413956025						
			Blank	Reporting				
Paramete	r	Units	Result	Limit	MDL	Analy	zed	Qualifiers
Alkalinity, Total as CaCC	)3	mg/L	<4.6	6 20	0.0	4.6 11/03/22	2 15:09	
LABORATORY CONTR	OL SAMPLE: 3	246762				04 <b>D</b>		
Paramete	-	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	0	alifiers
Alkalinity, Total as CaCC	03	mg/L	500	482	96	90-110		
SAMPLE DUPLICATE:	3246763							
			60414155002	Dup		Max		
Paramete	r	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as CaCC	)3	mg/L	81.3	3 77	<u>′.4</u>	5	10	
SAMPLE DUPLICATE:	3246764							
			60414190001	Dup		Max		0 11
Paramete		Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as CaCC	03	mg/L	297	2	99	1	10	
SAMPLE DUPLICATE:	3246765							
			60413959007	Dup		Max		
Paramete	r	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as CaCC		mg/L	158	3 1:	52	4	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**



Project: AMER	REN LEC LCL1									
Pace Project No.: 60413	3961									
QC Batch: 815	561		Analysis M	lethod:	SM 254	40C				
QC Batch Method: SM	2540C		Analysis D	escription:	2540C	Total D	issolv	ved Solids		
			Laboratory	/:	Pace A	nalytica	al Sei	vices - Kar	isas Ci	ty
Associated Lab Samples:	60413956008									
METHOD BLANK: 32436	642		Matri	ix: Water						
Associated Lab Samples:	60413956008									
			Blank	Reportin	g					
Parameter		Units	Result	Limit		MDL		Analyz	ed	Qualifiers
Total Dissolved Solids		mg/L	<5.	0	5.0		5.0	10/31/22	14:20	
LABORATORY CONTROL	SAMPLE: 3243	643								
_			Spike	LCS	LCS			6 Rec	_	
Parameter		Units	Conc.	Result	% Re	ec		imits	Qua	lifiers
Total Dissolved Solids		mg/L	1000	1020		102		80-120		
SAMPLE DUPLICATE: 3	243645									
			60413956008					Max		0 11
Parameter		Units	Result	Result		RPD		RPD		Qualifiers
Total Dissolved Solids		mg/L	49	3	489		1		10	
SAMPLE DUPLICATE: 3	244133									
Dama		11-26-	60413768001					Max		0
Parameter		Units	Result	Result		RPD		RPD		Qualifiers
Total Dissolved Solids		mg/L	72	0	735		2		10	

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



Project: AMEREN LEC L	CL1						
Pace Project No.: 60413961							
QC Batch: 815775		Analysis M	ethod:	SM 2540C			
QC Batch Method: SM 2540C		Analysis D	escription:	2540C Total E	Dissolved	Solids	
		Laboratory	:	Pace Analytic	al Service	es - Kansas C	Sity
Associated Lab Samples: 6041396	51001						
METHOD BLANK: 3244259		Matri	x: Water				
Associated Lab Samples: 6041396	51001						
		Blank	Reporting				
Parameter	Units	Result	Limit	MDL		Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	) :	5.0	5.0 11	/01/22 14:13	
LABORATORY CONTROL SAMPLE:	3244260						
_		Spike	LCS	LCS	% Re		
Parameter	Units	Conc.	Result	% Rec	Limit	s Qu	alifiers
Total Dissolved Solids	mg/L	1000	1010	101	8	0-120	
SAMPLE DUPLICATE: 3244261							
Devenuelar	11-26-	60413960001				Max	
Parameter	Units	Result	Result	RPD		RPD	Qualifiers
Total Dissolved Solids	mg/L	700	) 7	07	1	10	
SAMPLE DUPLICATE: 3244262							
Devenueter	l la ita	60413961001	Dup	000		Max	Qualifiana
Parameter	Units	Result	Result	RPD		RPD	Qualifiers
Total Dissolved Solids	mg/L	1070	) 10	80	1	10	

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



Project:	AMEREN LEC LC	L1						
Pace Project No.:	60413961							
QC Batch:	815993		Analysis Me	ethod:	SM 2540C			
QC Batch Method:	SM 2540C		Analysis De	escription:	2540C Total D	issolved Solids		
			Laboratory:		Pace Analytica	al Services - Kai	nsas Cit	у
Associated Lab Samp	oles: 60413961	002, 6041396100	03, 60413961004,	60413961005	-			
METHOD BLANK: 3	3245280		Matrix	: Water				
Associated Lab Samp	oles: 60413961	002, 6041396100	03, 60413961004,	60413961005				
			Blank	Reporting				
Parame	eter	Units	Result	Limit	MDL	Analyz	zed	Qualifiers
Total Dissolved Solids	 6	mg/L		5	.0	5.0 11/02/22	11:26	
		-						
LABORATORY CON	TROL SAMPLE:	3245281						
			Spike	LCS	LCS	% Rec		
Parame	eter	Units	Conc.	Result	% Rec	Limits	Qual	ifiers
Total Dissolved Solids	3	mg/L	1000	1010	101	80-120		
SAMPLE DUPLICATI	E: 3245282							
			60413956020	Dup		Max		
Parame	eter	Units	Result	Result	RPD	RPD		Qualifiers
Total Dissolved Solids	6	mg/L	5.0	) <5	.0		10	
SAMPLE DUPLICATI	E: 3245283							
			60413960003	Dup		Max		
Parame	eter	Units	Result	Result	RPD	RPD		Qualifiers
Total Dissolved Solids	6	mg/L	511	56	61	9	10	

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



Project:	AMEREN LEC LC	L1							
Pace Project No.:	60413961								
QC Batch:	816279		Analysis M	ethod:	SM 2540C				
QC Batch Method:	SM 2540C		Analysis De	escription:	2540C Total [	Dissolv	ed Solids		
			Laboratory	:	Pace Analytic	al Ser	/ices - Kar	nsas Ci	ity
Associated Lab Sar	mples: 60413956	6024, 60413956025							
METHOD BLANK:	3246425		Matrix	x: Water					
Associated Lab Sar	mples: 60413956	6024, 60413956025							
			Blank	Reporting					
Parar	neter	Units	Result	Limit	MDL		Analyz	ed	Qualifiers
Total Dissolved Soli	ds	mg/L	<5.0	)	5.0	5.0	11/03/22	15:39	
LABORATORY CO	NTROL SAMPLE:	3246426							
			Spike	LCS	LCS		Rec		
Parar	neter	Units	Conc.	Result	% Rec	Li	mits	Qua	lifiers
Total Dissolved Soli	ds	mg/L	1000	1000	100		80-120		
SAMPLE DUPLICA	TE: 3246427								
_			60414192001	Dup			Max		
Parar	neter	Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Soli	ds	mg/L	3930	) 40	)30	3		10	
SAMPLE DUPLICA	TE: 3246428								
_			60413959007		_		Max		
Parar	neter	Units	Result	Result	RPD		RPD		Qualifiers
Total Dissolved Soli	ds	mg/L	762	2 7	794	4		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.



QC Batch: 8177	71		Analys	sis Met	hod:	EPA 300.0	)					
QC Batch Method: EPA	300.0		-		cription:	300.0 IC A	Anions					
			Labor		·	Pace Ana	vtical Se	rvices - Kar	nsas City			
Associated Lab Samples:	604139560	08		,					,			
METHOD BLANK: 32522	61		I	Matrix:	Water							
Associated Lab Samples:	604139560	08										
_			Blan		Reporting							
Parameter		Units	Resu	lt	Limit	M	DL	Analyz	.ed	Qualifie	rs	
Chloride		mg/L		0.59J		.0	0.53	11/11/22				
Fluoride		mg/L		<0.12	0.		0.12	11/11/22				
Sulfate		mg/L		<0.55	1	.0	0.55	11/11/22	17:54			
METHOD BLANK: 32557	49			Matrix:	Water							
Associated Lab Samples:	604139560	08										
			Blan	<b>(</b>	Reporting							
Parameter		Units	Resu	lt	Limit	M	DL	Analyz	ed	Qualifie	rs	
Chloride		mg/L		<0.53	1	.0	0.53	11/15/22	09:48			
Fluoride		mg/L		<0.12	0.	20	0.12	11/15/22	09:48			
Sulfate		mg/L		<0.55	1	.0	0.55	11/15/22	09:48			
LABORATORY CONTROL	SAMPLE: 3	3252262										
			Spike		LCS	LCS	c	% Rec				
Parameter		Units	Conc.		Result	% Rec		Limits	Qualifie	ers		
			Conc.	F	Result	% Rec			Qualifie	ers		
Chloride		mg/L	Conc.	F 	Result 4.8	% Rec	97	90-110	Qualifie	ers		
			Conc.	F 	Result	% Rec			Qualifie	ers		
Chloride Fluoride Sulfate	SAMPI F: :	mg/L mg/L mg/L	Conc.	F 	8esult 4.8 2.4	% Rec	97 97 97	90-110 90-110	Qualifie	ers		
Chloride Fluoride Sulfate	SAMPLE: 3	mg/L mg/L	Conc.	F 5 5	8esult 4.8 2.4	% Rec	97 97 94	90-110 90-110	Qualifie	ers		
Chloride Fluoride Sulfate	SAMPLE: 3	mg/L mg/L mg/L	Conc.	F	Result 4.8 2.4 4.7	% Rec	97 97 94	90-110 90-110 90-110	Qualifie			
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter	SAMPLE: 3	mg/L mg/L mg/L 3255750 Units	Conc.	F 5 5 7 7 7	Result 4.8 2.4 4.7 LCS	% Rec LCS % Rec	97 97 94	90-110 90-110 90-110 % Rec				
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride	SAMPLE: 3	mg/L mg/L mg/L 3255750	Conc.	F 5 5 5 5	Aesult 4.8 2.4 4.7 LCS Result	% Rec LCS % Rec	97 97 94	90-110 90-110 90-110 % Rec Limits				
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride	SAMPLE: :	mg/L mg/L 3255750 Units mg/L	Spike Conc.	F	Result         4.8           2.4         4.7           LCS         Result           4.6         4.6	% Rec LCS % Rec	97 97 94 94 93	90-110 90-110 90-110 % Rec Limits 90-110				
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate		mg/L mg/L 3255750 Units mg/L mg/L mg/L	Conc.	F	Result         4.8           2.4         4.7           LCS         4.6           2.6         2.6	% Rec LCS % Rec	97 97 94 93 93 06	90-110 90-110 90-110 % Rec Limits 90-110 90-110				
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate		mg/L mg/L 3255750 Units mg/L mg/L mg/L	Conc.	F	Result     4.8       2.4     4.7       4.7     4.7	% Rec LCS % Rec	97 97 94 93 93 06	90-110 90-110 90-110 % Rec Limits 90-110 90-110				
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX	SPIKE DUPL	mg/L mg/L 3255750 Units mg/L mg/L mg/L	Conc.	F 5 5 5 5 5	Result     4.8       2.4     4.7       4.7     4.7	% Rec LCS % Rec 1 4 MSD	97 97 94 93 06 99 MS	90-110 90-110 90-110 % Rec Limits 90-110 90-110 90-110 90-110	Qualifie	ers ec	Max	
Chloride Fluoride Sulfate ABORATORY CONTROL Parameter Chloride Fluoride Sulfate	SPIKE DUPL	mg/L mg/L 3255750 Units mg/L mg/L mg/L mg/L	Conc. 2.5 5 Spike Conc. 2.5 5 263 MS	F F MSD	Result         4.8           2.4         4.7           LCS         4.6           2.6         5.0           325226         325226	% Rec LCS % Rec 1	97 97 94 93 93 06 99	90-110 90-110 90-110 % Rec Limits 90-110 90-110 90-110 90-110	Qualifie	ers ec		
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX Parameter Chloride	SPIKE DUPL	mg/L mg/L 3255750 Units mg/L mg/L mg/L .ICATE: 32522 60413956008	Conc. 2.5 5 Spike Conc. 263 MS Spike Conc. 5	MSD Spike Conc.	Result         4.8           2.4         4.7           LCS         4.6           2.6         5.0           325226         MS           Result         5	% Rec LCS % Rec 1 4 MSD Result 5 16.3	97 97 94 93 06 99 99 MS - % Re	90-110 90-110 90-110 % Rec Limits 90-110 90-110 90-110 90-110 90-110	Qualifie 0 % Re c Limit 21 80-1	ec is RPD	$\frac{1}{1} \frac{\text{RPE}}{1}$	0 Qua 5 M1
Chloride Fluoride Sulfate LABORATORY CONTROL Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRIX	SPIKE DUPL	mg/L mg/L mg/L 3255750 Units mg/L mg/L mg/L .ICATE: 32522 60413956008 Result	Conc. Spike Conc. 2.5 5 2.5 5 263 MS Spike Conc.	F F MSD Spike Conc. 2	Result         4.8           2.4         4.7           LCS         4.6           2.6         5.0           325226         MS           Result         1	% Rec LCS % Rec 4 MSD Result 5 16.3	97 97 94 93 06 99 99 MS - % Re	90-110 90-110 90-110 % Rec Limits 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifie	ec is RPD 120	$\frac{1}{1} \frac{\text{RPE}}{1}$	0 Qua 5 M1 5 M1

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### **REPORT OF LABORATORY ANALYSIS**



Project: AMEREN LEC LCL1

Pace Project No.: 60413961

MATRIX SPIKE & MATRIX SP		CATE: 3252	266		3252267							
			MS	MSD								
	6	60413960001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	20.8	25	25	46.5	46.1	103	101	80-120	1	15	
Fluoride	mg/L	0.33	2.5	2.5	3.4	3.4	124	125	80-120	0	15	M1
Sulfate	mg/L	198	100	100	307	305	109	107	80-120	1	15	

### SAMPLE DUPLICATE: 3252265

Parameter	Units	60413956008 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	10.3	10.4	1	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	31.3	30.3	3	15	

### SAMPLE DUPLICATE: 3252268

		60413960001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	20.8	21.4	3	15	
Fluoride	mg/L	0.33	0.33	0	15	
Sulfate	mg/L	198	188	5	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.



QC Batch: 817772		Analysis Me	ethod:	EPA 300.	.0			
QC Batch Method: EPA 300.0		Analysis De	escription:	300.0 IC	Anions			
		Laboratory:		Pace Ana	alytical Se	rvices - Kan	sas City	
Associated Lab Samples: 60413961	001	,			,			
IETHOD BLANK: 3252269		Matrix	: Water					
Associated Lab Samples: 60413961	001							
		Blank	Reporting	1				
Parameter	Units	Result	Limit		/IDL	Analyze	ed	Qualifiers
Chloride	mg/L	<0.53		1.0	0.53	11/11/22 0		
Fluoride	mg/L	<0.12		.20	0.12	11/11/22 0		
Sulfate	mg/L	< 0.55		1.0	0.55	11/11/22 0		
	5			-				
IETHOD BLANK: 3254909		Matrix	: Water					
Associated Lab Samples: 60413961	001							
		Blank	Reporting	1				
Parameter	Units	Result	Limit		/IDL	Analyze	ed	Qualifiers
Chloride	mg/L			1.0	0.53	11/14/22 0	)8:48	
Fluoride	mg/L	<0.12		.20	0.12	11/14/22 0		
Sulfate	mg/L	<0.55		1.0	0.55	11/14/22 0		
IETHOD BLANK: 3255739		Matrix	: Water					
ssociated Lab Samples: 60413961	001							
_		Blank	Reporting					
Parameter	Units	Result	Limit	N	/IDL	Analyze	ed	Qualifiers
Chloride	mg/L	0.57J	I	1.0	0.53	11/15/22 0	)8:24	
Fluoride	mg/L	<0.12	2 0	.20	0.12	11/15/22 0	)8:24	
Sulfate	mg/L	<0.55	5	1.0	0.55	11/15/22 0	)8:24	
IETHOD BLANK: 3256514		Matrix	: Water					
	004	Math	. Water					
Associated Lab Samples: 60413961	001	Disala	Demention					
Parameter	Units	Blank Result	Reporting Limit	•	/IDL	Analyze	əd	Qualifiers
Chloride	mg/L	0.60J	 	1.0	0.53	11/16/22 0	08:40	
luoride	mg/L	<0.12		.20	0.12	11/16/22 0		
Sulfate	mg/L	<0.55		1.0	0.55	11/16/22 0		
	Ŭ							
ABORATORY CONTROL SAMPLE:	3252270	Calles		1.00				
Parameter	Units	Spike Conc.	LCS Rosult	LCS % Rec		6 Rec ∟imits	Qualifie	
	-		Result	70 REC			Qualifie	
Chloride	mg/L	5	4.8		95	90-110		
Fluoride	mg/L	2.5	2.6		104	90-110		

### **REPORT OF LABORATORY ANALYSIS**



### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

LABORATORY CONTROL SA	MPLE: 3	3252270										
Deveneter		l la ita	Spike	LC		LCS	% Re		Qualifiers			
Parameter		Units	Conc.	Res	·	% Rec	Limit		Juaimers	_		
Sulfate		mg/L		5	4.7	9;	3 9	90-110				
LABORATORY CONTROL SA	MPLE: 3	3254910										
Parameter		Units	Spike Conc.	LC Res		LCS % Rec	% Re Limit		Qualifiers			
Chloride		mg/L		5	4.8	9	5 9	90-110		_		
Fluoride		mg/L	2	.5	2.5	100	0 9	90-110				
Sulfate		mg/L		5	4.9	9	7 9	90-110				
LABORATORY CONTROL SA	MPLE: 3	3255740										
			Spike	LC		LCS	% Re					
Parameter		Units	Conc.	Res	ult	% Rec	Limit	ts (	Qualifiers	_		
Chloride		mg/L		5	4.9	98	89	90-110				
Fluoride		mg/L	2	.5	2.6	103	3 9	90-110				
Sulfate		mg/L		5	4.9	9	7 9	90-110				
LABORATORY CONTROL SA	MPLE: 3	3256515										
			Spike	LC	S	LCS	% Re					
Parameter		Units	Conc.	Res	ult	% Rec	Limi	ts (	Qualifiers	_		
Chloride		mg/L		5	4.8	96	6 9	90-110				
Fluoride		mg/L	2	.5	2.6	104	4 9	90-110				
Sulfate		mg/L		5	4.8	90	6 9	90-110				
MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 3252	272		3252273							
			MS	MSD								
		60413961001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	18.2	5	5	23.5	23.8	107	113		1		
Fluoride	mg/L	<0.12	2.5	2.5	1.9	2.0	76	80		6		
Sulfate	mg/L	247	500	500	1240	1240	199	199	80-120	0	15	M1
MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 3252			3252275							
			MS	MSD								
Parameter	Units	60415008021	Spike	Spike	MS	MSD Decult	MS % Dee	MSD	% Rec	חחח	Max	0!
	211011	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	686	500	500	1210	1220	105	106		0		
Chloride Fluoride Sulfate		686 ND 109	500 25 50	500 25 50	1210 24.4 179	1220 23.9 171	105 98 138	106 96 124	80-120	0 2 4	15	

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

### **REPORT OF LABORATORY ANALYSIS**



### Project: AMEREN LEC LCL1

Pace Project No.: 60413961

SAMPLE DUPLICATE: 3252271						
		60413961001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L	18.2	18.2	0	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	247	244	1	15	
SAMPLE DUPLICATE: 3252276		60415008021	Dup		Мах	
SAMPLE DUPLICATE: 3252276 Parameter	Units	60415008021 Result	Dup Result	RPD	Max RPD	Qualifiers
Parameter	Units mg/L		•			Qualifiers
		Result	Result	RPD 1	RPD	Qualifiers

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.



Project:	AMEREN LE		.1										
Pace Project No.:	60413961												
QC Batch:	817968			Anal	ysis Metho	d: E	PA 300.0						
QC Batch Method:	EPA 300.0			Anal	ysis Descri	ption: 3	800.0 IC Anio	ons					
				Labo	oratory:	F	Pace Analytic	cal Servi	ices - Kansas	s City			
Associated Lab Sar	mples: 6041	139560	024, 6041395602	25, 604139	61002, 604	13961003							
METHOD BLANK:	3253027				Matrix: W	/ater							
Associated Lab Sar	mples: 6041	139560	24, 6041395602	25, 604139	61002, 604	13961003							
				Bla	nk	Reporting							
Para	meter		Units	Res	sult	Limit	MDL		Analyzed	Qı	ualifiers	;	
Chloride			mg/L		<0.53	1.0	)	0.53	11/14/22 08:4	48			
Fluoride			mg/L		<0.12	0.20	)		11/14/22 08:4				
Sulfate			mg/L		<0.55	1.0	)	0.55	11/14/22 08:4	48			
LABORATORY CO	NTROL SAMP	LE:	3253028										
				Spike	LC	S	LCS	%	Rec				
Para	meter		Units	Conc.	Res	sult	% Rec	Lir	nits (	Qualifiers			
Chloride			mg/L		5	4.8	95		90-110				
Fluoride			mg/L	2	2.5	2.5	100	1	90-110				
Sulfate			mg/L		5	4.9	97		90-110				
MATRIX SPIKE & N	MATRIX SPIKE	E DUPL	_ICATE: 3253	029		3253030							
				MS	MSD								
			60413959007	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	er	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride		mg/L	17.9	5	5	24.0	23.8	12	1 118	80-120	1	15	E,M1
Fluoride		mg/L	<0.12	2.5	2.5	2.6	2.5	10	2 98	80-120	4	15	
Sulfate		mg/L	413	250	250	685	685	108	8 108	80-120	C	15	
SAMPLE DUPLICA	TE: 325303 <sup>,</sup>	1											
				604139	59007	Dup			Max				
Para	meter		Units	Res	sult	Result	RPD		RPD	Qualif	iers		
Chloride			mg/L		17.9	18.0	)	0	15	 5			
			mg/L		<0.12	<0.12	2		15	5			
Fluoride													

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### **REPORT OF LABORATORY ANALYSIS**



QC Batch:	8179	974		Analy	sis Metho	d:	EPA 300.0						
QC Batch I	Method: EPA	300.0		Analys	sis Descri	ption:	300.0 IC Ani	ons					
				Labor			Pace Analyti	cal Ser	vices - Kansa	as City			
Associated	d Lab Samples:	6041396100	4, 60413961005										
METHOD	BLANK: 32530	)37		l	Matrix: W	ater							
Associated	d Lab Samples:	6041396100	4, 60413961005										
	Parameter		Units	Blan Resu		Reporting Limit	MDL		Analyzed	d Qu	ualifiers		
Chloride			mg/L		<0.53	1.	 N	0.53	11/14/22 15				
Fluoride			mg/L		<0.33 <0.12	0.2		0.33	11/14/22 15				
Sulfate			mg/L		<0.55	1.		0.55	11/14/22 15				
METHOD	BLANK: 32557	63			Matrix: W	ater							
	d Lab Samples:		4, 60413961005										
	•			Blan	k	Reporting							
	Parameter		Units	Resu		Limit	MDL		Analyzed	d Qu	ualifiers		
Chloride			mg/L		0.60J	1.	0	0.53	11/15/22 08	3:48			
Fluoride			mg/L		<0.12	0.2	0	0.12	11/15/22 08	8:48			
Sulfate			mg/L		<0.55	1.	0	0.55	11/15/22 08	3:48			
			-										
	ORY CONTROL	SAMPLE: 3	253038										
		SAMPLE: 3		Spike	LC		LCS % Rec		Rec				
LABORAT	ORY CONTROL Parameter	SAMPLE: 3	Units	Conc.	Res	sult	% Rec	L	imits	Qualifiers			
LABORAT		SAMPLE: 3	Units mg/L	Conc.		sult 4.8	% Rec 96	L	imits 90-110				
LABORAT Chloride Fluoride		SAMPLE: 3	Units	Conc.	Re: 5 5	sult	% Rec	L	imits		_		
LABORATO Chloride Fluoride Sulfate	Parameter		Units mg/L mg/L mg/L	Conc.	Re: 5 5	4.8 2.5	% Rec 96 100	L	imits 90-110 90-110		_		
LABORATO Chloride Fluoride Sulfate			Units mg/L mg/L	Conc.	Re: 5 5	4.8 4.8 2.5 4.7	% Rec 96 100	L	imits 90-110 90-110		_		
LABORATO Chloride Fluoride Sulfate	Parameter		Units mg/L mg/L mg/L	Conc.	Res	sult 4.8 2.5 4.7	% Rec 96 100 94	L	imits 90-110 90-110 90-110		_		
LABORATO Chloride Fluoride Sulfate LABORATO	Parameter ORY CONTROL		Units mg/L mg/L mg/L 2255764 Units	Conc.	Res 5 5 LC	sult 4.8 2.5 4.7	% Rec 96 100 94 LCS	L	imits 90-110 90-110 90-110 90-110	Qualifiers	_		
LABORATO Chloride Fluoride Sulfate LABORATO	Parameter ORY CONTROL		Units mg/L mg/L mg/L 2255764 Units mg/L	Conc.		sult 4.8 2.5 4.7 Ssult 4.8	% Rec 96 100 94 LCS % Rec	 % 	imits 90-110 90-110 90-110 90-110	Qualifiers			
LABORATO Chloride Fluoride Sulfate LABORATO Chloride Fluoride	Parameter ORY CONTROL		Units mg/L mg/L mg/L 2255764 Units	Conc.		4.8 2.5 4.7 Ssult	% Rec 96 100 94 LCS % Rec 97	L	imits 90-110 90-110 90-110 0 Rec imits 90-110	Qualifiers			
LABORATO Chloride Fluoride Sulfate LABORATO Chloride Fluoride Sulfate	Parameter ORY CONTROL	SAMPLE: 3	Units mg/L mg/L mg/L 255764 Units mg/L mg/L mg/L mg/L	Conc.	Res	sult 4.8 2.5 4.7 SS sult 4.8 2.6	% Rec 96 100 94 LCS % Rec 97 106 98	L	imits 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers	_		
LABORATO Chloride Fluoride Sulfate LABORATO Chloride Fluoride Sulfate	Parameter ORY CONTROL Parameter	SAMPLE: 3	Units mg/L mg/L 255764 Units mg/L mg/L mg/L mg/L mg/L	Conc.	Res LC Res MSD	sult     4.8       4.7     4.7       Solut     4.8       4.8     4.8       2.6     4.9       3253040	% Rec 96 100 94 LCS % Rec 97 106 98	L	imits 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers			
LABORATO Chloride Fluoride Sulfate LABORATO Chloride Fluoride Sulfate	Parameter ORY CONTROL Parameter	SAMPLE: 3	Units mg/L mg/L mg/L 255764 Units mg/L mg/L mg/L mg/L mg/L mg/L	Conc.	Res	sult 4.8 2.5 4.7 S S sult 4.8 2.6 4.9	% Rec 96 100 94 LCS % Rec 97 106 98	L	imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers		Max	Qual
LABORATO Chloride Fluoride Sulfate LABORATO Chloride Fluoride Sulfate	Parameter ORY CONTROL Parameter	SAMPLE: 3 SPIKE DUPLI	Units mg/L mg/L mg/L 255764 Units mg/L mg/L mg/L mg/L mg/L mg/L	Conc.	MSD Spike	sult 4.8 2.5 4.7 3253040 MS	% Rec 96 100 94 LCS % Rec 97 106 98 MSD	L % L MS % Rec	imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers Qualifiers % Rec Limits		RPD	Qual E,M1
LABORATO Chloride Fluoride Sulfate LABORATO Chloride Fluoride Sulfate MATRIX S	Parameter ORY CONTROL Parameter	SAMPLE: 3	Units mg/L mg/L mg/L 2255764 Units mg/L mg/L mg/L mg/L CATE: 325303 60415066004 Result	Conc.	MSD Spike Conc.	sult 4.8 2.5 4.7 3253040 MS Result	% Rec 96 100 94 LCS % Rec 97 106 98 MSD Result	MS % Rec 1!	imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers Qualifiers Qualifiers		RPD 15	

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

### **REPORT OF LABORATORY ANALYSIS**



Project: AMEREN LEC LCL1

Pace Project No.: 60413961

SAMPLE DUPLICATE: 3253041						
		60415066004	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Chloride	mg/L		264	1	15	
Fluoride	mg/L	<0.12	<0.12		15	
Sulfate	mg/L	15.7	15.6	0	15	

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

### **REPORT OF LABORATORY ANALYSIS**



### QUALIFIERS

Project: AMEREN LEC LCL1

Pace Project No.: 60413961

### 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.
- 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.



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LEC LCL1 Pace Project No.: 60413961

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60413956008	L-MW-26	EPA 200.7	818348	EPA 200.7	818468
60413961001	L-TMW-2	EPA 200.7	818362	EPA 200.7	818499
60413956024	L-BMW-1S	EPA 200.7	818348	EPA 200.7	818468
60413956025	L-BMW-2S	EPA 200.7	818353	EPA 200.7	818470
60413961002	L-TMW-1	EPA 200.7	818362	EPA 200.7	818499
60413961003	L-TMW-3	EPA 200.7	818362	EPA 200.7	818499
60413961004	L-LCL1-DUP-1	EPA 200.7	818362	EPA 200.7	818499
60413961005	L-LCL1-FB-1	EPA 200.7	818362	EPA 200.7	818499
60413956008	L-MW-26	SM 2320B	815835		
60413961001	L-TMW-2	SM 2320B	816118		
60413956024	L-BMW-1S	SM 2320B	816350		
60413956025	L-BMW-2S	SM 2320B	816350		
60413961002	L-TMW-1	SM 2320B	816349		
60413961003	L-TMW-3	SM 2320B	816349		
60413961004	L-LCL1-DUP-1	SM 2320B	816349		
60413961005	L-LCL1-FB-1	SM 2320B	816349		
60413956008	L-MW-26	SM 2540C	815561		
60413961001	L-TMW-2	SM 2540C	815775		
60413956024	L-BMW-1S	SM 2540C	816279		
60413956025	L-BMW-2S	SM 2540C	816279		
60413961002	L-TMW-1	SM 2540C	815993		
60413961003	L-TMW-3	SM 2540C	815993		
60413961004	L-LCL1-DUP-1	SM 2540C	815993		
60413961005	L-LCL1-FB-1	SM 2540C	815993		
60413956008	L-MW-26	EPA 300.0	817771		
60413961001	L-TMW-2	EPA 300.0	817772		
60413956024	L-BMW-1S	EPA 300.0	817968		
60413956025	L-BMW-2S	EPA 300.0	817968		
60413961002	L-TMW-1	EPA 300.0	817968		
60413961003	L-TMW-3	EPA 300.0	817968		
60413961004	L-LCL1-DUP-1	EPA 300.0	817974		
60413961005	L-LCL1-FB-1	EPA 300.0	817974		

	WO# : 1	60413961
Pace	DC#_Title: ENV-FRM-LENE-0009_Sample Con	
	Revision: 2 Effective Date: 01/12/2022 Issue by Level	u di
Client Name:	SP Golden	
Courier: FedEx UPS [	U VIA Clay PEX ECI Pace Xroads C	Client 🗆 Other 🗆
Tracking #:	Pace Shipping Label Used? Yes D	
Custody Seal on Cooler/Box F	,	
-	Wrap □ Bubble Bags □ Foam □ Nonc □ Other 2999 Type of Ice: Wat Blue None /	
		Date and initials of person
Temperature should be above freez		examining contents:
Chain of Custody present:		
Chain of Custody relinquished:	AYes DNO DN/A	
Samples arrived within holding t	time:	
Short Hold Time analyses (<7)	2hr):	
Rush Turn Around Time reque		
Sufficient volume:		
Correct containers used:	ØYes □No □N/A	
Pace containers used:		
Containers intact:		
Unpreserved 5035A / TX1005/10	006 soils frozen in 48hrs? □Yes □No	
Filtered volume received for diss	solved tests?	
Sample labels match COC: Date	e / time / ID / analyses	
Samples contain multiple phases	s? Matrix: M TYes The DN/A	
Containers requiring pH preserva (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCI<2; NaOH>9 Sulf (Exceptions: VOA, Micro, O&G, KS <sup>-1</sup> Cyanide water sample checks: Lead acetate strip turns dark? (R Potassium iodide test strip turns	TPH, OK-DRO)     LOT#:     55/91     date/time added.       Record only)     □Yes □No	lot #'s of preservative and the
Trip Blank present:		
Headspace in VOA vials ( >6mm		
Samples from USDA Regulated A		
Additional labels attached to 503	5A / TX1005 vials in the field? □Yes □No ☑N/A	
Client Notification/ Resolution:	formal second	Y / N
Person Contacted: Comments/ Resolution:	Date/Time:	
Project Manager Review:	Date:	

Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required C	lien		Section B Required Project Information:	roject li	Informatic	:uq				os ⊑	Section C Invoice Information:	o ormation:								Pa	Page: 1	o	-
Company:	WSP Golder		Report To: Jeffrey Ingram	Jeffre	ey Ingra	am				At	Attention:						Γ			l	-		
Address:	701 Emerson Road, Suite 250		Copy To:	Eric (	Eric Schnieder	der				ŏ	Company Name:		WSP Golder	older			1 H	REGULATORY AGENCY	RY AGE	ΥCY		-	1.4.1.1
	Creve Coeur, Missouri, 63141	Aissouri, 63141								Ac	Address:							NPDES	D.	GROUND WATER	ATER	DRIN	DRINKING WATER
Email To:	jeffrey ingram@golder.com	2golder.com	Purchase Order No.:	Irder No		COC #4				Pa Re	Pace Quote Reference						L	- UST	Ĺ	RA		OTHER	
Phone: 6;	636-724-9191 F	Fax: 636-724-9323	Project Name:		Amerer	n Labad	ie Ener	Ameren Labadie Energy Center	LCL1	Pa	Pace Project Manager		Jamie Church	LCH LCH			S	Site Location	E		all line		the second
Requested	Requested Due Date/TAT: S	Standard	Project Number.		153140	153140604.0001	01			Pa	Pace Profile #:		9285, line 3	_			Γ	STATE:	 	QM			
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F-ALL-Q-020rev.08, 12-Oct-2007

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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.

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

"Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1,5% per month for any invoices not paid within 30 days.



### MEMORANDUM

Project No. 153140604.0001

DATE January 10, 2023

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 – DETECTION MONITORING – DATA PACKAGE 60413961

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

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

### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Company Name: WSP USA Inc.	Project Manager: <u>J. Ingram</u>	
Project Name: Ameren LEC - LCL1	Project Number: 153140604	
Reviewer: R.Pommerenke	Validation Date: 1/10/2023	
Laboratory: <u>Pace Analytical Services</u> Analytical Method (type and no.): <u>EPA 200.7/200.8 (Total Metals</u> Matrix: Air Soil/Sed. Water Waste Sample Names <u>L-TMW-2, L-TMW-1, L-TMW-3, L-LCL1-DUP-1, L-LC</u>	SDG #: <u>60413961</u> s); SM2320B (Alkalinity); SM2540C (TDS); EPA 300.0 (Anions) CL1-FB-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 In	nformation	YES	NO	NA	COMMENTS
a)	Sampling dates noted?	x			10/25/2022 - 10/27/2022
b)	Sampling team indicated?	x			GTM/PCS/SMA
c)	Sample location noted?	X			
d)	Sample depth indicated (Soils)?			X	
e)	Sample type indicated (grab/composite)?	x			Grab
f)	Field QC noted?	x			See notes.
g)	Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turb
h)	Field Calibration within control limits?		x		See notes.
i)	Notations of unacceptable field conditions/performa	nces fro	om field lo	ogs or field no	ites?
			x		
j)	Does the laboratory narrative indicate deficiencies?			X	
	Note Deficiencies:				
Chain-	of-Custody (COC)	YES	NO	NA	COMMENTS
a)	Was the COC properly completed?	X			
b)	Was the COC signed by both field			_	
	and laboratory personnel?	х			
c)	Were samples received in good condition?	х			
-					
Genera	al (reference QAPP or Method)	YES	NO	NA	COMMENTS
a)	Were hold times met for sample pretreatment?	х			
b)	Were hold times met for sample analysis?	X			
c)	Were the correct preservatives used?	х			
d)	Was the correct method used?	х			
e)	Were appropriate reporting limits achieved?	X			
f)					
f)	Were any sample dilutions noted?	×			See notes.

### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Blanks		YES	NO	NA	COMMENTS
a)	Were analytes detected in the method blank(s)?	X			See notes.
b)	Were analytes detected in the field blank(s)?	х			See notes.
c)	Were analytes detected in the equipment blank(s)?			х	
d)	Were analytes detected in the trip blank(s)?			X	
Labora	tory 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			
Duplica	ites	YES	NO	NA	COMMENTS
a)	Were field duplicates collected (note original and du	ıplicate	sample n	ames)?	
		X			L-LCL1-DUP-1 @ L-TMW-3
b)	Were field dup. precision criteria met (note RPD)?		x		See notes.
c)	Were lab duplicates analyzed (note original and dup	olicate s	samples)?	)	
		х			
d)	Were lab dup. precision criteria met (note RPD)?		X		See notes.
Blind S	tandards	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?		x		See notes.
	Recovery could not be calculated since sample contained high concentration of analyte?			X	
b)	Was MSD accuracy criteria met?		х		See notes.
	Recovery could not be calculated since sample contained high concentration of analyte?			X	
c)	Were MS/MSD precision criteria met?				RPD Max (6%) < 15%

### Comments/Notes:

Dilutions:

Sulfate analyzed at a dilution. No qualification necessary.

### Blanks:

MB3254663: Calcium (57.2J), Manganese (0.71J). Associated with samples -008 and -024. Results > 10x blank result and > RL: no qualification necessary.

MB3254702: Iron (19.1J), Manganese (0.76J). Associated with sample -025. Results < RL, reported as ND at RL.

### **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

### Comments/Notes:

MB3254745: Manganese (0.48J), Potassium (171J). Associated with samples -001 through -005.
Results > 10 x blank result and > RL: no qualification necessary. Results < RL. reported as ND at RL.

MB3244507: Alkalinity (4.8J). Associated with sample -008. Results > 10 x blank result and > RL: no qualification necessary.

MB3252261: Chloride (0.59J). Associated with samples -008. Results > 10 x blank result and > RL: no qualification necessary.

MB3255739: Chloride (0.57J). Associated with sample -001. Results > 10 x blank result and > RL: no qualification necessary.

MB3256514: Chloride (0.60J). Associated with sample -001. Results > 10 x blank result and > RL: no qualification necessary.

MB3255763: Chloride (0.60J). Associated with samples -004 and -005. Results < 10x blank result and > RL, qualified as estimate. Results < RL, reported as ND at RL.

L-LCL1-FB-1 @ L-TMW-1: Calcium (52.1J), Manganese (0.35J), Potassium (139J), Alkalinity (4.7J), Total Dissolved Solids (7.0), Chloride (0.62J). Results < 10x blank but > RL: qualified as estimate.

### Duplicates:

L-LCL1-DUP-1 @ L-TMW-3: Fluoride detected in DUP sample but not in parent sample.

Sample Duplicate 3246754: Alkalinity detected in parent sample but not in duplicate. Performed on unrelated sample: no qualification necessary.

Sample Duplicate 3245282: Total Dissolved Solids detected in parent sample but not in duplicate. Performed on unrelated sample: no qualification necessary.

### MS/MSD:

3254665/3254666: MS % recovery high for Calcium. Associated with L-MW-26. Only one QC indicator out of control limits: no qualification necessary.

3254706: MS % recovery low (<10%) for Boron, Calcium, Magnesium, and Sodium. MS % recovery low for Iron. MS % recovery high for Potassium. Performed on unrelated sample: no qualification necessary.

3254747/3254748: MS/MSD % recovery low for Calcium. Associated with sample L-TMW-2.

3252263/3252264: MS/MSD % recovery high for Chloride and Fluoride. Associated with sample L-MW-26.

3252266/3252267: MS/MSD % recovery high for Fluoride. Performed on unrelated sample: no qualification necessary.

3252272/3252273: MS % recovery low for Fluoride. Only one QC indicator out of control limits for Fluoride:

no qualification necessary. MS/MSD % recovery high for Sulfate. Associated with sample L-TMW-2.

3252274/3252275: MS/MSD % recovery high for Sulfate. Performed on unrelated sample: no qualification necessary.

3253029/3253030: MS % recovery high for Chloride. Performed on unrelated sample: no qualification necessary.

3253039/3253040: MS/MSD % recovery high for Chloride and Sulfate. Performed on unrelated sample: no qualification necessary.

### **QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST**

### Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-BMW-2S	Iron	50.0	U	Detected in MB, Result < RL
"	Manganese	5.0	U	n
L-LCL1-DUP-1	Chloride	3.2	J	Detected in MB, 10x blank > Result > RL
"	Fluoride	0.13	J	Detected in DUP, not in parent sample
L-LCL1-FB-1	Chloride	1.0	U	Detected in MB, Result < RL
"	Manganese	5.0	U	n
"	Potassium	500	U	n
L-MW-26	Chloride	10.3	J+	MS/MSD % recovery outside of control limits
L-TMW-1	Chloride	3.2	J	Detected in FB, 10x blank > Result > RL
L-TMW-2	Calcium	246000	J-	MS/MSD % recovery outside control limits
"	Sulfate	247	J+	n
L-TMW-3	Fluoride	0.20	UJ	Detected in DUP, not in parent sample
		$\overline{}$		
			<u> </u>	

### APPENDIX B

# Alternative Source Demonstration -November 2021 Sampling Event

# SOLDER

### REPORT

## LCL1 - Alternative Source Demonstration

Labadie Energy Center, Franklin County, Missouri, USA

Submitted to:

### Ameren Missouri

1901 Chouteau Avenue, St. Louis, MO 63103

Submitted by:

### Golder Associates USA, Inc.

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

+1 314 984-8800

153140604

June 24, 2022

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	2.2	Utility Waste Landfill Cell 1 – LCL1	.1		
	2.3	CCR Rule Groundwater Monitoring	.2		
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### **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 Golder Associates Inc.

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).

### GOLDER ASSOCIATES USA INC.



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

### **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 which 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<sup>-7</sup> 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 installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for

groundwater. Three (3) 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 (11) sampling events were performed prior to October 27, 2016 at most of the state required UWL monitoring wells, and four (4) 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 was completed prior to the October 17, 2017 deadline; (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and eight (8) baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of the CCR Rule.

The groundwater monitoring system for the LCL1 consists of six (6) monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Two (2) 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 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 (8) 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. November 2021 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 (8) 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 after the February-April 2021 sampling event.

In November 2017, no exceedances were reported. In May 2018, four (4) initial exceedances were identified including boron, fluoride, and total dissolved solids (TDS) at TMW-1, as well as fluoride at TMW-2. Verification sampling results confirmed all four (4) SSIs. An ASD was prepared for the May 2018 results and is available in the 2018 LCL1 Annual Report; that ASD concluded that the SSIs observed for the May 2018 sampling event were not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In November 2018, four (4) initial exceedances were identified for boron, chloride and fluoride at TMW-1 and fluoride at TMW-2, three (3) of which were the same at those reported during May 2018. Verification sampling results confirmed only the fluoride at TMW-1 result. An ASD was prepared for the November 2018 results and is available in the 2019 LCL1 Annual Report; the ASD also concluded that the confirmed SSI observed for November 2018 was not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In May 2019, seven (7) initial exceedances were identified for pH, calcium, chloride, and fluoride at various wells. Verification sampling results confirmed only chloride at TMW-1. An ASD was prepared for the May 2019 results and is available in the 2019 LCL1 Annual Report. This ASD also concluded that the confirmed SSI observed for May 2019 was not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In November 2019, four (4) initial exceedances were identified for boron, chloride, and TDS at MW-26 and chloride at TMW-1. Verification sampling results only confirmed the three (3) SSIs at MW-26. An ASD was prepared for the November 2019 results and is available in the 2020 LCL1 Annual Report, which concluded that the SSIs observed in the November 2019 sampling event were not caused by the LCL1. The SSI observed for TDS at MW-26 was primarily caused by relatively low calculated UPLs that did not reflect the full, natural geochemical variability within the alluvial aquifer. The SSIs identified for boron and chloride in MW-26 were primarily caused by the LCL1 being downgradient from the LCPA, which is currently in corrective action. The LCPA, and not the LCL1, was identified as the source for the November 2019 SSIs.

In November 2020, six (6) initial exceedances were identified for calcium, chloride, fluoride, sulfate, and TDS at several wells. Verification sampling results only confirmed the four (4) SSIs at TMW-2. The SSIs at TMW-2 for calcium, chloride, sulfate, and TDS were caused by natural geochemical variability, and a relatively small set of baseline data that do not reflect the temporal and spatial geochemical variability within the alluvial aquifer, and not by the LCL1.

In February-April 2021, six (6) initial exceedances were identified for boron, calcium, chloride, fluoride, and TDS at several wells. Verification sampling results only confirmed the one (1) SSI for chloride at MW-26. The SSI at MW-26 for chloride was caused by natural geochemical variability, and a relatively small set of baseline data that do not reflect the temporal and spatial geochemical variability within the alluvial aquifer, and not by the LCL1.

In November 2021, five (5) initial exceedances were identified for calcium, chloride, fluoride, sulfate, and TDS at MW-26 and TMW-2. Verification sampling results confirmed four (4) SSIs for calcium, chloride, sulfate, and TDS at TMW-2. Results from this sampling event are provided in **Table 1**.

# 3.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

The SSIs for calcium, chloride, sulfate, and TDS occurred at monitoring well TMW-2 and the values are presented on **Table 1**. TMW-2 is 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, which is 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 Golder's 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 (8) 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.

# 4.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs at TMW-2 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 indicators 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 gravel roads, and the potential geochemical influence from the road construction materials.

# 4.1 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).

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.	<ul> <li>Boron</li> <li>Molybdenum</li> <li>Lithium</li> <li>Sulfate</li> </ul>		
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.	<ul> <li>Bromide</li> <li>Potassium</li> <li>Sodium</li> <li>Fluoride</li> </ul>		

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.	<ul> <li>Sulfate</li> <li>Fluoride</li> <li>Calcium</li> <li>Boron</li> <li>Bromide</li> <li>Chloride</li> </ul>

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.

## 4.2 Analysis of Key CCR Constituents at TMW-2

#### 4.2.1 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 ( $\mu$ g/L). The intrawell UPL for boron at TMW-2 is 134.3  $\mu$ g/L. Through this same timeframe, boron results in the background wells BMW-1S and BMW-2S, located approximately 2.5 miles to the west of the LCL1, and 1.5 miles west of the LCPA have had values ranging between non-detect (< 50  $\mu$ g/L) to 151  $\mu$ g/L. The interwell UPL for boron (based on LEC background wells) is 147  $\mu$ g/L.

As displayed in **Figure 2**, current boron concentrations at TMW-2 (119 mg/L) are below the UPL for both TMW-2 and the background monitoring wells and are 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 the LCL1.

## 4.3 Evaluation of SSIs at TMW-2

As discussed in **Section 3.0**, there are four (4) verified SSIs from the November 2021 sampling event, all at monitoring well TMW-2 including calcium, chloride, sulfate, and TDS (referred to henceforth 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 3-6** 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 in the November and

subsequent February sampling events, followed by a decrease in the April 2022 sampling event. However, as discussed in **Section 4.2**, the absence of boron with the calcium exceedances indicates that it is unlikely that these SSIs are caused by CCR impacts.

**Table 3**, below, displays concentration data for the COIs, alkalinity, and magnesium from the November 2021 and February 2022 sampling events as compared with the CCR pore-water concentrations from the LCPA (contains bottom ash and fly ash) and the LCPB (fly ash).

Constituent (Units)	November 2021 Result at TMW-2	February 2022 Result at TMW-2	LCPA Porewater Range	LCPB Porewater Range
Calcium (µg/L)	240,000	278,000	76,500 – 106,000	11,400 – 22,600
Chloride (mg/L)	19.7	43.1	15.2 – 25.5	15.6 – 18.4
Sulfate (mg/L)	259	359	254 – 306	728 – 1,060
Total Dissolved Solids (mg/L)	960	1,360 J	528 – 642	1,860 – 2,850
Magnesium (µg/L)	65,700	Not Sampled	184 – 45,500	84.4 - 386
Alkalinity (mg/L)	593	Not Sampled	77.6 – 208	861 – 1,340

Table 3: Comparison of TMW-2 SSIs and Pore-water Concentrations

Notes:

June 24, 2022

µg/L – Micrograms per liter.

mg/L – Milligrams per liter.

J – Result is an estimated value based on data validation.

As displayed in **Table 3**, samples collected from the LCPA and LCPB CCR units indicate that CCR is not a potential source for increases in calcium, chloride (February 2022), or magnesium at TMW-2, as the concentrations in pore-water 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.

# 4.4 Nearby Carbonate Gravel Roadways as Potential Source

In addition to the lines of evidence presented above, the recent placement of a fresh limestone (CaCO<sub>3</sub>)/dolomite (CaMg(CO<sub>3</sub>)<sub>2</sub>) gravel near well TMW-2 is a potential source of the elevated COI concentrations reported in the shallow well TMW-2. TMW-2 is located 30 feet south and east of gravel roads. Additionally, the LCL1, 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. The gravel used for the roadways nearby consists mostly of limestone and dolomite, with lesser amounts of calcite sourced from nearby quarries. Precipitation and recharge of surface water through fresh gravel and associated water-soluble salts leaches soluble components into the shallow groundwater and can cause an increase in the COIs.

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. The LCL1 was constructed in

2015 and 2016 and completed by October 27, 2016. Labadie Bottoms Road was impacted by the construction of the LCL1, and based on aerial imagery from Google Earth, the road was re-graveled between October 2018 and September 2019. As described above, the materials used in the construction of the LCL1 as well as the application of carbonate-based gravel and re-grading of Labadie Bottom Road would contribute to increases in concentrations of COIs.

As displayed on **Figure 7**, calcium concentrations increased simultaneous with the placement of fresh gravel on Labadie Bottom Road in late 2018 to early 2019. Additionally, the increase in calcium since the construction of the adjacent Labadie Bottom Road shows a correlation with the depth to water below ground surface. The correlation between calcium and groundwater levels indicates that some leaching from Labadie Bottom Road gravel is occurring, and when the water table is higher (i.e., more water is present due to higher amounts of precipitation and/or higher river levels), the concentrations become diluted, and concentrations decrease.

In addition to calcium impacts, magnesium, alkalinity, chloride, sulfate, sodium, and TDS display very similar trends to calcium (see **Figures 7-13**), with increasing concentrations since the gravel placement on Labadie Bottom Road and covariation with the water table fluctuation. As indicated above, covariation in the concentrations of these additional COIs is expected due to potential influence of limestone/dolomite gravel on shallow groundwater concentrations.

Increases in these constituents, especially those that are not a result of CCR influence (i.e., calcium, magnesium, chloride, 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 believed to be related to leaching of fresh carbonate gravel and its associated soluble salt sources.

## 5.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY LCL1 IMPACT

Based on the information presented in **Section 4.0** above, the SSIs reported for TMW-2 during the November 2021 monitoring event are not a result of impacts from the LCL1. The SSIs appear to be a result of the new limestone/dolomite gravel placed on Labadie Bottom Road, and/or aggregate materials used in the construction of the LCL1, in the general vicinity of TMW-2. Soluble salts associated with the new gravel roads (calcium, chloride, sulfate, magnesium, alkalinity, and TDS) display an increase in concentration immediately after placement of fresh gravel on Labadie Bottom Road and show covariation with groundwater levels. These trends, coupled with the lack of boron increases, indicate that the changes in concentration are not caused by the LCL1, but rather the adjacent gravel roads.

Finally, the construction of the LCL1, with a base liner constructed of 2-feet of compacted clay overlain by a 60-mil HDPE liner, also limits the potential that the November 2021 SSIs reported for TMW-2 are a result of influence from the LCL1. These lines of evidence indicate that the SSIs observed in TMW-2 are not the result of impacts from the LCL1, but are from recent road gravel placement and leaching from carbonate gravel.

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# Tables

# June 24, 2022

# Table 1November 2021 Detection Monitoring ResultsLCL1 - Utility Waste Landfill Cell 1Labadie Energy Center, Franklin County, MO

		BACKG	ROUND	OUND 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
			N	ovember 202	1 Detection N	Ionitoring Eve	ent				
DATE	NA	11/1/2021	11/1/2021	NA	11/4/2021	NA	11/2/2021	NA	11/2/2021	NA	11/2/2021
рН	SU	6.68	6.97	6.658-7.339	6.81	6.638-7.105	6.89	6.42-7.17	6.87	6.585-7.07	6.73
BORON, TOTAL	μg/L	77.0 J	40.7 J	102.8	68.7 J	121.6	113	134.3	119	136.9	116
CALCIUM, TOTAL	μg/L	260,000	140,000	155,150	146,000	183,389	161,000	205,487	240,000	202,001	161,000
CHLORIDE, TOTAL	mg/L	13.7	1.7 J	6.76	6.2 J	5.718	2.6 J	7.142	19.7	8.621	3.8 J
FLUORIDE, TOTAL	mg/L	ND	0.14 J	0.2118	0.24	0.2975	0.27	0.2972	0.25	0.2626	0.20
SULFATE, TOTAL	mg/L	146	46.2	38.24	29.3	128	61.4	115.5	259	104	40.3
TOTAL DISSOLVED SOLIDS	mg/L	953 J	475 J	543.7	490	733.7	617	815.4	960	815.4	595
				February 2022	Verification	Sampling Eve	nt				
DATE	NA				2/10/2022				2/10/2022		
рН	SU										
BORON, TOTAL	μg/L										
CALCIUM, TOTAL	μg/L								278,000		
CHLORIDE, TOTAL	mg/L								43.1		
FLUORIDE, TOTAL	mg/L				ND						
SULFATE, TOTAL	mg/L								359		
TOTAL DISSOLVED SOLIDS	mg/L								1,360 J		

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.

2. J - Result is an estimated value.

3. NA - Not applicable.

4. Prediction Limits calculated using Sanitas Software.

5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).

6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).

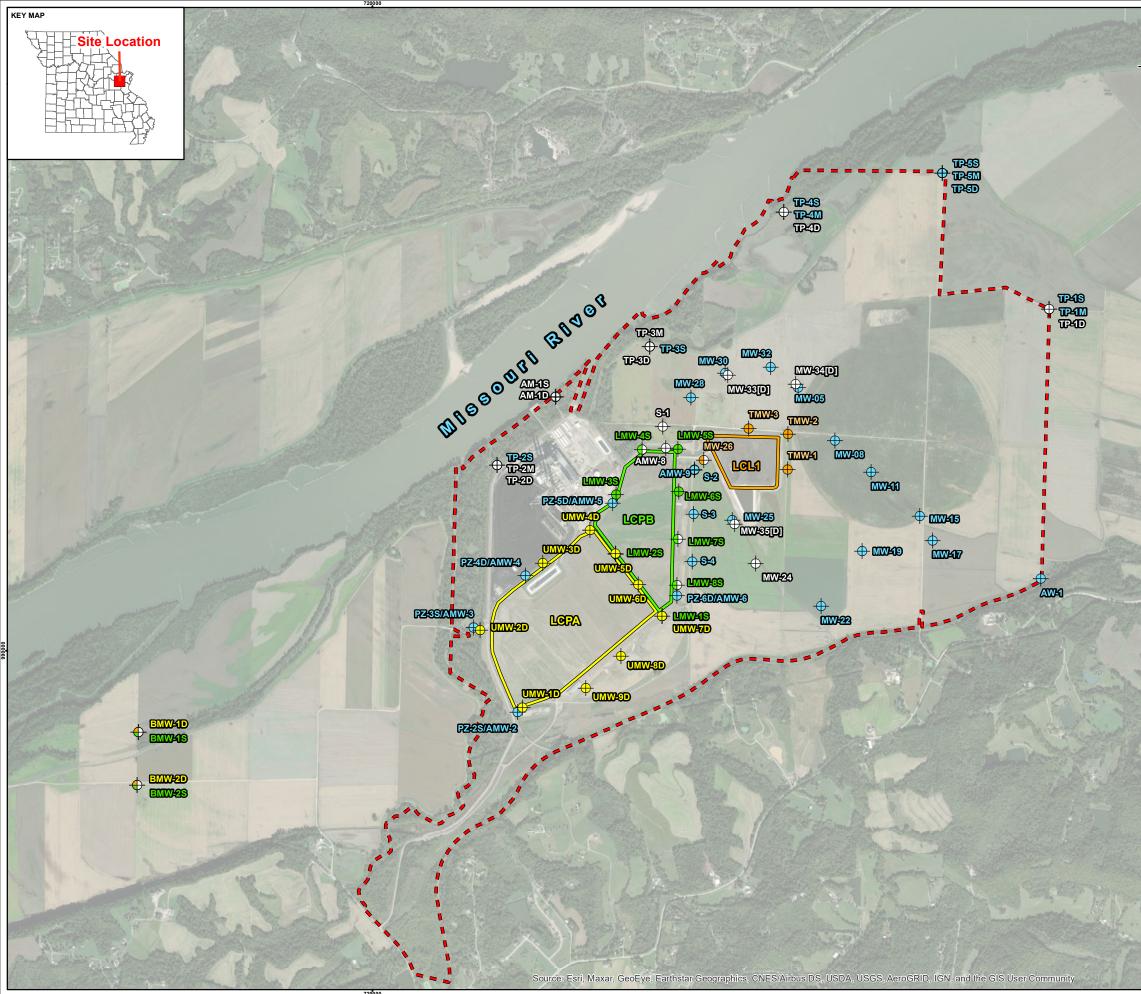
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

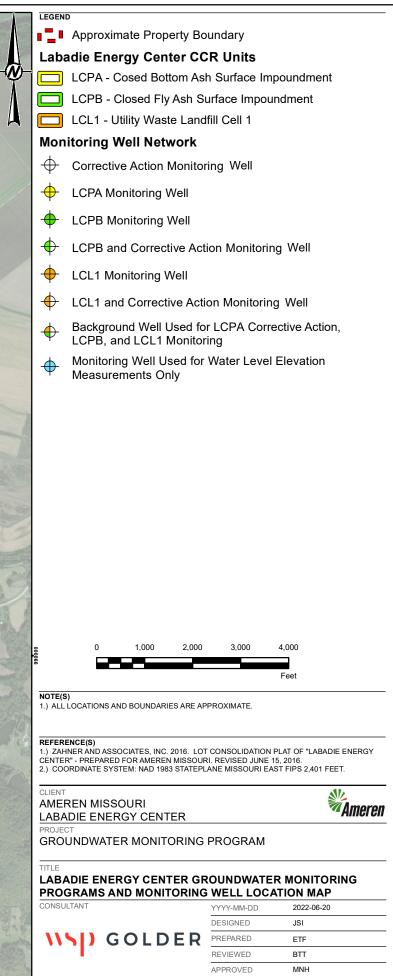
8. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.

Prepared By: EMS Checked By: LMS Reviewed By: MNH

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# Figures





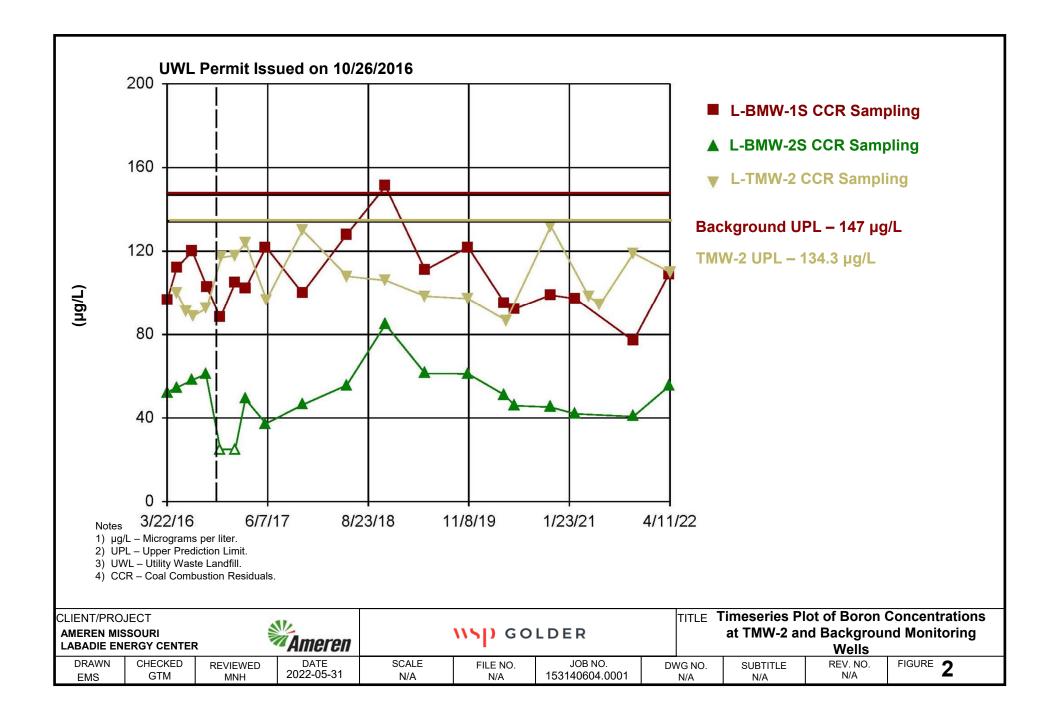
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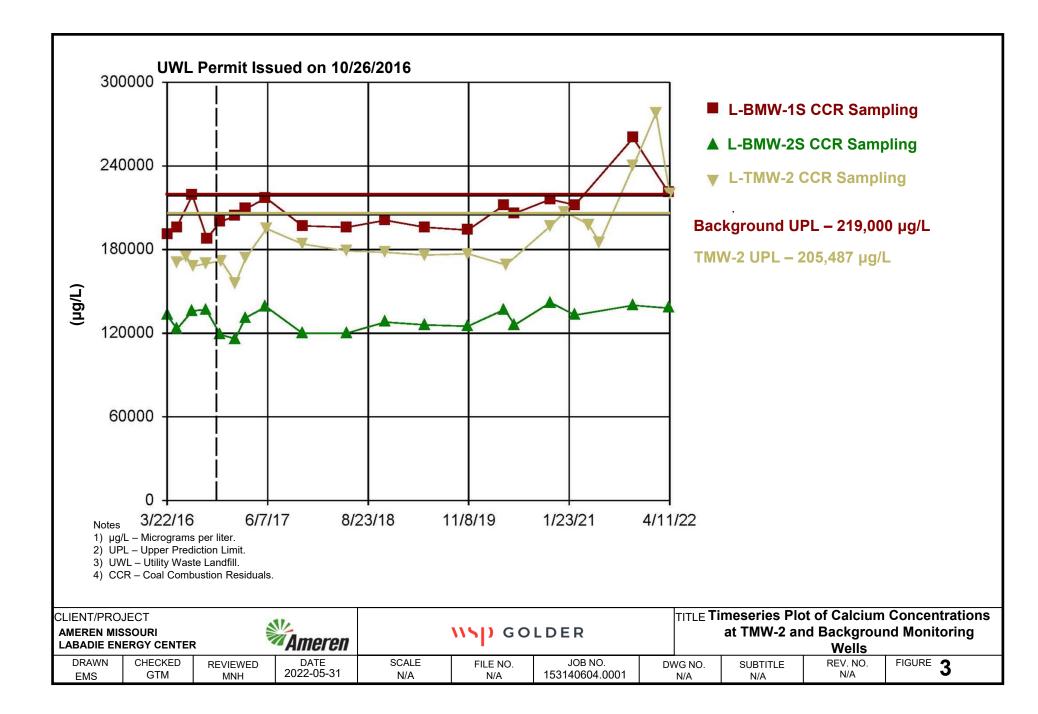
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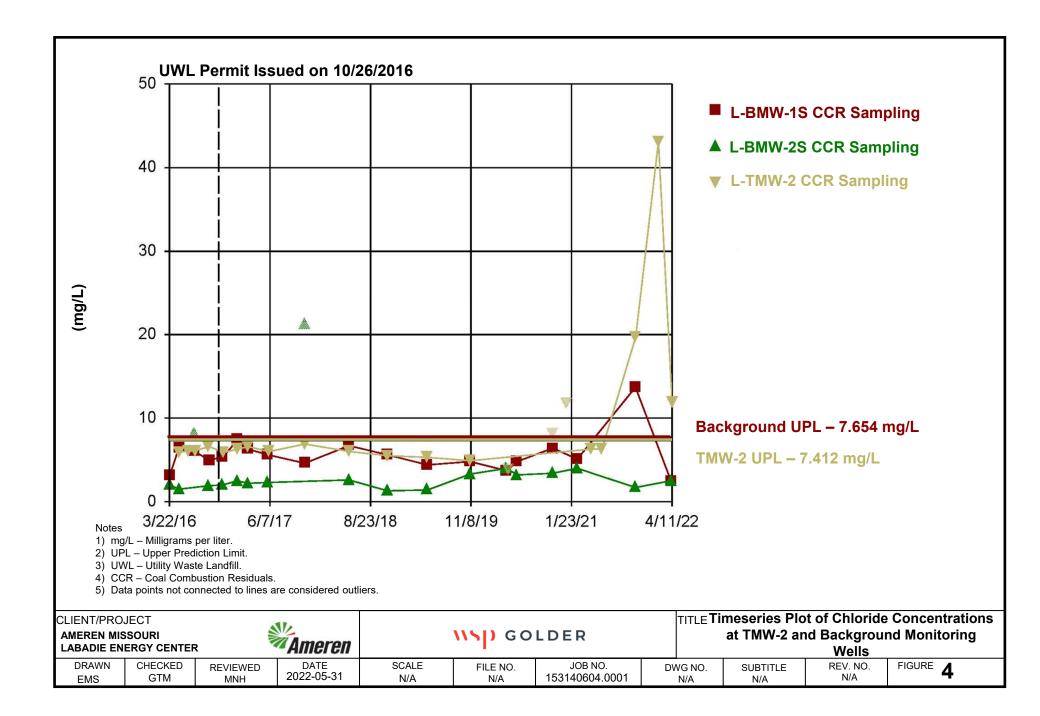
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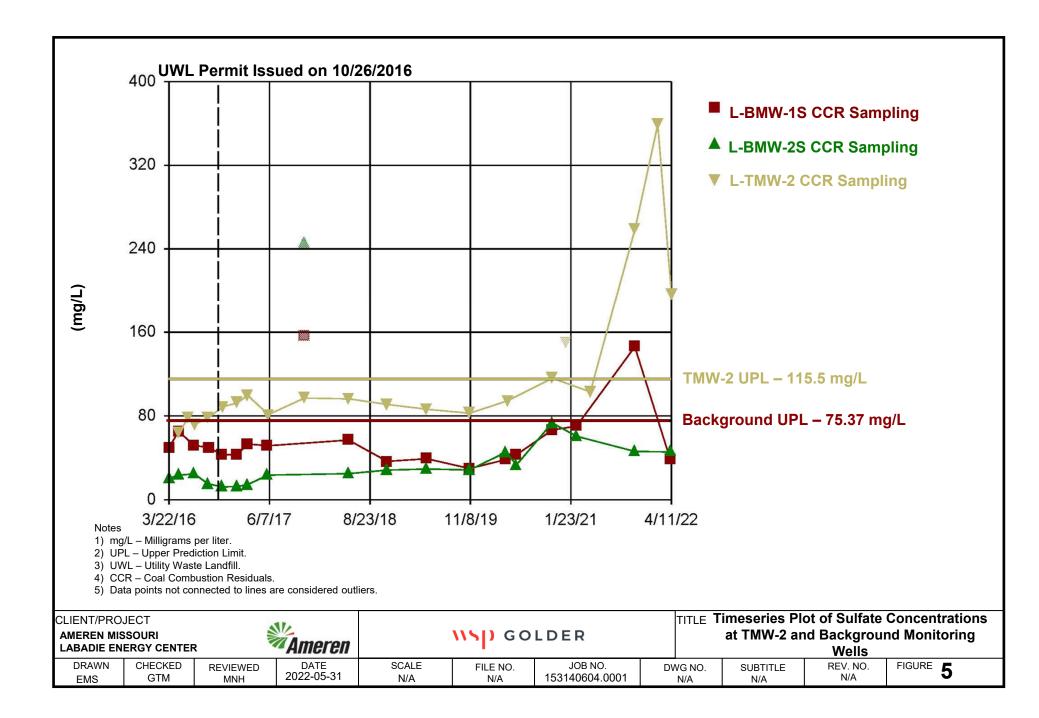
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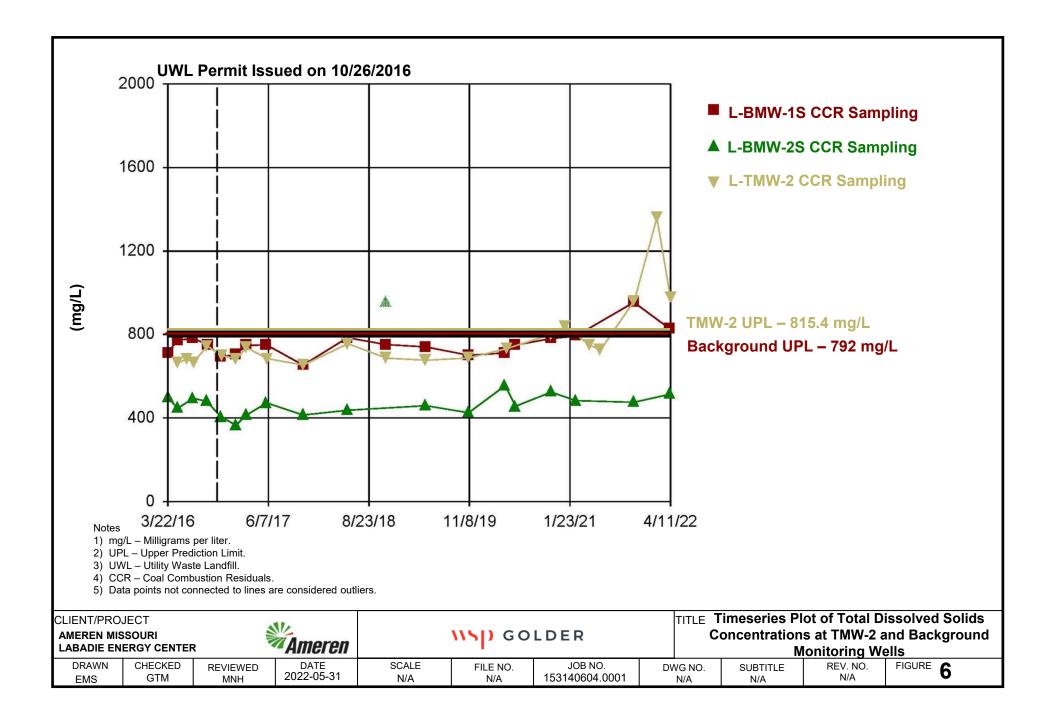
FIGURE

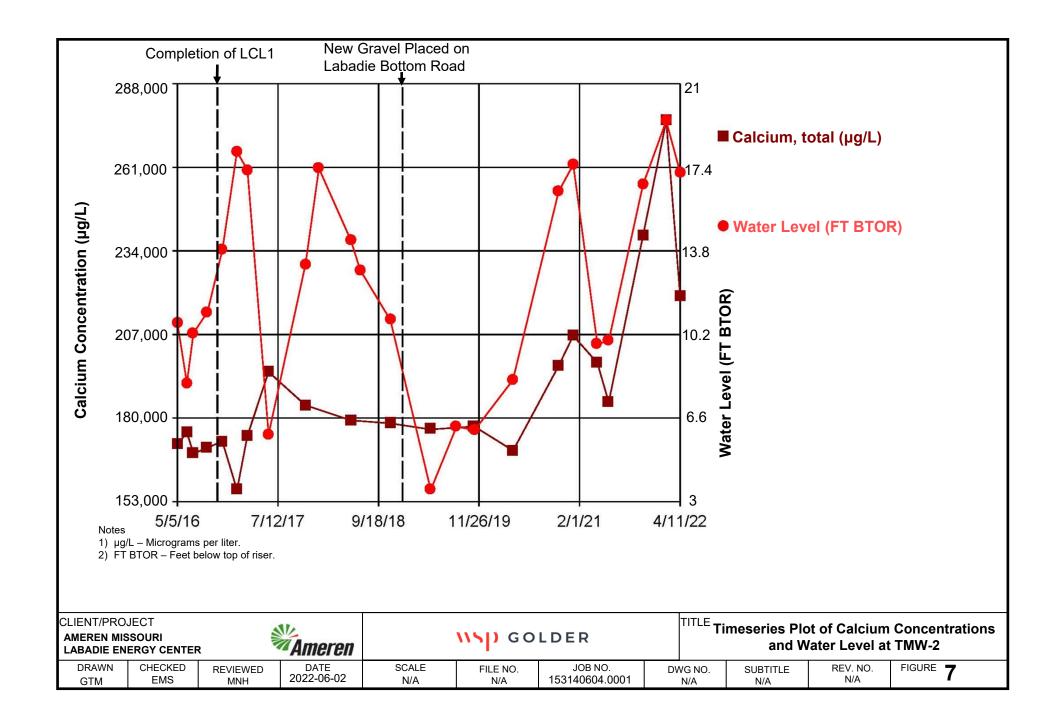


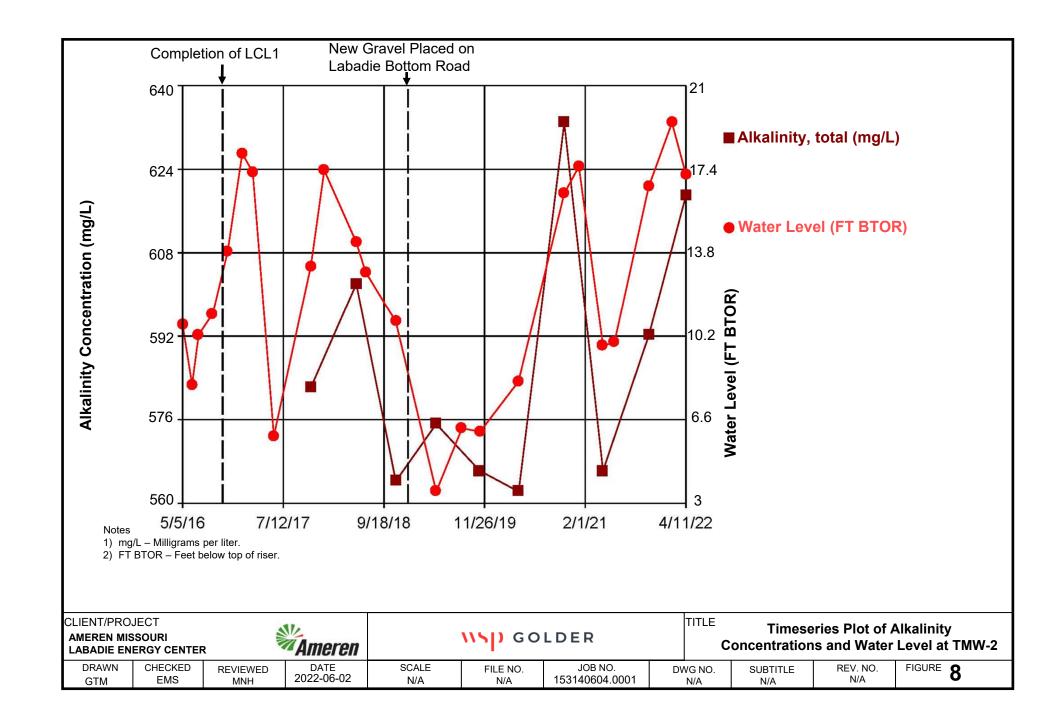


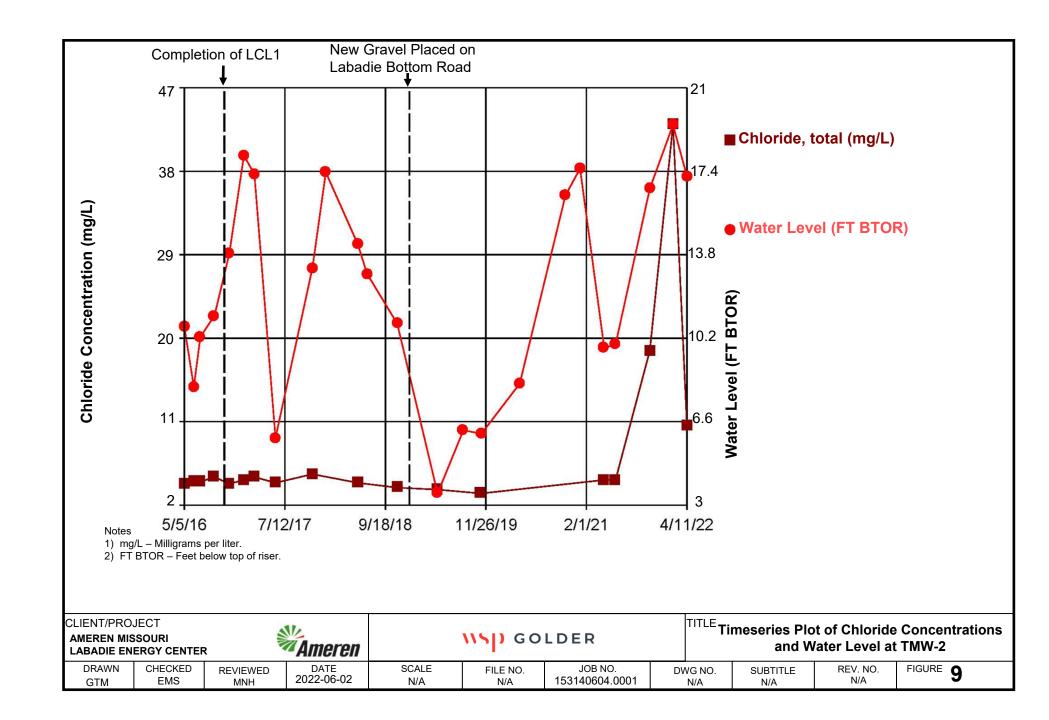


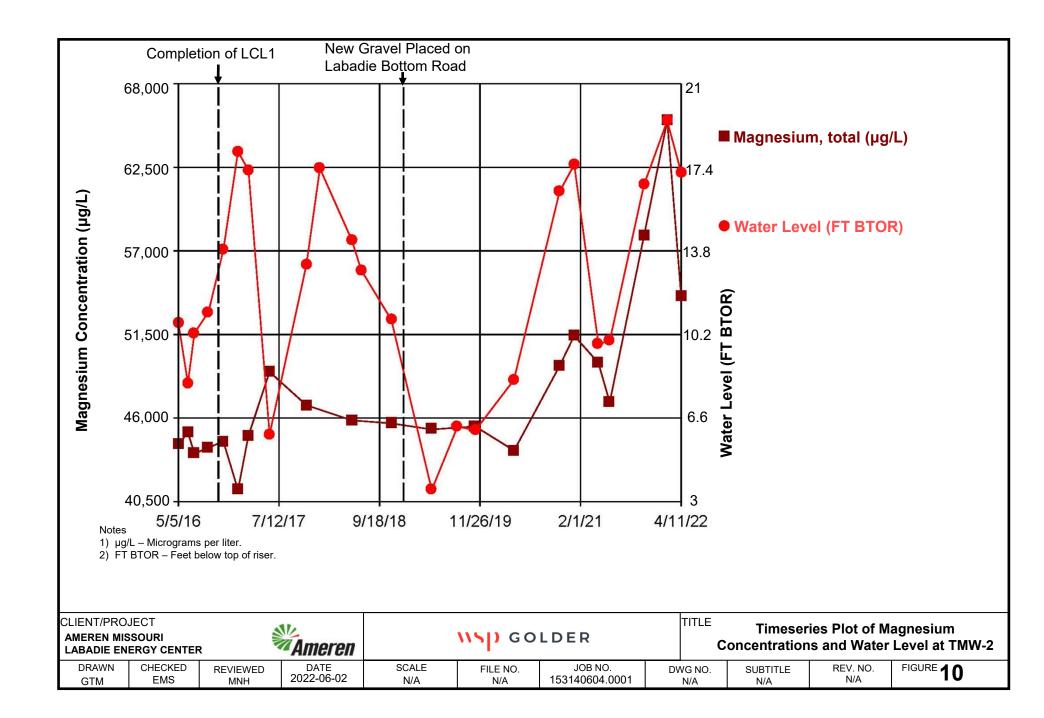


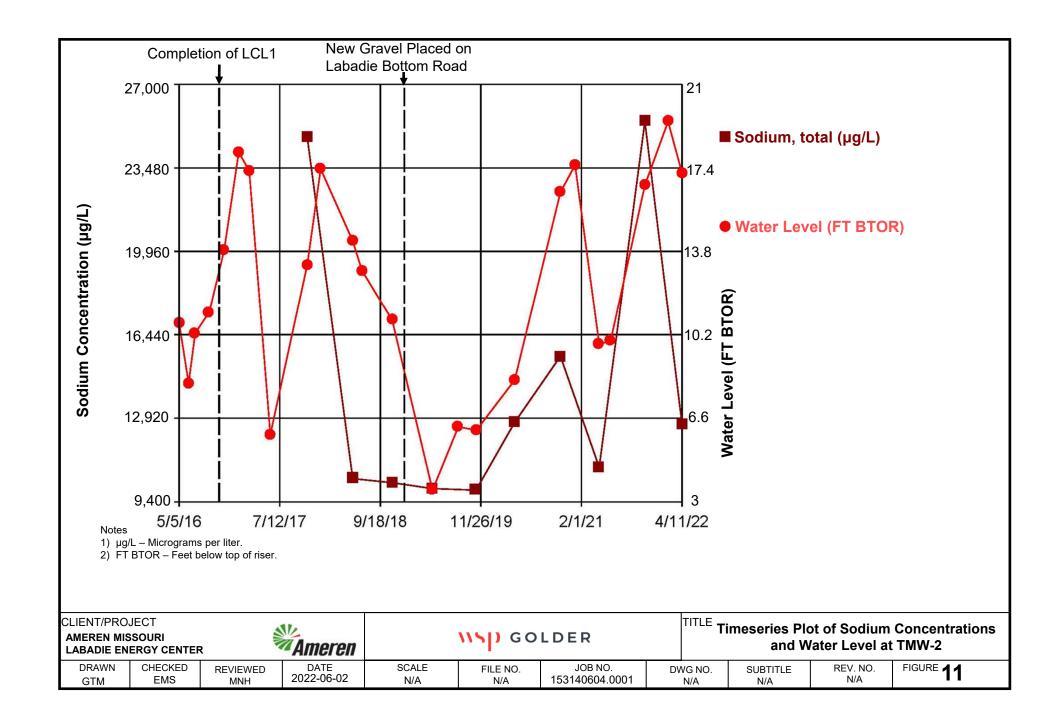


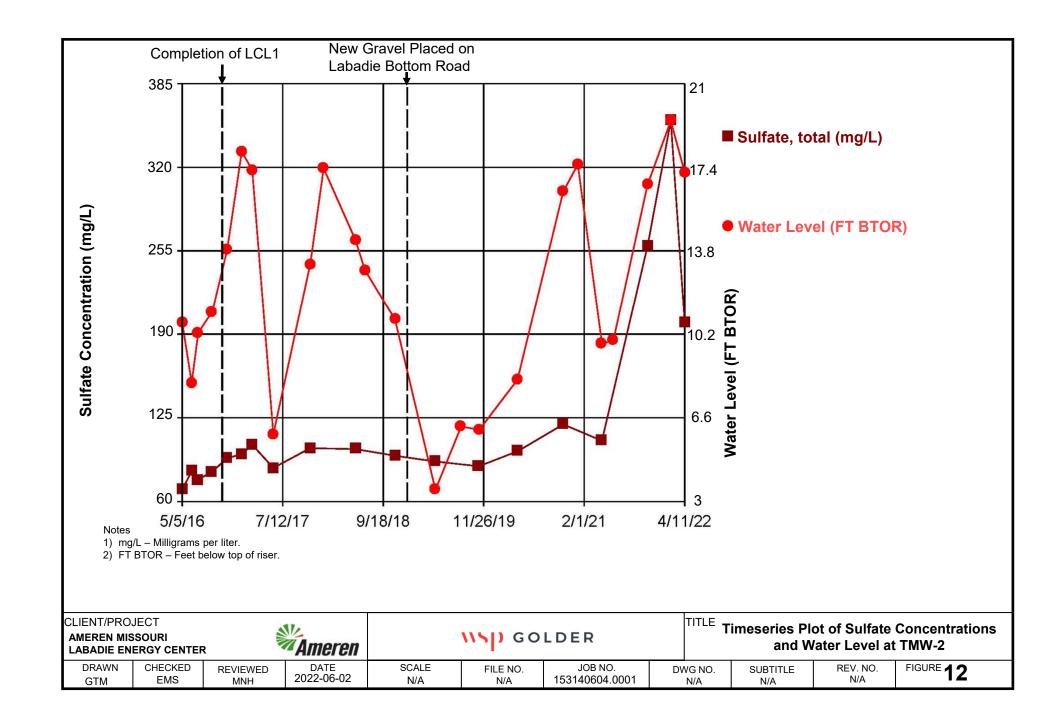


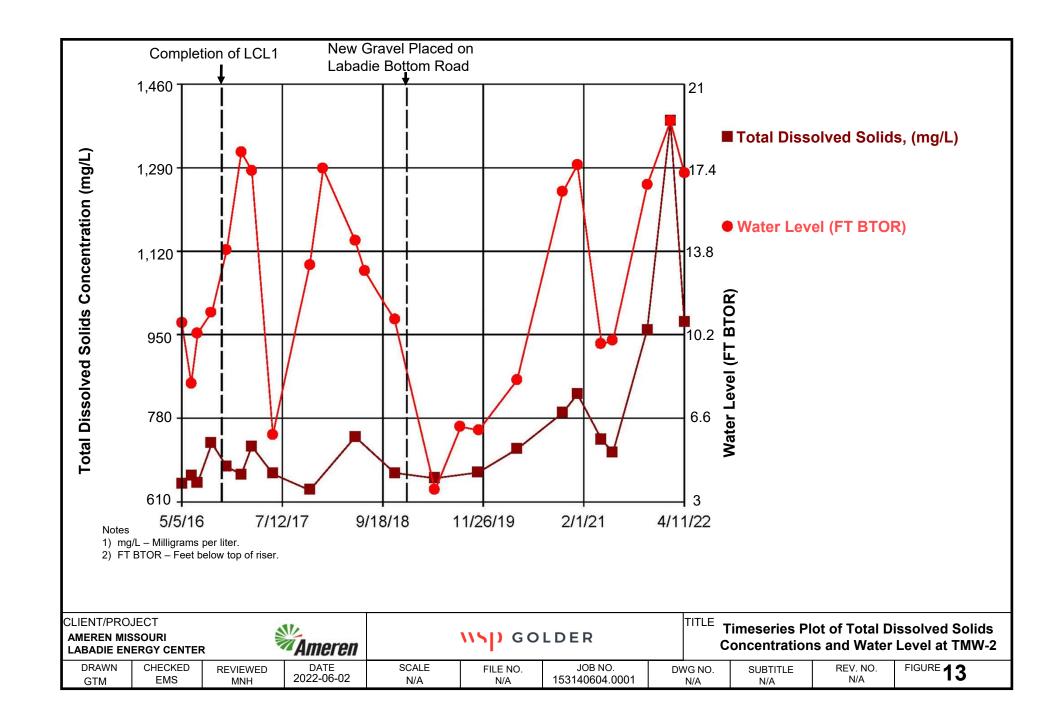












#### APPENDIX C

Alternative Source Demonstration -April 2022 Sampling Event

# **SOLDER**

#### REPORT

# LCL1 - Alternative Source Demonstration

Labadie Energy Center, Franklin County, Missouri, USA

Submitted to:

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November 18, 2022

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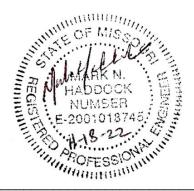
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## **CERTIFICATION STATEMENT**

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 Golder Associates Inc.

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).

#### GOLDER ASSOCIATES USA INC.



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

# **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 which 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<sup>-7</sup> 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 installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for

groundwater. Three (3) 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 (11) sampling events were performed prior to October 27, 2016, at most of the state required UWL monitoring wells, and four (4) 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 was completed prior to the October 17, 2017 deadline; (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and eight (8) baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the LCL1 consists of six (6) monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Two (2) 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 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 (8) 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 (8) 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 February-April 2021 sampling event after an additional four (4) Detection Monitoring events were completed.

Since November 2017, several ASDs have been prepared for MW-26, TMW-1 and TMW-2. These previous ASDs are available in the 2018, 2019, 2020, and 2021 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 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 being downgradient from the LCPA, which is currently in corrective action. Additonally, the potential geochemical influence of construction materials on the shallow alluvial aquifer, such as fresh gravel, during the construction of the LCL1.

In April 2022, four (4) initial exceedances were identified for calcium, chloride, sulfate, and TDS at TMW-2. Verification sampling results confirmed each to be an SSI at TMW-2. Results from this sampling event are provided in **Table 1**.

# 3.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

The SSIs for calcium, chloride, sulfate, and TDS occurred at monitoring well TMW-2 and the values are presented on **Table 1**. TMW-2 is 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, which is 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 Golder's 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 (8) 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 (SAP) uses intrawell 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.

# 4.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs at TMW-2 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

- 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 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 on shallow groundwater.

# 4.1 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).

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.	<ul> <li>Boron</li> <li>Molybdenum</li> <li>Lithium</li> <li>Sulfate</li> </ul>		
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.	<ul> <li>Bromide</li> <li>Potassium</li> <li>Sodium</li> <li>Fluoride</li> </ul>		
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.	<ul> <li>Sulfate</li> <li>Fluoride</li> <li>Calcium</li> <li>Boron</li> <li>Bromide</li> <li>Chloride</li> </ul>		

Table 2: Types of CCR and	Typical Indicator Parameters
---------------------------	------------------------------

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.

# 4.2 Analysis of Key CCR Constituents at TMW-2

#### 4.2.1 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 ( $\mu$ g/L). The intrawell UPL for boron at TMW-2 is 134.3  $\mu$ g/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  $\mu$ g/L) to 151  $\mu$ g/L. The interwell UPL for boron (based on LEC background wells) is 147  $\mu$ g/L.

As displayed in Figure 2, the most recent boron concentration at TMW-2 (110  $\mu$ g/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 the LCL1.

# 4.3 Evaluation of SSIs at TMW-2

As discussed in **Section 3.0**, there are four (4) verified SSIs from the April 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 3-9** are timeseries plots displaying the concentrations of the COIs and other selected constituents 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 in the November and subsequent February sampling events, followed by decreases in the April 2022 and June 2022 sampling events. 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 April 2022 and June 2022 sampling events as compared with the CCR porewater concentrations from the LCPA (contains bottom ash and fly ash) and the LCPB (contains fly ash).

Constituent (Units)	April 2022 Result at TMW-2	June 2022 Result at TMW-2	LCPA Porewater Range	LCPB Porewater Range
Calcium (µg/L)	220,000	215,000	76,500 – 106,000	11,400 – 22,600
Chloride (mg/L)	11.9	10.0	15.2 – 25.5	15.6 – 18.4
Sulfate (mg/L)	197	175	254 – 306	728 – 1,060
Total Dissolved Solids (mg/L)	975	940	528 – 642	1,860 – 2,850
Magnesium (µg/L)	56,300	Not Sampled	184 – 45,500	84.4 – 386
Alkalinity (mg/L)	620	Not Sampled	77.6 – 208	861 – 1,340
Sodium (µg/L)	12,500	Not Sampled	50,500 - 84,000	750,000 – 969,000

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

Notes:

µg/L – Micrograms per liter.

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 pore-water 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.

# 4.4 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<sub>3</sub>)/dolomite (CaMg(CO<sub>3</sub>)<sub>2</sub>) 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 approximately seven (7) 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 Bottoms 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 7. TMW-2<sup>1</sup> 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.
- 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.



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 and concrete that contain water-soluble salts leaches 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

<sup>&</sup>lt;sup>1</sup> 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 closest practicable location for TMW-2 was ~145 feet from the toe of the berm at the LCL1.

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.

# 4.4.1 Hydraulic Connection Between Potential Fresh Carbonate Gravel and Concrete Sources and TMW-2

As discussed in the 2021 LCL1 Annual Report (Golder, 2022), 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 previously, 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 in groundwater between 2019 and 2024.

As displayed in **Figure 3**, calcium concentrations at TMW-2 begin to increase slightly between the April 2020 and November 2020 sampling events, with larger increases occurring during the November 2021 and February 2022 sampling events. 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 pore-water 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 two feet of low-permeability compacted clay overlain by a 60-mil HDPE liner, also limits the potential that the April 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.

### 5.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY LCL1 IMPACT

Based on the information presented in **Section 4.0** above, the SSIs reported for TMW-2 during the April 2022 monitoring event are not a result of impacts from the LCL1. The SSIs appear to be a result of the limestone/dolomite gravel and 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 used in LCL1 construction.

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## Tables

#### November 18, 2022

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

		BACKG	ROUND			GROU	INDWATER M	IONITORING V	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
				April 2022 D	etection Mor	nitoring Event			-		
DATE	NA	4/6/2022	4/6/2022	NA	4/7/2022	NA	4/11/2022	NA	4/11/2022	NA	4/11/2022
рН	SU	7.10	7.06	6.658-7.339	6.94	6.683-7.105	6.95	6.42-7.17	6.93	6.585-7.07	6.82
BORON, TOTAL	μg/L	109	55.2 J	103	96.8 J	121.6	114	134.3	110	136.9	116
CALCIUM, TOTAL	μg/L	221,000	138,000	155,150	140,000	183,389	165,000	205,487	220,000	202,001	141,000
CHLORIDE, TOTAL	mg/L	2.5 J	2.5 J	6.76	5.9 J	5.718	2.9 J	7.142	11.9	8.621	2.5 J
FLUORIDE, TOTAL	mg/L	0.20 J	0.19 J	0.2118	ND	0.2975	0.21	0.2972	ND	0.2626	0.20 J
SULFATE, TOTAL	mg/L	38.6	45.7	38.24	29.0	128	91.9	115.5	197	104	27.8
TOTAL DISSOLVED SOLIDS	mg/L	828 J	513 J	543.7	498	733.7	653	815.4	975	815.4	684
			-	June 2022 V	erification Sa	mpling Event	-		-	-	
DATE	NA								6/22/2022		
рН	SU										
BORON, TOTAL	μg/L										
CALCIUM, TOTAL	μg/L								215,000		
CHLORIDE, TOTAL	mg/L								10.0		
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L								175		
TOTAL DISSOLVED SOLIDS	mg/L								940		

NOTES:

1. Unit Abbreviations:  $\mu g/L$  - 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.

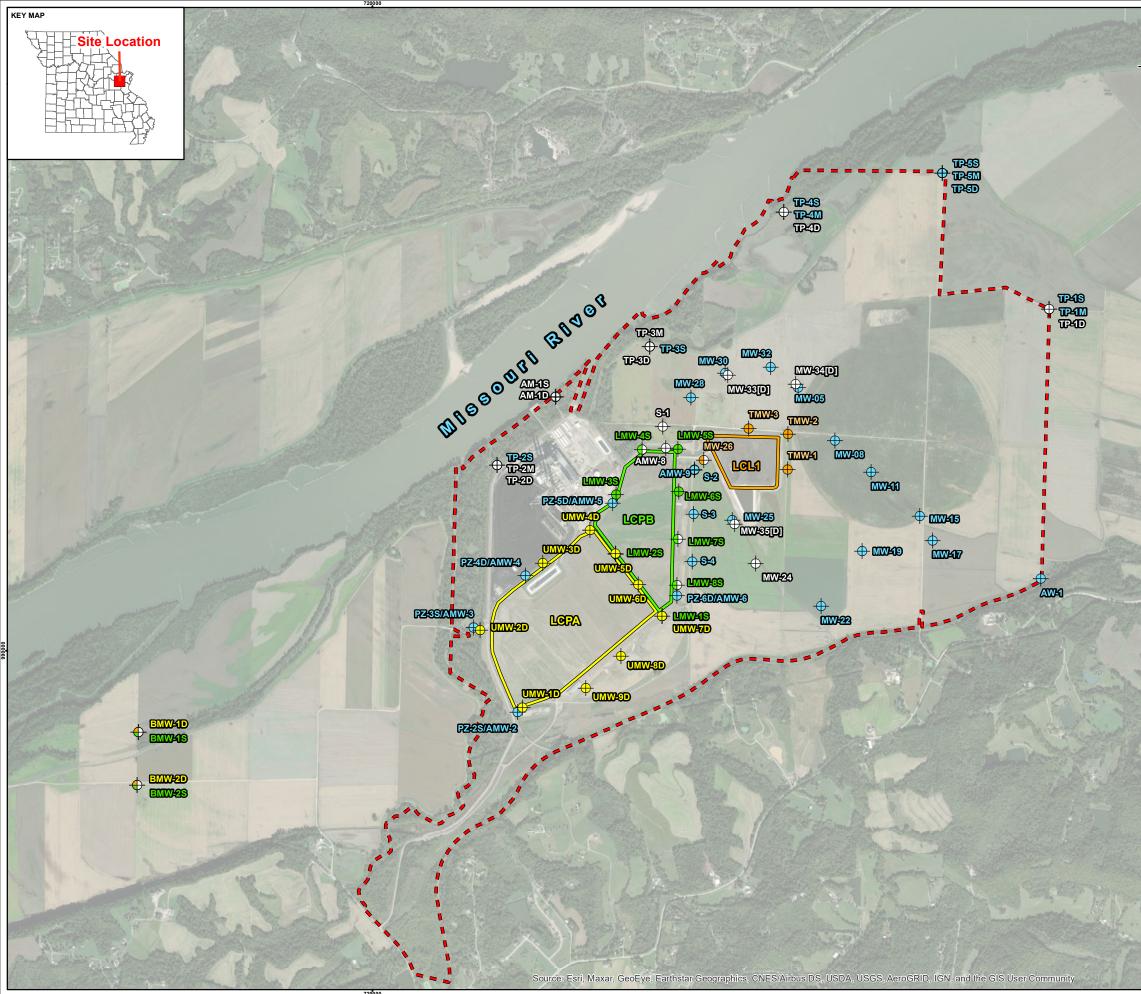
5. Prediction Limits calculated using Sanitas Software.

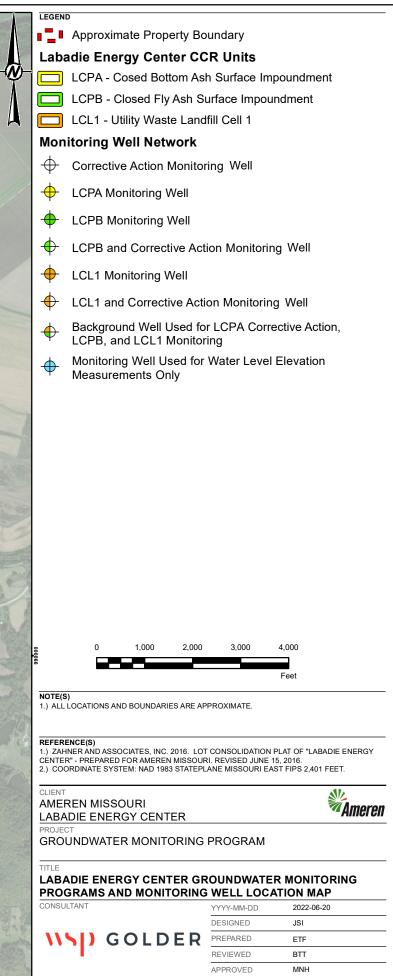
6. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).

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

Prepared By: BTT Checked By: GTM Reviewed By: MNH November 18, 2022

# Figures





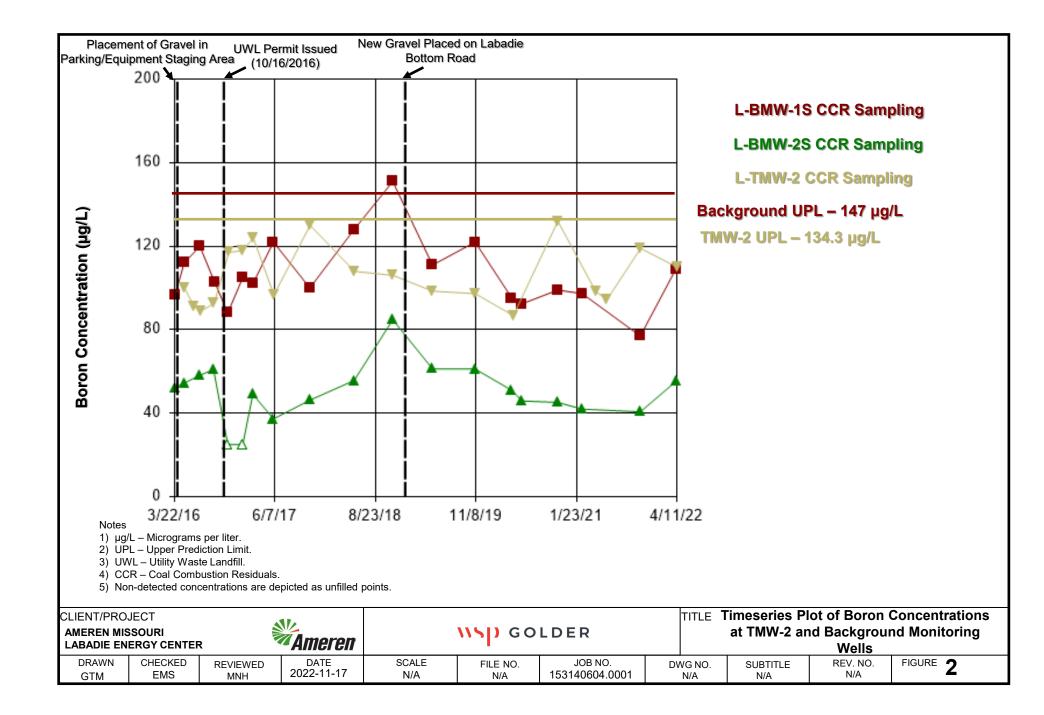
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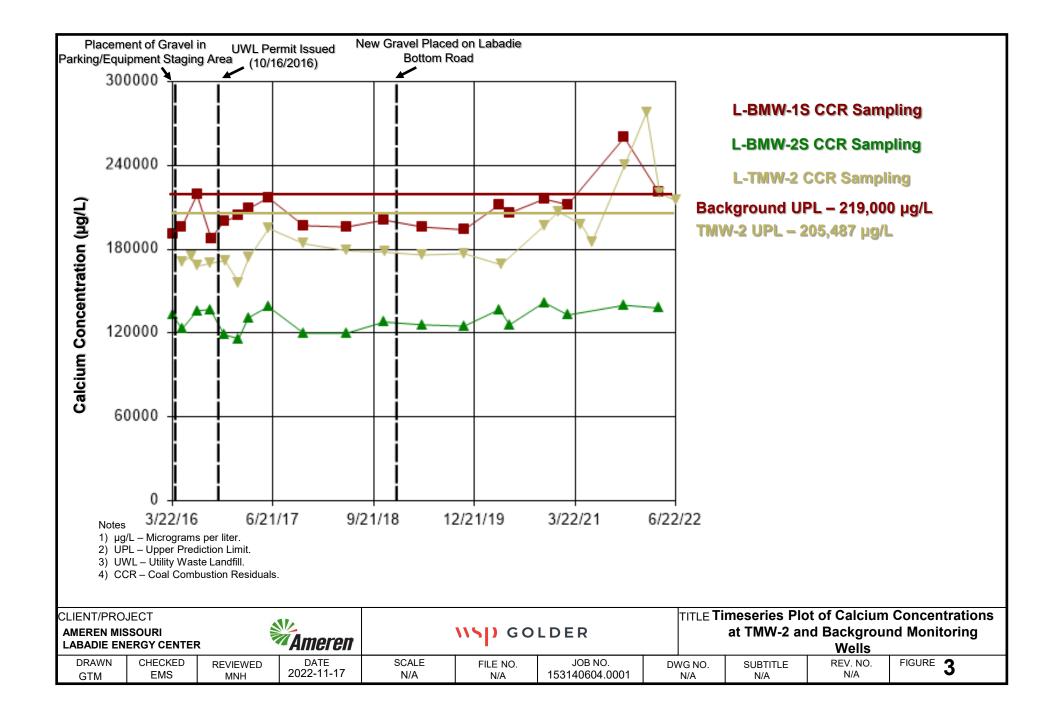
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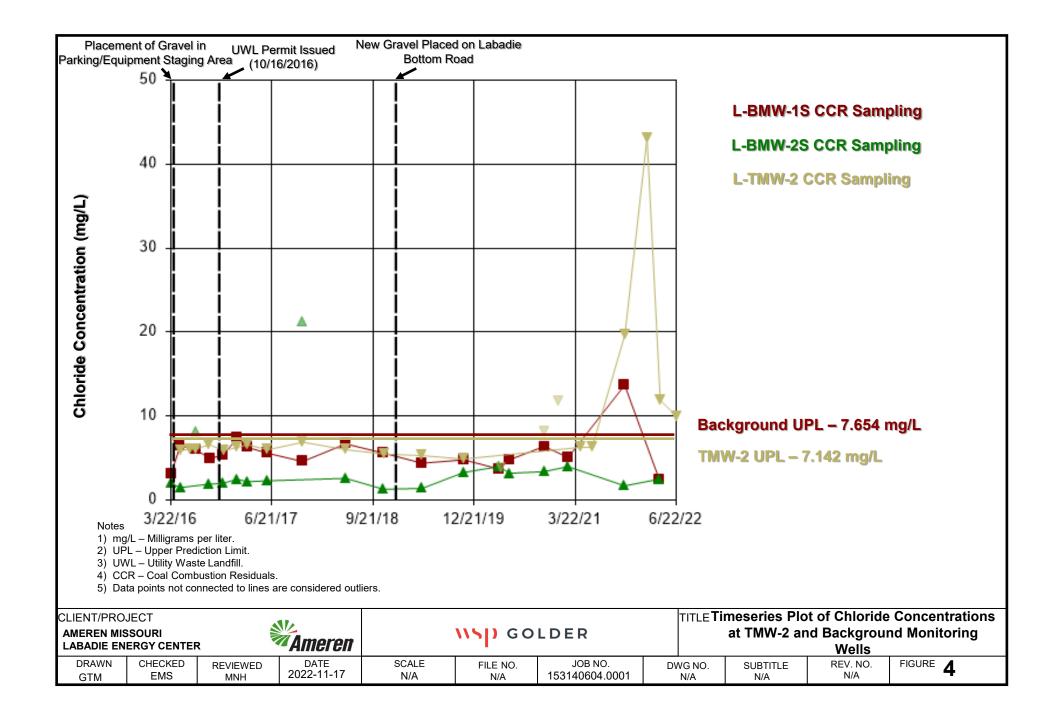
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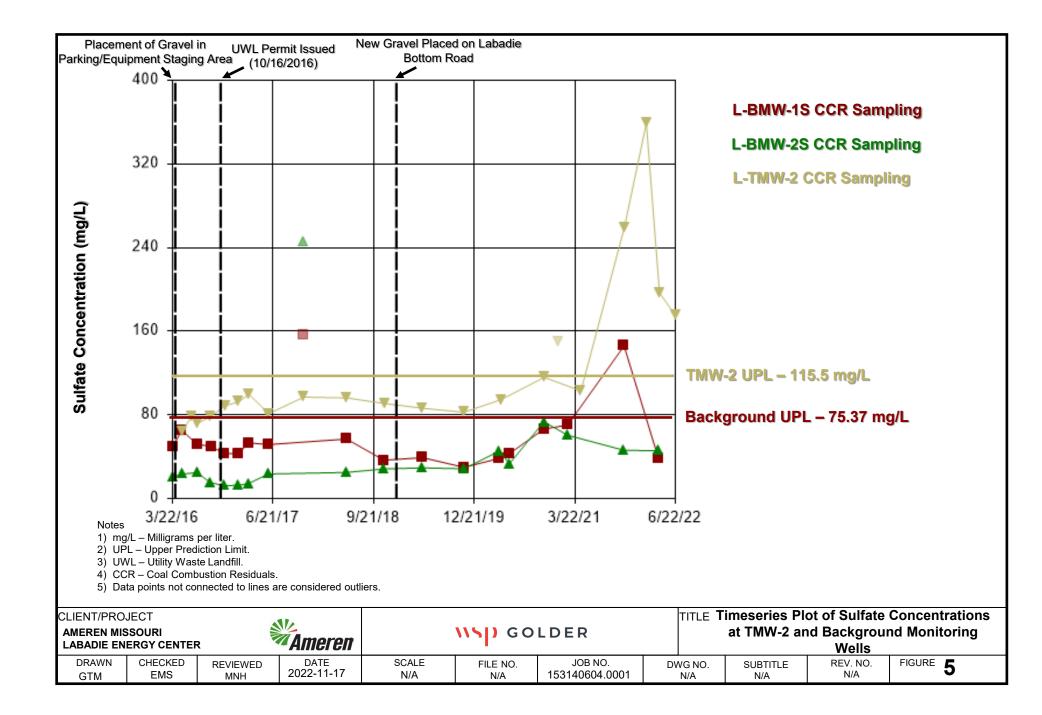
1240

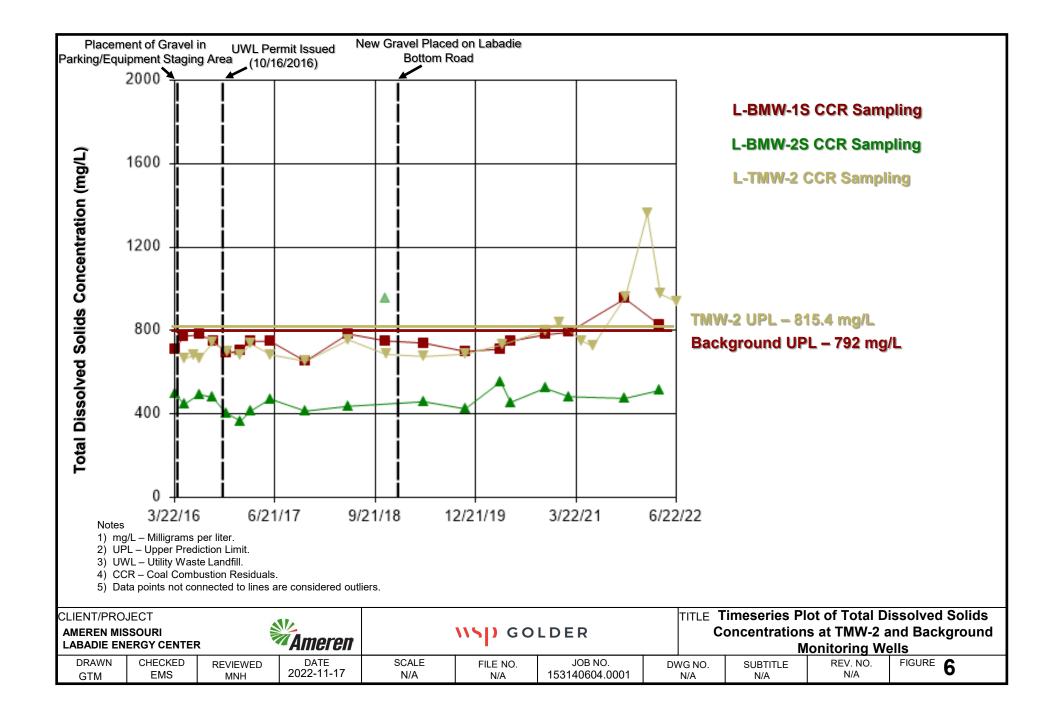
FIGURE

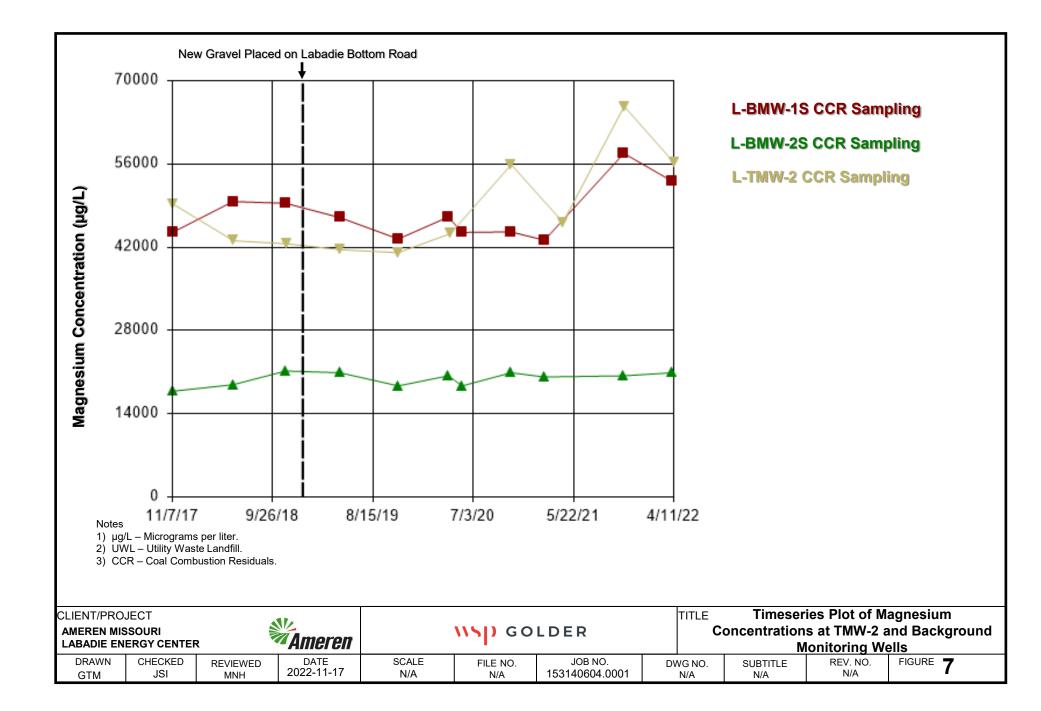


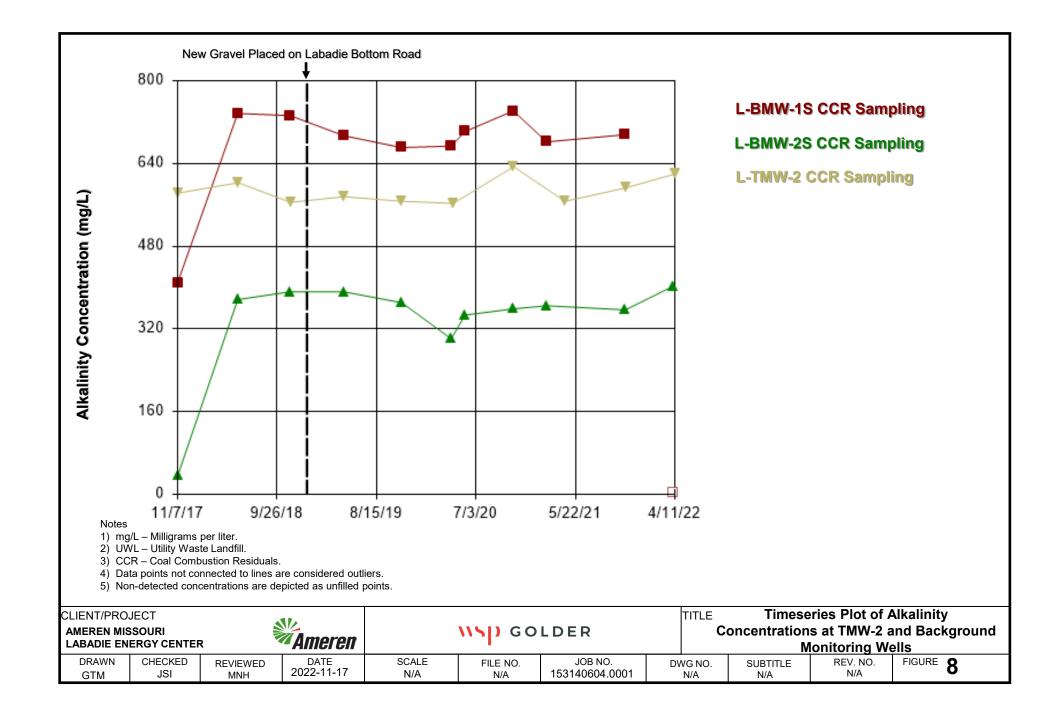


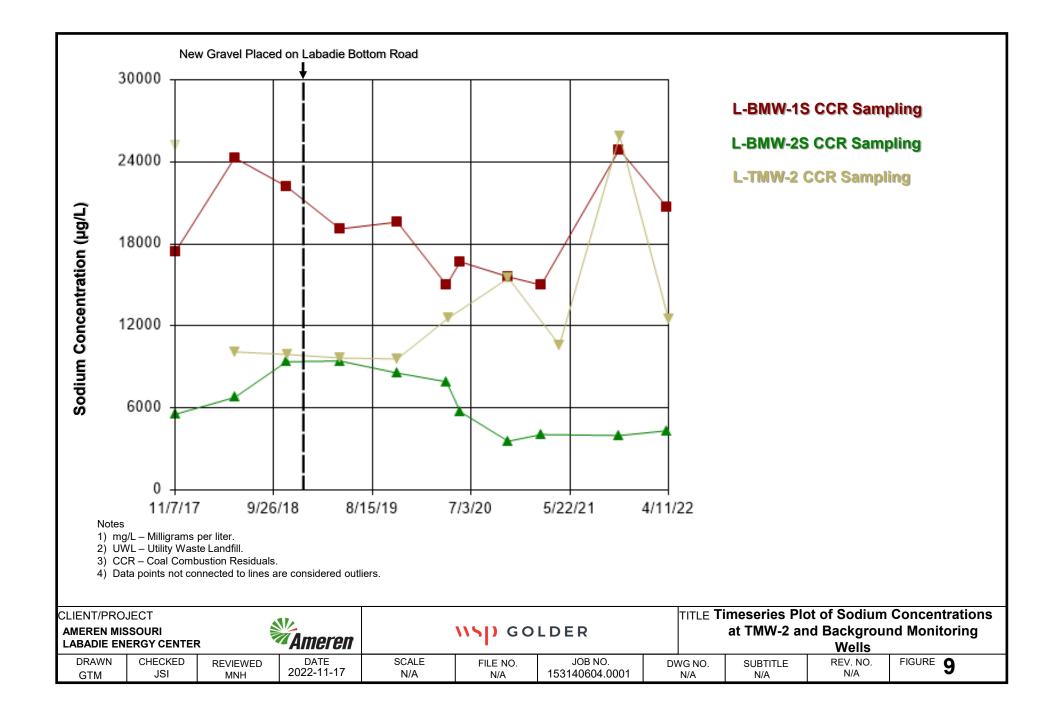


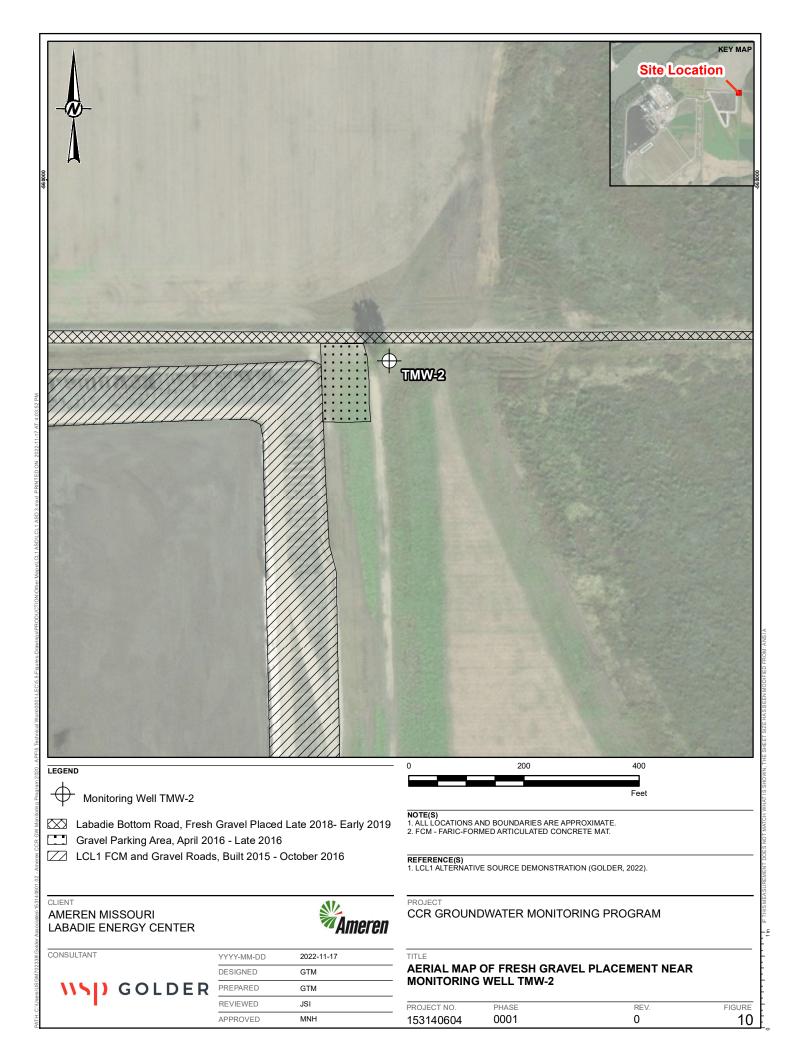






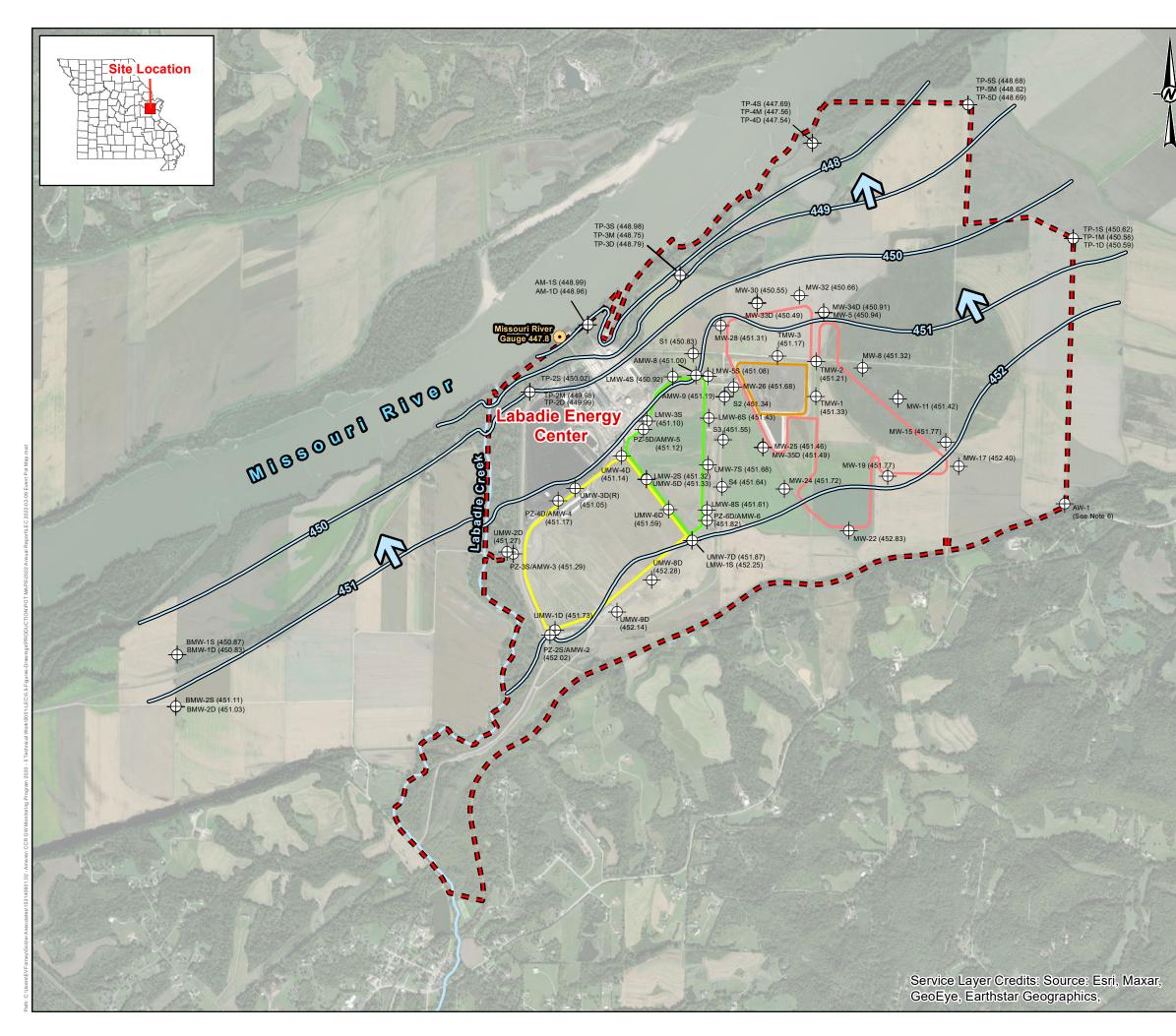




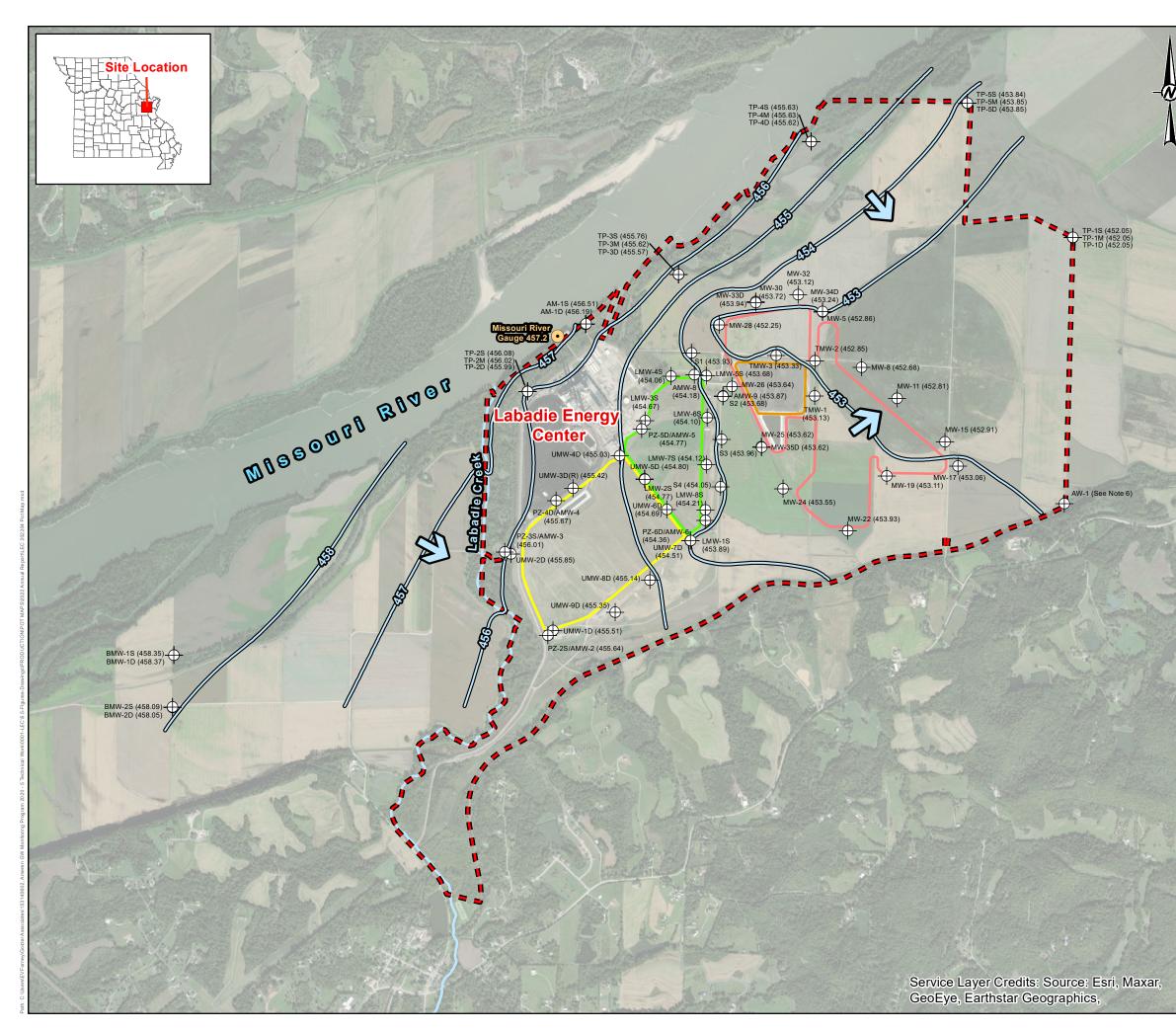


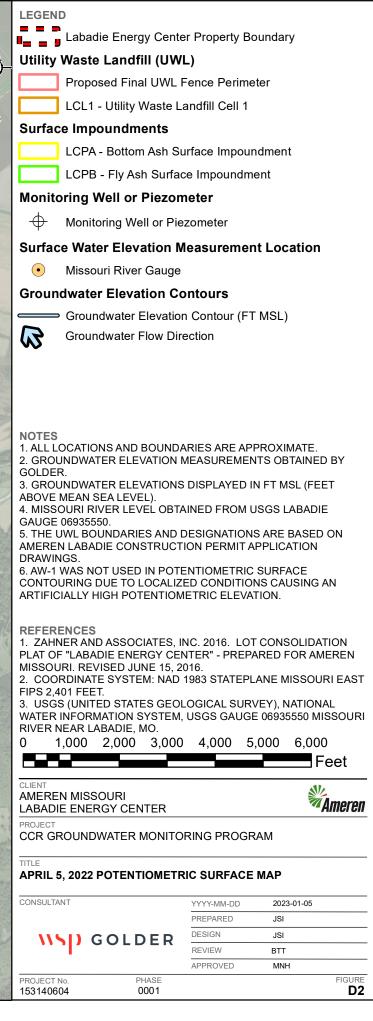
APPENDIX D

# 2022 Potentiometric Surface Maps

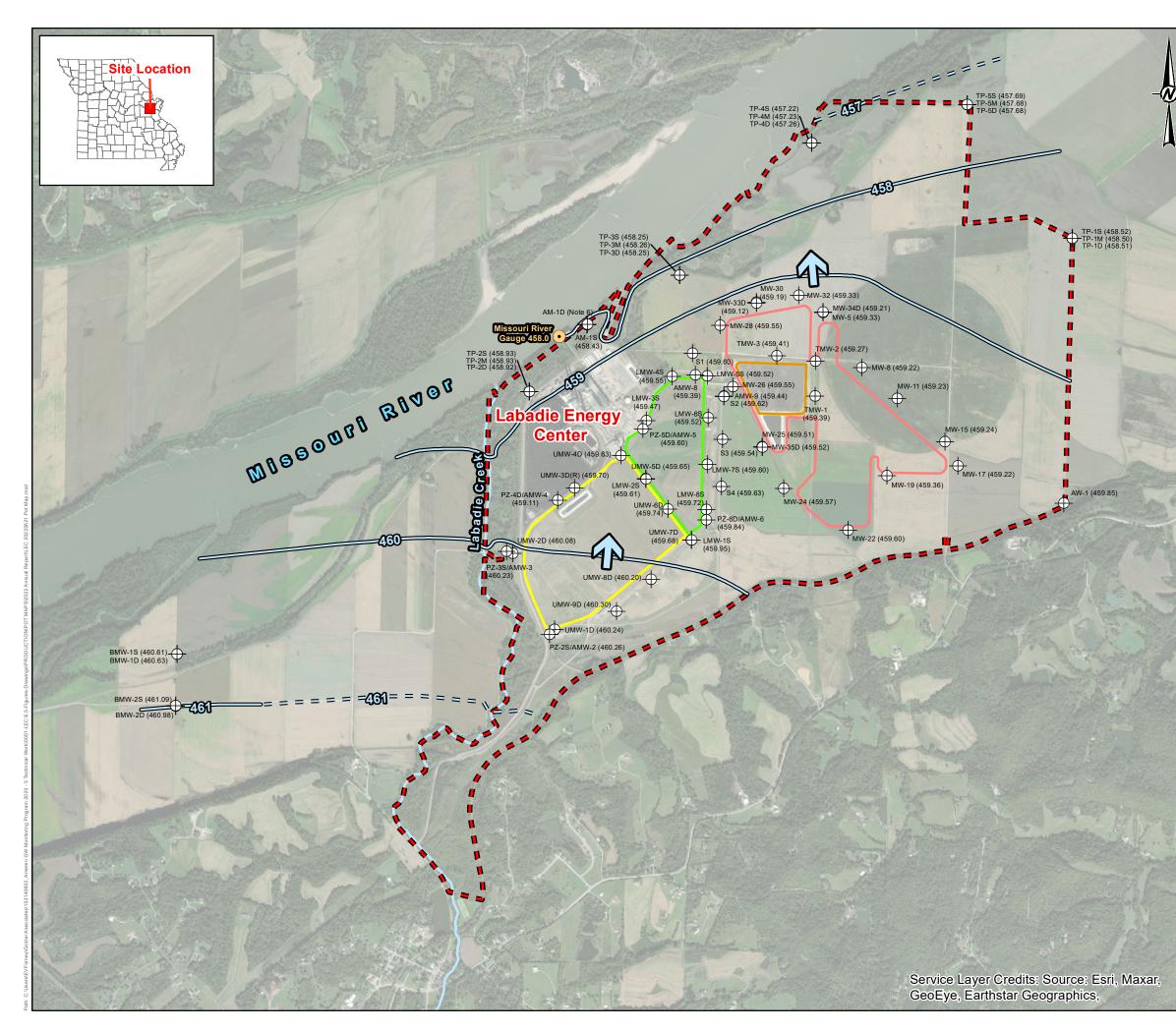


LEGEND		
Labadie Energy Cente	er Property Bo	oundary
Utility Waste Landfill (UW	L)	
Proposed Final UWL	Fence Perime	eter
LCL1 - Utility Waste L	andfill Cell 1	
Surface Impoundments		
LCPA - Bottom Ash Su	urface Impour	adment
LCPB - Fly Ash Surfac	•	
	·	ent
Monitoring Well or Piezon		
Monitoring Well or Pie	zometer	
Surface Water Elevation M	leasuremer	nt Location
Missouri River Gauge		
Groundwater Elevation Co	ontours	
Groundwater Elevation	n Contour (FT	MSL)
= = = Inferred Groundwater		
Groundwater Flow Dir		· /
vv		
NOTES 1. ALL LOCATIONS AND BOUNDA	ARIES ARE AP	PROXIMATE
2. GROUNDWATER ELEVATION I		
GOLDER. 3. GROUNDWATER ELEVATIONS	DISPLAYED I	N FT MSL (FEET
ABOVE MEAN SEA LEVEL). 4. MISSOURI RIVER LEVEL OBTA		
GAUGE 06935550.		
5. THE UWL BOUNDARIES AND I AMEREN LABADIE CONSTRUCT		
DRAWINGS. 6. AW-1 WAS NOT USED IN POTE	ENTIOMETRIC	SURFACE
CONTOURING DUE TO LOCALIZ ARTIFICIALLY HIGH POTENTION		
REFERENCES		
1. ZAHNER AND ASSOCIATES, I PLAT OF "LABADIE ENERGY CEI		
MISSOURI. REVISED JUNE 15, 2 2. COORDINATE SYSTEM: NAD		ANE MISSOURI EAS
FIPS 2,401 FEET.		
3. USGS (UNITED STATES GEO WATER INFORMATION SYSTEM,		
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CLIENT		
AMEREN MISSOURI LABADIE ENERGY CENTER		<b>Mamere</b>
PROJECT		/
CCR GROUNDWATER MONITO	RING PROGF	AM
FEBRUARY 9, 2022 POTENTIO	METRIC SUR	FACE MAP
CONSULTANT	YYYY-MM-DD	2022-12-05
	PREPARED	GTM
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	APPROVED	MNH
PROJECT No. PHASE 153140604 0001		FIGUF

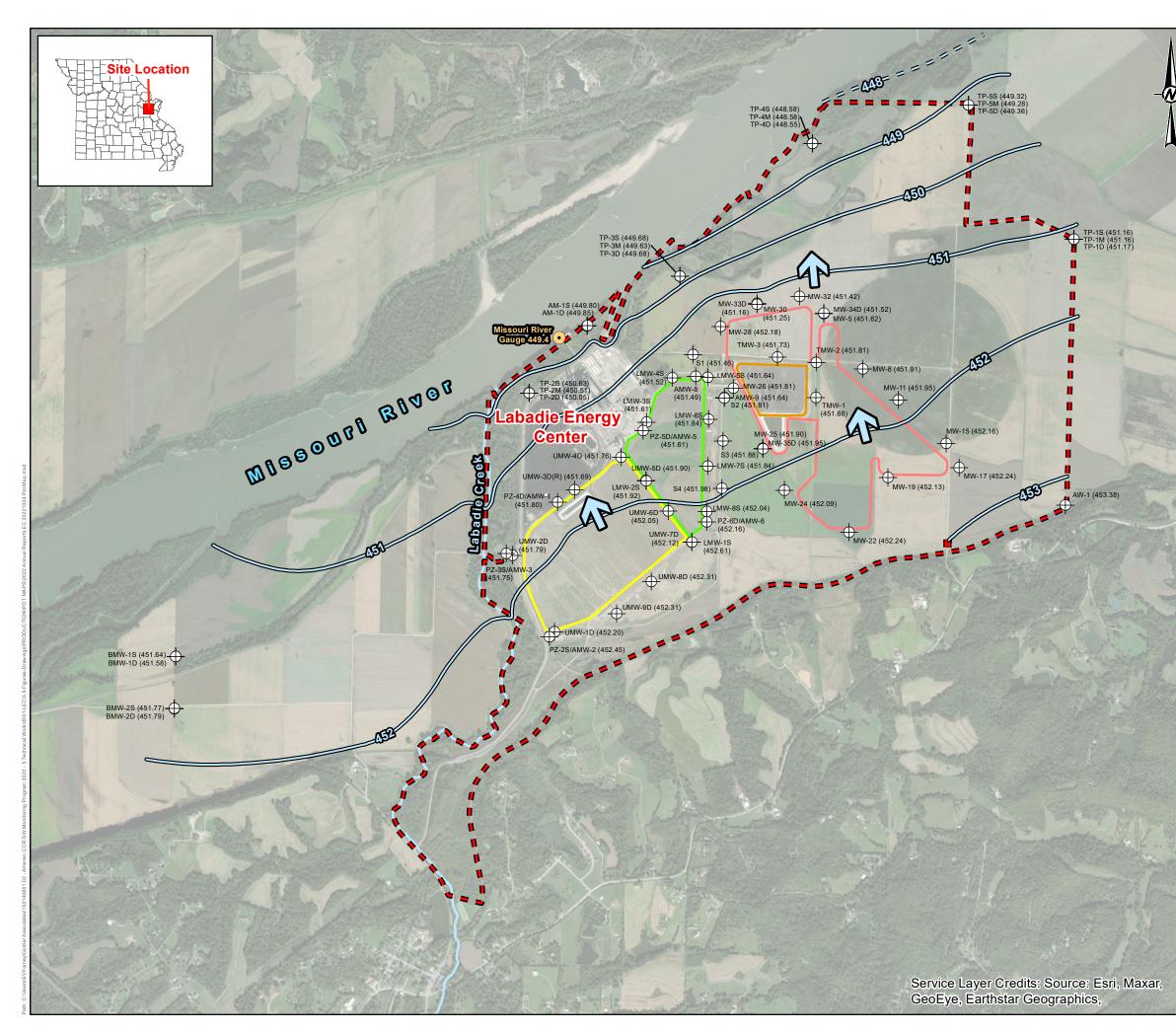




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LEGEND			
La La	badie Energy Cente	er Property	Boundary
Utility Wa	ste Landfill (UW	L)	
Pr	oposed Final UWL F	ence Perir	neter
	L1 - Utility Waste L	andfill Cell	1
Surface In	mpoundments		
	י PA - Bottom Ash Su	Irface Impo	undment
	PB - Fly Ash Surfac		
	g Well or Piezon	•	
1	onitoring Well or Pie		
т	·		
	Vater Elevation N	leasurem	ent Location
_	ssouri River Gauge		
	ater Elevation Co		
	oundwater Elevation		
	erred Groundwater		Contour (FT MSL)
Gr Gr	oundwater Flow Dire	ection	
NOTES			
	ATIONS AND BOUNDA WATER ELEVATION N		
GOLDER. 3 GROUND	WATER ELEVATIONS		) IN FT MSL (FFFT
ABOVE MEA	AN SEA LEVEL). RI RIVER LEVEL OBTA		,
GAUGE 069	35550.		
	BOUNDARIES AND E BADIE CONSTRUCT		
DRAWINGS 6. GROUND	WATER ELEVATION (	COULD NOT	BE COLLECTED
	HOURS OF OTHER EI ION AT AM-1D.	LEVATIONS	DUE TO AN
obornoor			
REFERENC			
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	REVISED JUNE 15, 2 NATE SYSTEM: NAD		PLANE MISSOURI EAST
FIPS 2,401 F 3. USGS (U	FEET. NITED STATES GEOL	OGICAL SU	RVEY). NATIONAL
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			Feet
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	NERGY CENTER		Ameren
PROJECT CCR GROU	INDWATER MONITO	RING PRO	GRAM
TITLE			
	022 POTENTIOMET		CE MAP
CONSULTANT		YYYY-MM-DD	2023-01-05
		PREPARED	ETF
<b></b>	GOLDER	DESIGN	ETF
l '		APPROVED	GTM MNH
PROJECT No. 153140604	PHASE 0001		FIGURE D3
100140004			



LEGENI	)		
╸╸╸ ╵╸╺╴╹	Labadie Energy Cen	ter Property Bo	oundary
Utility	Waste Landfill (UV	VL)	
	Proposed Final UWL	Fence Perime	ter
	LCL1 - Utility Waste	Landfill Cell 1	
Surfac	e Impoundments		
	LCPA - Bottom Ash S	Surface Impour	idment
	LCPB - Fly Ash Surfa	ace Impoundm	ent
Monito	ring Well or Piezo	meter	
$\oplus$	Monitoring Well or Pi	iezometer	
Surfac	e Water Elevation		t Location
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	Groundwater Flow Di		
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NOTES 1. ALL LO	DCATIONS AND BOUND	OARIES ARE API	PROXIMATE.
2. GROU GOLDEF	NDWATER ELEVATION	MEASUREMEN	ITS OBTAINED BY
	NDWATER ELEVATION MEAN SEA LEVEL).	IS DISPLAYED II	N FT MSL (FEET
4. MISSO	DURI RIVER LEVEL OB 06935550.	TAINED FROM U	ISGS LABADIE
5. THE U	WL BOUNDARIES AND		
DRAWIN	I LABADIE CONSTRUC GS.	TION PERMITA	PPLICATION
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	ER 24, 2022 POTENTIC		ACE MAP
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		PREPARED	

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